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TÜRK GİRİŞİMSEL RADYOLOJİ DERNEĞİ
TURKISH SOCIETY OF INTERVENTIONAL RADIOLOGY

2024 Turkish Interventional Radiology 19th Annual Meeting

2-6 February 2024

Titanic Belek Congress Center, ANTALYA

ABSTRACT BOOK



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Oncologic interventional Radiology
SB-01

BEYOND THE EMBOLIZATION FIELD: SIZE REDUCTION IN HEMANGIOMAS OUTSIDE THE TARGET ZONE IN LIPIODOL-BLEOMYCIN EMBOLIZATION OF LIVER HEMANGIOMAS

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İntroduction: Hepatic hemangioma (HH) represents a congenital vascular abnormality characterized by the presence of intricate networks of aberrant blood and/or lymphatic vessels accompanied by endothelial cell proliferation[1]. The precise pathophysiology of HH remains elusive, and there is currently no specific pharmacological treatment established for its treatment.

Herein, in cases where selective liver hemangioma embolization is performed with Lipiodol-bleomycin, a reduction in size has been observed not only within the embolization site but also in hemangiomas outside the embolization field.

Material&Method: Patients with at least one giant liver hemangioma, along with multiple hemangiomas, were included in the study. A total of 18 patients meeting these criteria and undergoing with TACE using a mixture of bleomycin-lipiodol between 2009 to 2019 were included in this study. The collected data included sex, age, size of the tumor, number of tumor, location of hemangioma, reduction rate in the target mass and non-target mass, times of TAE, complications, period of follow-up, long-term result, and whether or not surgery was finally performed. Statistical analysis was performed using SPSS version 16.0, the reduction in lesions was compared using the Wilcoxon Signed Ranks Test with SPSS software.

Results: 18 patients (14 [77.8%] female; 4 [22.2%] male) were statistically investigated. The mean age was 49.1±9.2 years. The most common symptom was abdominal pain(55.6%), followed by nausea (16.7%). Post-TACE mean follow-up was 63.1 months. The average size of liver hemangioma was 12.1±4.2 cm. Mean volume was 952.9 cm^3 (49.8- 3307.0 cm^3) and 120.4 cm^3 (3.0-660.0 cm^3) before and after TACE respectively. Treatment sessions were administered between 1 and 3. The median volume value of the non-target lesion was 12,500 mm^3 before embolization and decreased to 1216 mm^3 after embolization. There was a statistically significant reduction in both volume. There was no major complication.

Conclusion: Transarterial chemoembolization with a mixture of bleomycin and lipiodol is a safe method due to the low complication rate. Bleomycin, known for its cytotoxic, antiangiogenic, and sclerosing effects, has been used for the treatment of vascular anomalies. It induces DNA degradationand an inflammatory response around the lesion [2]. It is understood that, in addition to the local effects of Lipiodol-Bleomycin, their systemic effects are also effective in non-target lesions.

Keywords : Liver, giant hemangioma, bleomycin, lipiodol, transarterial chemoembolization, non-target lesion

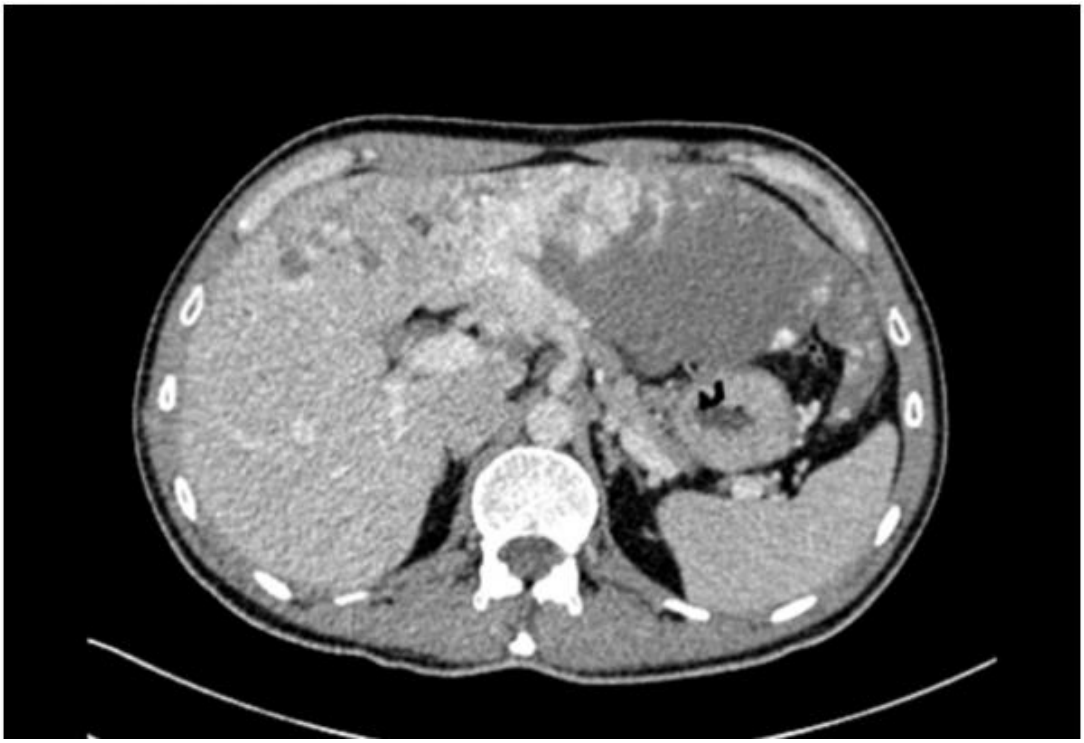
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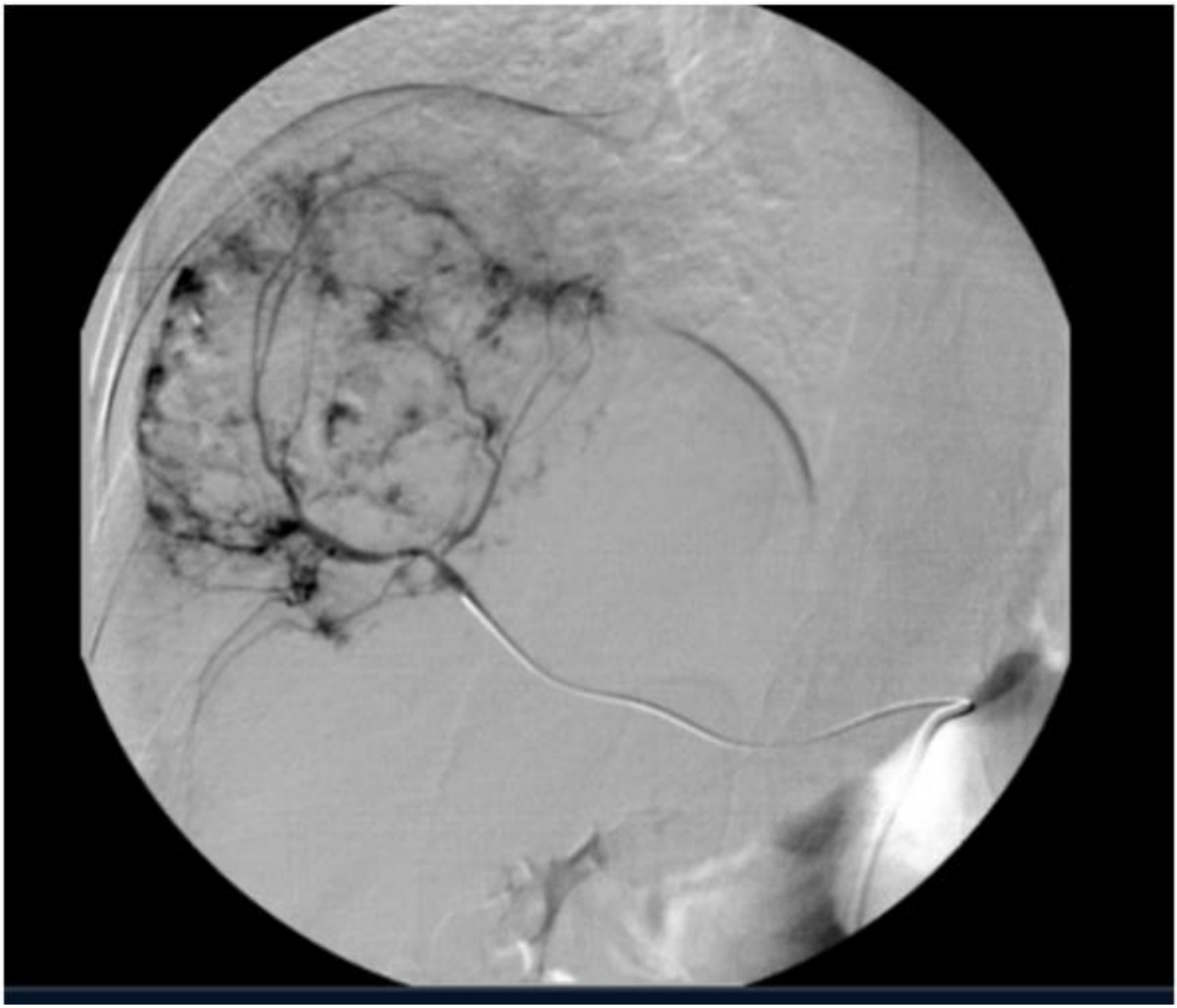
Description of the Figure: Figure 1. Liver left lobe hemangioma



Description of the Figure: Figure 2. Liver left lobe hemangioma after embolization



Description of the Figure: Figure 3. Embolization of the hemangioma with a microcatheter



Oncologic interventional Radiology
SB-02

EARLY RESULTS OF TREATMENT EFFICACY AND SAFETY IN PATIENTS DIAGNOSED WITH PRIMARY HYPERPARATHYROIDISM WHO RECEIVED RADIOFREQUENCY OR MICROWAVE ABLATION THERAPY, KTU FACULTY OF MEDICINE EXPERIENCE

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Objective: The aim of the study is to reveal the efficacy and safety of RFA or MWA treatment in symptomatic patients diagnosed with PHH.

Materials and Methods: In our hospital, RFA and MWA were performed on patients diagnosed with PHPT clinically, laboratorially and ultrasonographically in the endocrinology outpatient clinic between 2017 and 2023. The cure rate was defined as serum calcium and PTH decreasing to normal values for more than 6 months after ablation.

Results: A total of 88 patients (age range 35-83, average age 61 years) diagnosed with primary hyperparathyroidism were included in the study. US-guided MWA and RFA were performed on 92 parathyroid adenomas detected in patients. RFA was performed in 50 of the patients and MWA was performed in 36 of the patients. The technique success rate was 98.9% (87/88). The follow-up period was 3-12 months. Considering the calcium value, the cure rate was 88% in 6 months, and 60% when Calcium and PTH values were taken together. (Odds ratio (OR), 0.21; 93% CI, 0.07-0.69; p = 0.001).

No major complication such as permanent hoarseness (0%) was detected. Temporary hoarseness was observed in three cases (3.4%).

Conclusion: US-guided MWA and RFA is a minimally invasive, effective and safe procedure in the treatment of PHPT patients. In the study, serum calcium levels were found to be more predictive of treatment effectiveness than PTH.

Keywords : Primary Hyperparathyroidism, Parathyroid adenoma, RFA, MWA

Oncologic interventional Radiology
SB-03

EFFECT OF PERCUTANEOUS ENDOBILIARY RADIOFREQUENCY ABLATION IN UNRESECTABLE KLATSKIN TUMOR

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Purpose: The life expectancy of unresectable klatskin tumors (UKT) is very limited.The aim of this study is to determine the efficacy of Percutaneous Endobiliary Radiofrequency Ablation **(**PEB-RFA) on stent patency and survival in the palliative treatment of klatskin tumors (UKT).

Materials and Methods: In this two-center retrospective study, between January 2015 and September 2023, 50 patients with malignant biliary obstruction secondary to UKT were included in our study. The patients were divided into two groups as those who received PEB-RFA treatment and those who did not. Initially, percutaneous transhepatic biliary drainage procedure was applied to all patients. PEB-RFA catheter was placed over the wire in 25 patients and multisegment ablation was performed for 2 minutes. Self-expandable metallic stent was used after ablation and It was dilated with appropriate balloon. Biliary drainage catheter was placed. Endobiliary stenting and balloon dilatation were applied to 25 patients in the other group without PEB-RFA. After the procedure, controls were made at the 1st week, 1st, 3rd, 6th months and every 6 months. Procedure-related complications, stent patency, and survival after treatment were investigated.

Results: Metal stent placement was successful in all patients without any technical problems; the technical success rate was 100%. In the follow-up, bilirubin levels decreased to normal limits in the first month. Clinical success was 96%. The cumulative median overall survival was 125 (25-442) days in the PEB-RFA group and 85 (14-253) days in the no PEB-RFA group. In the PEB-RFA group, 1 patient (4%) developed sudden growth after 4 months of follow-up. During follow-up, regrowth developed in 7 patients (28%) in the non-EB-RFA group. Instent EB-RFA and restentation were performed. No acute pancreatitis, bile duct bleeding and perforation, bile leakage, or other severe complications occurred in both group.

Four cases of procedure-related cholangitis, 12 cases of postoperative abdominal pain, and six cases of asymptomatic transient increase in serum amylase were observed in the PEB-RFA group and five cases of procedure-related cholangitis, 12 cases of postoperative abdominal pain, and five cases of asymptomatic transient increase in serum amylase were observed in the PEB-RFA group. No direct death detected with EB-RFA. Stent patency and median overall survival were significantly different from the control group ($p < 0.05$) Complication rates were similar ($p > 0.05$)

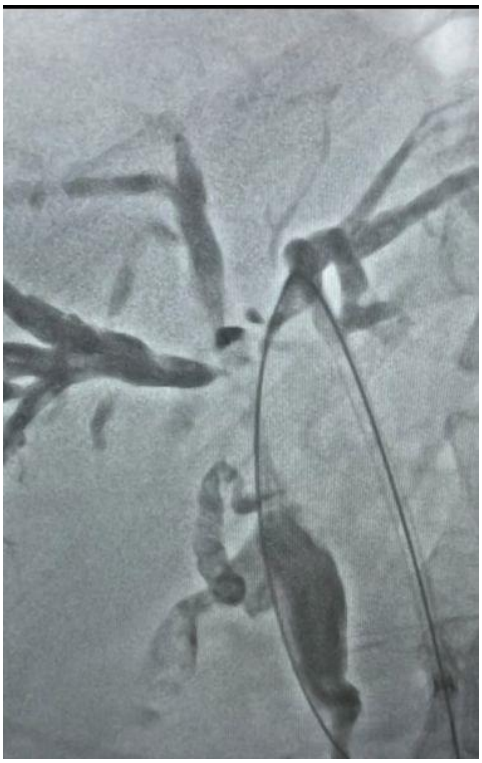
Conclusion: PEB-RFA is a safe and effective method of prolonging stent patency by creating a limited ablation zone of tumor burden in and around the biliary tract and PEB-RFA has early positive effect on stent patency and overall survival in patients with UKT.

Although it turned out to significantly inhibit immediate regrowth, raandomized and controlled studies with more patient series are needed to evaluate long-term patency.

Keywords : Endobiliary Radiofrequency Ablation, Klatskin Tumor

Figure :

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Oncologic interventional Radiology
SB-04

IMPACT OF BODY COMPOSITION PARAMETERS ON TUMOR RESPONSE AND SURVIVAL IN PATIENTS WITH HEPATOCELLULAR CARCINOMA UNDERGOING INTRA ARTERIAL TREATMENTS

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Purpose: To evaluate the prognostic value of body composition parameters (sarcopenia, myosteatosis, subcutaneous and visceral fat tissue index increase) and their changes after intra arterial therapies on tumor response and survival in hepatocellular cancer (HCC) patients who received intraarterial treatment.

Materials and Methods: A total of 160 HCC patients (123 male, 37 female) treated between January 2012-December 2022 were included in this retrospective study. Skeletal muscle area, skeletal muscle density, subcutaneous fat tissue area and visceral fat tissue area were measured at the L3 vertebra level on patients' CT scans. Patients were divided into sarcopenic/non sarcopenic group, myosteatotic/non myosteatotic group by using cut off values defined in the literature adjusted accordingly to body mass index and gender. For subcutaneous and visceral fat areas cut off values were determined by using the median values of the cohort. Treatment outcomes were measured with mRECIST criteria on follow up imaging. Overal survival (OS), progression free survival (PFS) in months (mo), objective response rate (ORR), an local disease control rate (LDCR) and relations with these parameters with pre and post procedure body compositions values were evaluated with Chi-square test, univariate and multivariate Cox regressions analysis, Kaplan-Meier survival analysis. A p value of <0.05 was chosen for statistical significance.

Results: The LDCR was 77.7% and the ORR was 55.4% at first follow up imaging. No difference was observed in terms of treatment outcomes between groups. Factors affecting ORR were male gender (odds ratio:0.30, 95% CI:0.11-0.81, p=0.017), ECOG score (odds ratio: 0.26, 95% CI: 0.08-0.89, p=0.032), AFP level (odds ratio:0.36, 95% CI:0.16-0.81, p=0.014) and ALBI score (odds ratio:7.23, 95% CI: 0.76-68.61, p=0.085). The median OS and PFS were shorter in the sarcopenic group than the nonsarcopenic group and were statistically significant (OS:18.61±3.82 mo, PFS: 9.91±2.30 mo vs OS: 43.26±5.59 mo, PFS: 31.52±5.16 mo). The myosteatotic group also showed statictically significant shorter OS and PFS times than the non-myosteatotic group (OS:16.29±2.39 mo, PFS:13.27 2.81 mo vs OS: 51.31±6.84 mo, PFS: 35.84±6.43 mo). A decrease in skeletal muscle index on follow up imaging was correlated with shorter PFS and OS times. Factors affecting OS were the presence of previous treatment (HR: 0.51, 95% CI: 0.31-0.84, p=0.009), Child stage (p=0.004), albumin level (HR=1.56, 95% CI=1.06-2.31, p=0.024), AFP level (HR:1.83, 95% CI=1.22-2.75, p=0.003), sarcopenia (HR=1.59, 95% CI=1.05- 2.41, p=0.029), myosteatosis (HR=1.96, 95% CI=1.32-2.92, p=0.001) and decreased skeletal muscle index on folllow up (HR=2.13, 95% CI=1.41-3.22, p<0.001).

Conclusion: Baseline sarcopenia and myosteatosis are one of the factors affecting the PFS and OS in HCC patients. In addition, the decrease in skeletal muscle index in control examinations negatively affects prognosis.

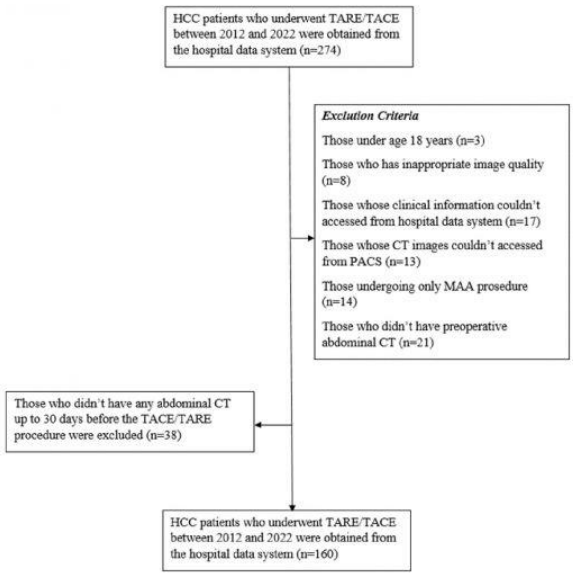
Keywords : Hepatocellular Cancer, Prognostic Factors, Sarcopenia, Myosteatosis

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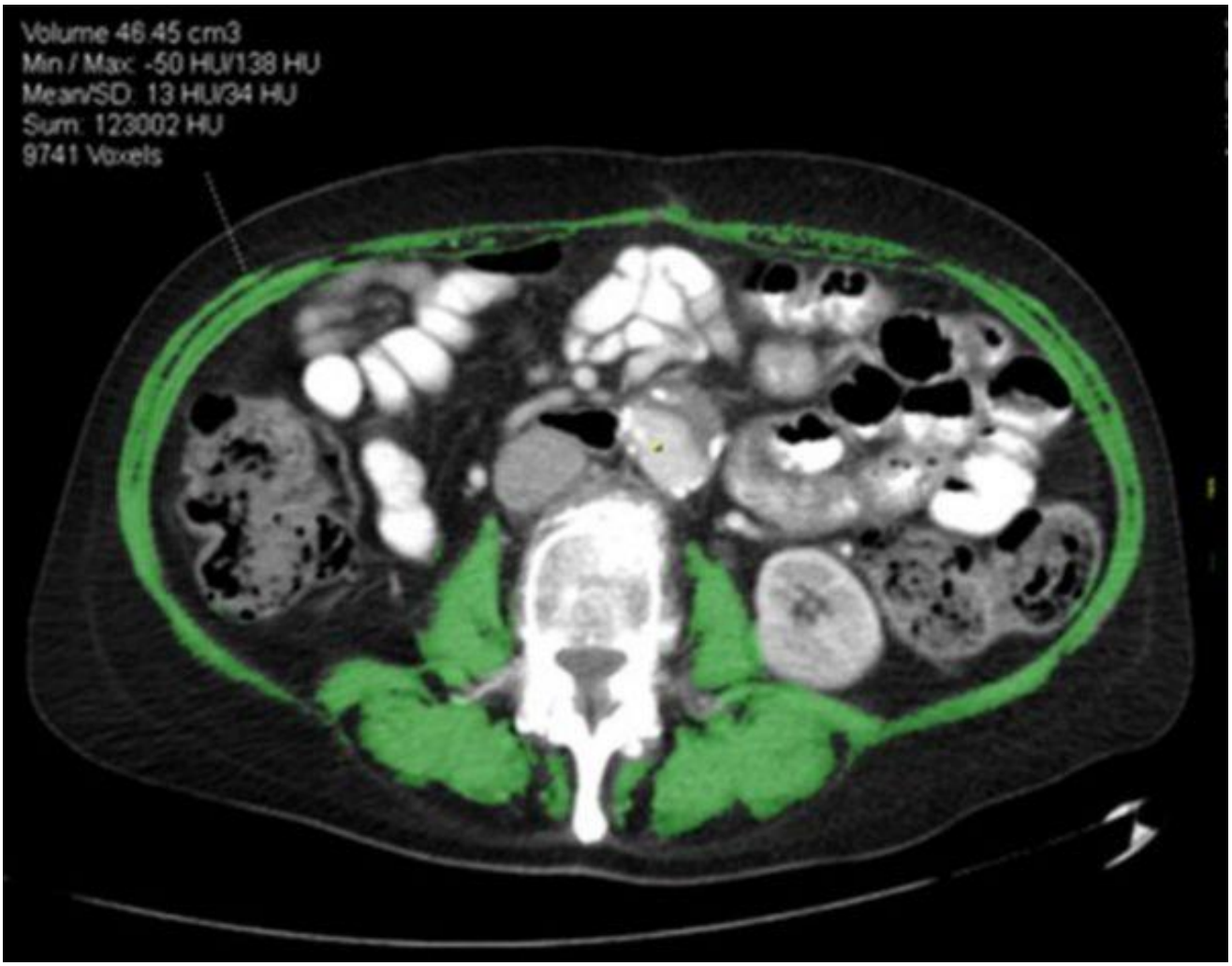
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Figure :

Description of the Figure: Flowcart of the study



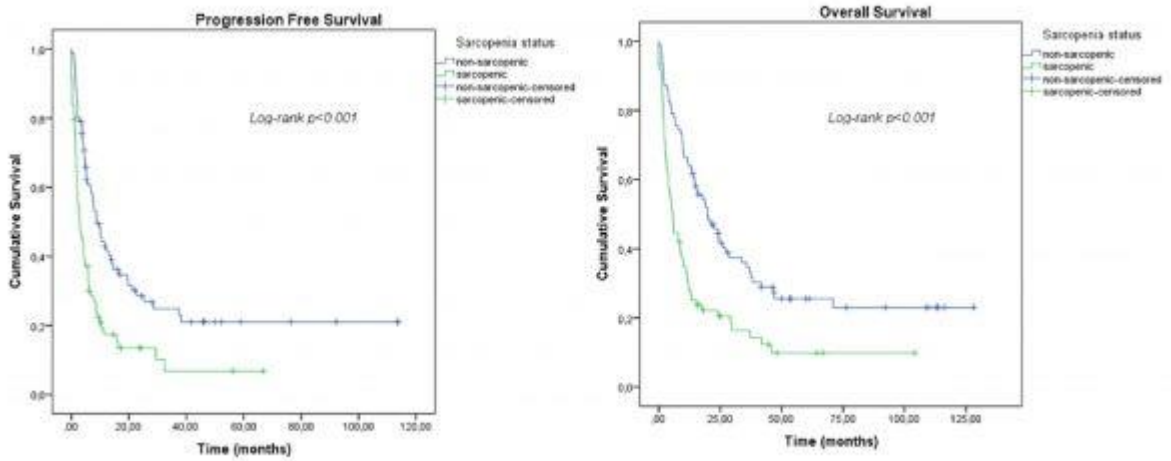
Description of the Figure: 67-year-old female patient with HCC. Abdominal CT scan measurements consisted with sarcopenia and myosteatosis.



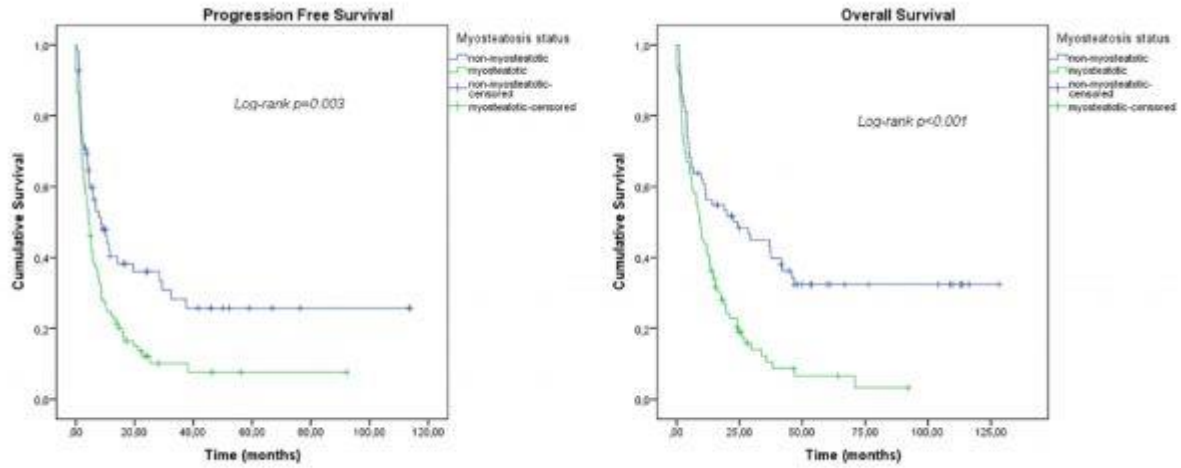
Description of the Figure: 72-year-old male patient with HCC. Abdominal CT scan revealed increased subcutaneous (a) and visceral (b) fat tissue although skeletal muscle index (c) and density (c) were normal.



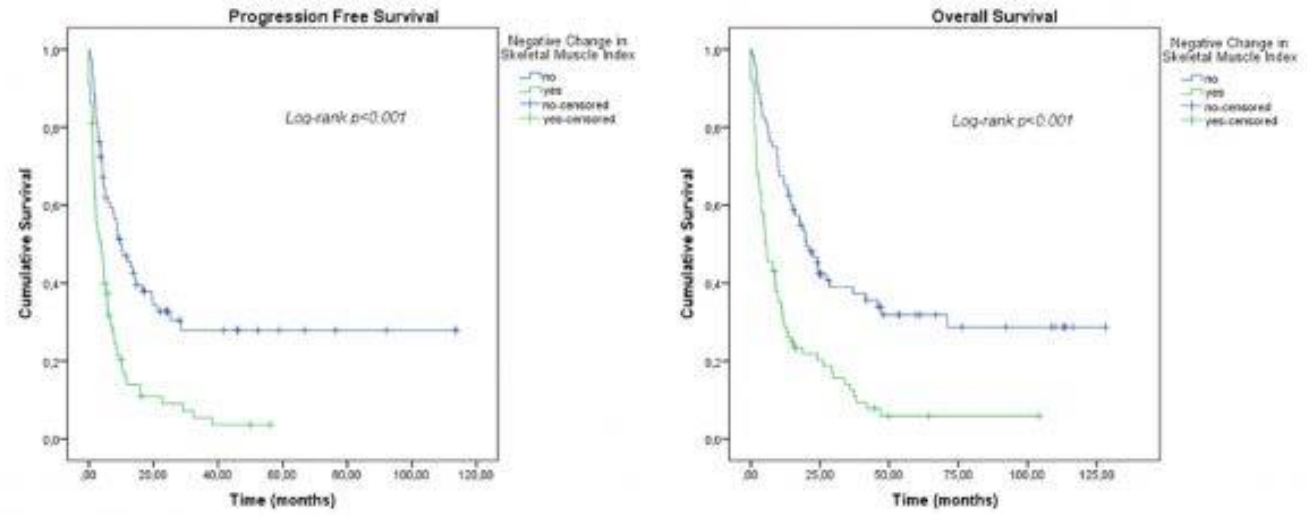
Description of the Figure: Kaplan-Meier curves of PFS and OS of sarcopenic and non-sarcopenic groups.



Description of the Figure: Kaplan-Meier curves of PFS and OS of myosteatotic and non-myosteatotic groups



Description of the Figure: Kaplan-Meier curves of PFS and OS according to skeletal muscle index change.



Tables:

Table 1. Relationship between treatment outcomes and body composition parameter groups.

	Local Disease Control Rate (%)	p-value	Objective Response Rate (%)	p-value
Sarcopenic vs. Non-sarcopenic	70.7/81.8	0.144	51.3/56.1	0.386
Myosteatotic vs. Non-myosteatotic	76.5/78.8	0.967	52.5/57.8	0.816
Visceral Obesity vs. Non-Visceral Obesity	74.5/78.9	0.659	53.4/57.2	0.544
Subcutaneous Obesity vs Non-subcutaneous Obesity	75.8/78.4	0.832	46.8/58.1	0.208

Table 2. Multivariate logistic regression analysis of factors affecting LDCR and ORR

	Local Disease Control Rate			Objective Response Rate		
Variables	Odds Ratio	Confidence Interval (95%)	p-value	Odds Ratio	Confidence Interval (95%)	p-value
Gender (M/F)	-	-	-	0.30	0.11-0.81	0.017
ECOG Score (2-3/0-1)	0.12	0.03-0.41	0.001	0.26	0.08-0.89	0.032
AFP (≥400 ng/mL/<400 ng/mL)	0.42	0.16-1.08	0.073	0.36	0.16-0.81	0.014
ALBI Score (3/1-2)	-	-	-	7.23	0.76-68.61	0.085
INR (1.1	0.19	0.06-0.57	0.003	-	-	-

Table 3. Multivariate Cox Regression Analysis of factors affecting progression free survival and overall survival.

		Progression Free Survival			Overall Survival		
Variables		Hazard Ratio	Confidence Interval (95%)	p-value	Hazard Ratio	Confidence Interval (95%)	p-value
Previous treatment	(Yes/No)	0.62	0.37-1.02	0.060	0.51	0.31-0.84	0.009
Child-Pugh Class	A(Reference)			0.004			0.004
	B/A	0.92	0.54-1.55	0.756	0.73	0.42-1.28	0.276
	C/A	13.87	2.85-67.59	0.001	13.88	2.56-75.35	0.002
Albumin	(Low/Normal)	-	-	-	1.56	1.06-2.31	0.024
AFP	(>400/<400)	1.48	1.00-2.17	0.046	1.83	1.22-2.75	0.003
Sarcopenia	(Yes/No)	1.57	1.05-2.34	0.028	1.59	1.05-2.41	0.029
Negative Change in Skeletal Muscle Index	(Yes/No)	1.99	1.39-2.97	0.001	2.13	1.41-3.22	<0.001
Myosteatosis	(Yes/No)	1.59	1.09-2.33	0.016	1.96	1.32-2.92	0.001

Oncologic interventional Radiology
SB-05

YTTRIUM-90 TRANSARTERIAL RADIOEMBOLIZATION IN INOPERABLE INTRAHEPATIC CHOLANGIOCARCINOMA: A SINGLE-CENTER RETROSPECTIVE STUDY

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[1]Cukurova Unıversıty Medıcal School Radıology Department

Purpose: Transarterial radioembolization [TARE] is a treatment options for intrahepatic cholangiocarcinoma [IHCC]. The purpose of this retrospective study was to investigate outcomes in patients with inoperable IHCC treated by TARE.

Material and Methods: Eighty-nine consecutive IHCC patients [mean age 59.8 ± 11.2 years, 59.0% females, tumor size 9.3 ± 4.1 cm, number of tumors 3.2 ± 3.8] treated by TARE between August 2015 and February 2023 were included in the study. One hundred thirty-nine [median 1, range 1 - 6] procedures were performed with mean absorbed tumor dose 329.0 ± 207.6 Gy [range 51.0 - 1120.0] using resin [84.9%] or glass [15.1%] microspheres. Primary outcome was overall survival [OS], while overall time-to-progression [OTTP] and intrahepatic time-to-progression [IHTTP] were chosen as secondary outcomes. Kaplan-Meier method and log-rank test were performed for survival analysis. *P* value <0.05 was considered for statistical significance.

Results: Following TARE, post-embolization syndrome developed in all patients, and intrahepatic bile duct dilatation with clinically significant cholestasis developed in one patient [1.12%]. During follow-up period, 30.3% of the patients received additional locoregional treatment due to developing intrahepatic metastases. Mean and maximum follow-up duration were 13.3 ± 8.7 and 60.0 months with death rate 87.6% and median overall survival time 11.0 [95% CI 8.3 - 13.6] months. Median OS was significantly longer [*P* = 0.009] in males [median 13.0 months, 95%CI 7.3 - 18.6] compared to females [median OS 10.0 months, 95% CI 7.5 - 12.4], and in patients under 65 years of age [*P* = 0.016] [median OS 13.0 months, 95% CI 9.1 - 16.8] compared to those over 65 years old [median OS 9.0 months, 95% CI 6.3 - 11.6]. In the entire population, median OTTP was 3.0 months [95% CI 2.5 - 3.4]. OTTP was significantly longer in patients under 65 years of age [*P* = 0.026] [median OTTP 2.5 months, 95% CI 3.0 - 3.4] and in patients with higher absorbed tumor dose [*P* < 0.000]. No significant influence of the tumor number [*P* = 0.704], tumor size [*P* = 0.260], number of TARE [*P* = 0.483], additional locoregional treatment [*P* = 0.497], or sex [*P* = 0.900] on OTTP was detected. In the entire population, median IHTTP was 6.0 months [95%CI 4.5 - 7.4], and was significantly longer in patients under 65 years of age [P < 0.000], in patients with higher absorbed tumor dose [*P* = 0.024], and in those who had more than one treatment session [*P* = 0.007]. No significant effect of the tumor number [*P* = 0.312], tumor size [*P* = 0.624], additional locoregional treatment [*P* = 0.268], or sex [*P* = 0.545] on IHTTP duration was detected.

Conclusion: TARE is a safe option for patients with unresectable IHCC. Age under 65, male sex, multiple sessions, and high absorbed tumor dose appear to be factors that prolong OS, OTTP, and IHTTP.

Keywords : TRANSARTERIAL RADIOEMBOLIZATION, YTTRIUM-90, INTRAHEPATIC CHOLANGIOCARCINOMA

Oncologic interventional Radiology
SB-06

TRANSARTERIAL YTTRIUM-90 RADIOEMBOLIZATION IN UNRESECTABLE HEPATOCELLULAR CARCINOMA: TEN-YEAR SINGLE-CENTER REAL-LIFE EXPERIENCE

HUSEYIN TUGSAN BALLI[1], KAIRGELDY AIKIMBAEV[1], FERHAT CAN PISKIN[1], MERT GUL[1], BEGUM GUZEL[1], BERKAY DIK[1]
[1]Cukurova Unıversıty Medıcal School Radıology Department

Purpose: Transarterial radioembolization [TARE] is a widely accepted treatment option for hepatocellular carcinoma [HCC]. The aim of this retrospective study was to report the outcomes of patients with inoperable HCC treated by TARE at a single center for a long period.

Material and methods: Two hundred fifty-one consecutive HCC patients treated by TARE between October 2013 and February 2023 were retrospectively evaluated. Primary outcome was overall survival [OS], hepatic time-to-progression [HTTP] and objective response rate [ORR], defined as the sum of complete and partial responses, were chosen as secondary outcomes. Following the Normality tests, Kaplan-Meier method and log-rank test were performed for survival analysis. *P* value <0.05 was considered for statistical significance.

Results: Three hundred sixty-four [median 1, range 5] procedures [mean calculated absorbed tumor dose 218.7 ± 78.3 Gy] were performed using Yttrium-90-loaded resin [74.8%] or glass [25.2%] microspheres for patients [mean age 64.6 ± 10.1 years, 81.1% males] with mean tumor size 7.5 ± 4.1 cm and median tumor number 3 (range 11)]. Additional locoregional treatments [TARE, radiofrequency or microwave ablations] were applied in 27.4% of patients due to developed hepatic metastases or target tumor progression. Mean OS time was 16.0 ± 1.1 months [95% CI 13.8 - 18.2] and mean HTTP was 12.0 ± 2.1 months [95% CI 4.1 - 7.8]. OS durations were longer [$P < 0.000$] in patients with calculated absorbed tumor dose > 150 Gy [median 13.0 months (95% CI 11.3 - 14.8) vs median 4.0 months (95% CI 3.1 - 4.8)]. No significant effects of age [$P = 0.346$], sex [$P = 0.887$], number of TARE [$P = 0.056$], tumor size [$P = 0.057$] or tumor number [$P = 0.062$], and additional locoregional treatment [$P = 0.530$] on OS were found. Hepatic progression developed in 18.5% patients [HTTP 12.0 ± 2.1 months]. HTTP was longer in patients with multiple TARE [median 19.0 months (95% CI 3.1 - 12.2) v, 6.0 months (95% CI 3.6 - 8.3)], however, this difference was not significant [$P = 0.060$]. Prolonged HTTP were associated with tumor dose > 150 Gy [$P < 0.000$) and smaller tumor size [$P < 0.000$]. No difference in HTTP was found regarding age [$P = 0.085$], sex [$P = 0.817$], and tumor number [$P = 0.115$]. ORR was calculated as 70.7%, 21.1%, 12.2%, 6.2% and 2.3% in the 1st, 2nd, 3rd, 4th and 5th follow-up years, respectively. Positive correlation was found between ORR in 2nd, 3rd and 4th follow-up years and calculated absorbed doze > 150 Gy [$P = 0.005$, $P = 0.029$, $P = 0.005$, respectively], and tumor number in 2nd and 3rd follow-up years [$P = 0.035$, $P = 0.014$, respectively].

Conclusion: TARE in HCC is an effective treatment option, and tumor absorbed dose is the factor that most positively affects the outcomes. Sub-group analysis is essential in terms of dose-effect relationship regarding tumor number and size.

Keywords : TRANSARTERIAL RADIOEMBOLIZATION, YTTRIUM-90, HEPATOCELLULAR CARCINOMA

Oncologic interventional Radiology
SB-07

PERCUTANEOUS INTRALESIONAL BLEOMYCIN INJECTION FOR HEAD AND NECK REGION VASCULAR MALFORMATIONS: EVALUATION OF RESPONSE WITH MRI VOLUME MEASUREMENTS

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Introduction: Vascular malformations (VMs) are congenital lesions that can be debilitating and cause significant aesthetic and functional limitations. The chemotherapeutic agent bleomycin has been utilized as a sclerosant, directly injected percutaneously into the VM. This retrospective study aimed to assess the treatment response of head and neck region vascular malformations treated with intralesional bleomycin injection by measuring MRI volume changes in follow-up periods.

Materials-Methods: The patients diagnosed with head and neck region vascular malformation (HN-VM) and treated with intralesional bleomycin injection between 2017 and 2023 were retrospectively evaluated. Of these, the patients who were followed up with MRI at 1-year and 2-year periods were included in the study. The treatment response was evaluated by measuring MRI volumes of the lesions on fat-sat T2-weighted images at the end of 1-year and 2-year periods.

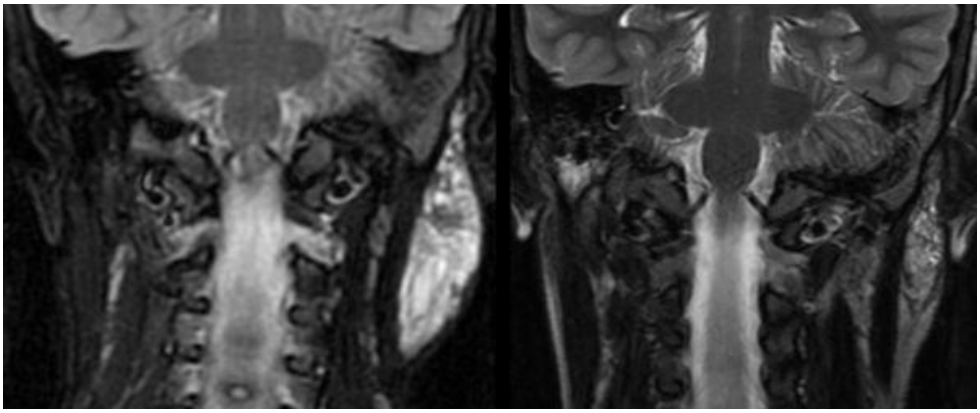
Results: The study included 20 patients (14 female and 6 male) with a total of 20 HN-VMs. The mean age of the patients was 15.67 (1,5 to 52 years)**.** The first follow-up MR was obtained at the end of the 1st year following the procedure and the 2nd follow-up MR was obtained at the end of the second year following the procedure. There were 14 patients in the first follow-up (1-year) group and 7 patients in the second follow-up (2-year) group. The pre-procedural HN-VM volumes in the first follow-up group (1-year) ranged between 0.2467 ml to 31.3266 (mean 7.9184 ml, median 3.698 ml). The post-procedural HN-VM volumes at the first MRI follow-up ranged between 0.0561 ml to 15.9926 ml (mean 3.715 ml, median 2.0672 ml). The pre-procedural HN-VM volumes in the second follow-up group (2-year) ranged between 0.4158 ml to 23.1034 ml (mean 7.387 ml, median 6.6897 ml). The post-procedural HN-VM volumes in the second MRI follow-up group ranged between 0 ml to 9.5255 ml (mean 2.406 ml, median 0.9 ml). The volume reduction in the first follow-up group (1 year) ranged between 2% to 93% (mean 53.2%, median 53% ml). The volume reduction in the second follow-up group (2 years) ranged between 39% to 100% (mean 70.57 %, median 73% ml). No complications except local and temporary complications such as hyperpigmentation, local pain, or itching at the site of injection occurred.

Conclusion: Percutaneous injection of bleomycin is a safe, effective, and inexpensive method for the treatment of head and neck region vascular malformations. This method has no serious complications and produces no skin scarring when appropriately used and may be used as the first choice of treatment for head and neck region malformations.

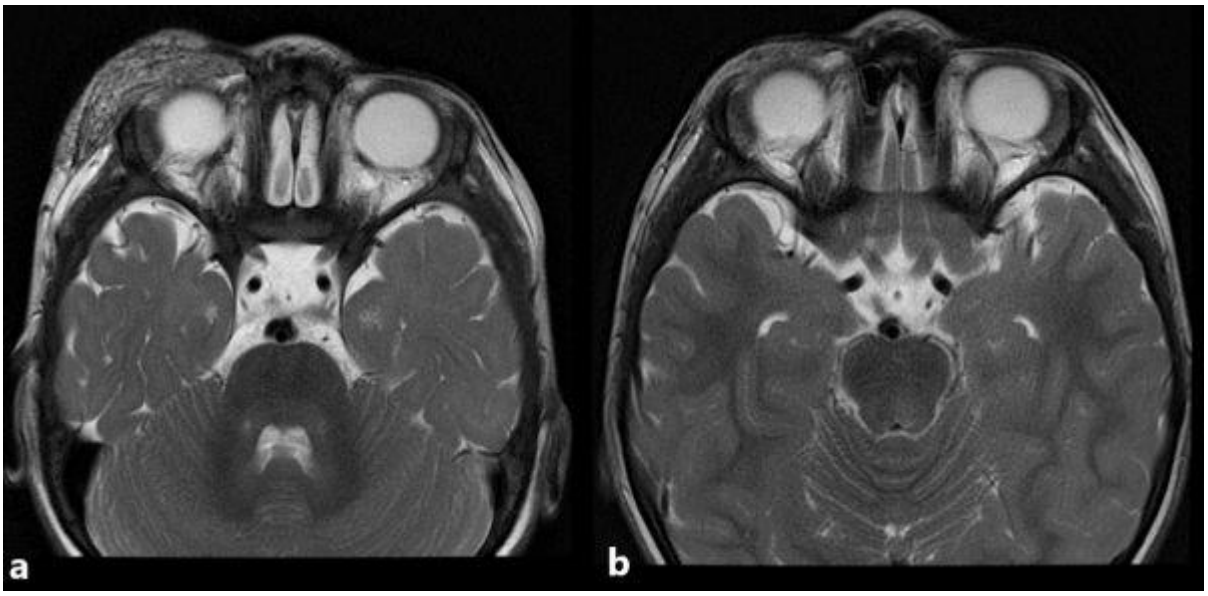
Keywords : Bleomycin, intralesional, magnetic resonance imaging, percutaneous, vascular malformation

Figure:

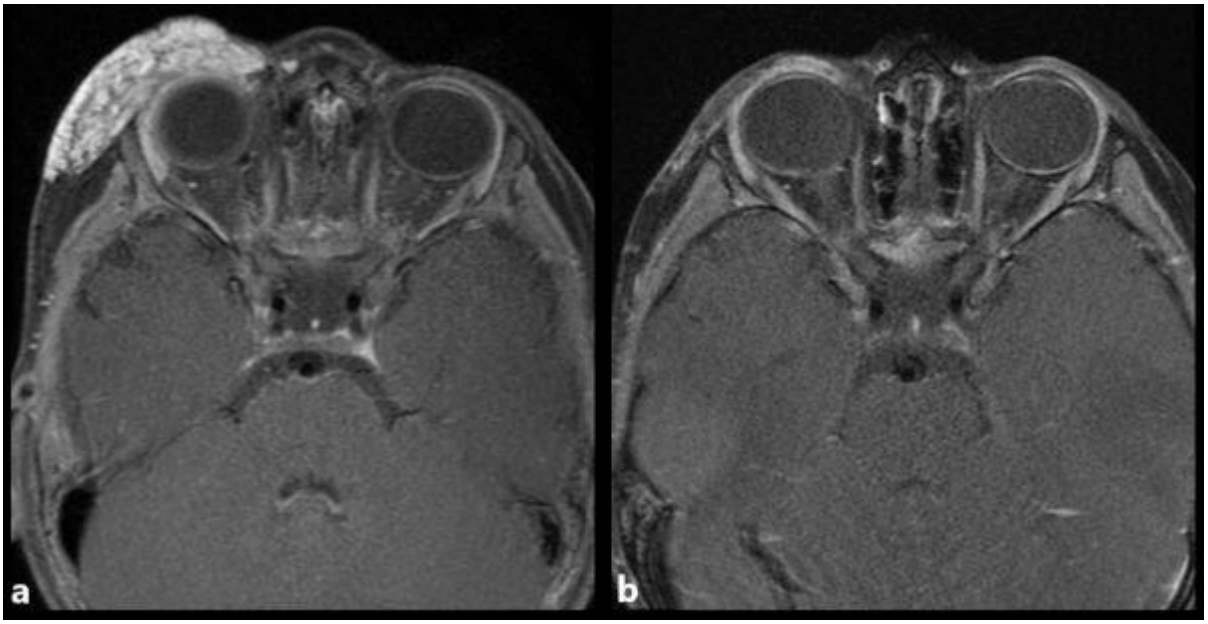
Description of the Figure: Figure 1. Pre-procedural (left) and post-procedural (right) coronal T2-weighted fat-suppressed images show significant volume reduction of the left parotid gland vascular malformation.



Description of the Figure: Figure 2a. Pre-procedural (a) and post-procedural (b) axial T2-weighted images show significant volume reduction of the right intrapalpebral vascular malformation.



Description of the Figure: Figure 2b. Pre-procedural (a) and post-procedural (b) contrast-enhanced axial T1-weighted images with fat suppression show significant volume reduction of the right intrapalpebral vascular malformation.



Oncologic interventional Radiology
SB-08

CAN DEEP LEARNING BASED SURVIVAL ANALYSIS WITH PERI-TUMORAL RADIOMICS PREDICT RECURRENCE AFTER TACE IN A GROUP OF HCC PATIENTS WITH ALL CONDITIONS MATCHED BY PROPENSITY SCORE MATCHING: A PILOT STUDY

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PURPOSE: Hepatocellular carcinoma (HCC) is the most common liver malignancy and the third leading cause of death among various cancers (1). Transarterial chemoembolisation (TACE) is widely used as a bridge to liver transplantation or as standard treatment for patients with intermediate HCC (2). However, response rates to TACE are heterogeneous and the appropriate selection of patients who will benefit particularly well from TACE in terms of overall survival is still debated.

Radiomics can obtain high-throughput quantitative data from multimodal imaging and potentially characterise tumour heterogeneity that can guide individual treatment(4)Numerous studies have shown that radiomics-based models can assist in clinical decision-making. (5).

HCC recurrenceis mainly intrahepatic suggests that peritumoural liver tissue may be a favourable background for spreading HCC cells (6). HCC patients with higher CD68+ cell density in peritumoural tissues had a significantly higher risk of recurrence or metastasis and cancer-related death. 7). Peritumoural tissues may have valuable information about HCC prognosis. It has been reported that CT- or MRI-based radiomics in peritumoural regions can effectively predict the prognosis of with HCC (8). In our study, we tried to find recurrence using deep learning-based survival analysis with peritumoral radiomics data. And we applied Propencity Score matching to make this evaluation relatively independent of the effects of disease stage and tumour biology.

METHODS: A total of 105 patients of HCC-TACE-Seg dataset were included in the study. Scikit.learn, Pycox, Deepsurv libraries from Phyton open source program were used Age, gender, viral etiology,cirrhosis,pathological grade, BCLC, TNM, Okuda, CLIP stage and many other variables were matched by Propensity Score Matching. 37 patients with progression after TACE and 37 patients without progression were included in the study. Peritumoral 1 cm of liver tissue was automatically segmented and radiomics features extracted.Machine learning phase was started, dimensionality reduction and hyperparameter optimisation were performed. Finally, the model success was evaluated with Concordance C index,

FINDINGS: After all necessary optimisations, the final model success was found to be Concordance C index 0.781 (S.E: 0.012) in DeepHit algorithm and Concordance C index 0.700 (S.E: 0.015) in Deepsurv algorithm. When Feature Importance analysis was applied to determine the importance of features in predicting survival outcomes, the most important features were found to be "GLSZM nonuniformity and GLCM JointEntropy" features.

CONCLUSION: Radiomics-based deep learning models are helpful in predicting recurrence after TACE in HCC treatment, even when all variables are equalised. Individualised decision models with clinical and radiological multidimensional data and individualised decision models with the inclusion of large series will be able to consolidate the success and use of TACE.

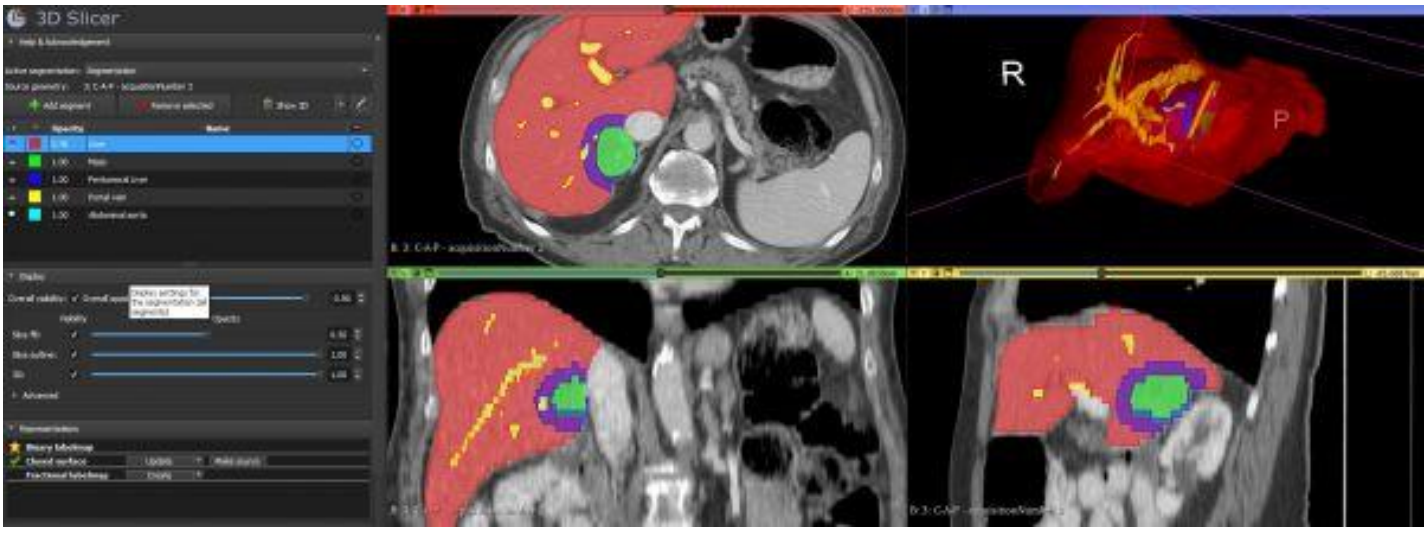
Keywords : HCC,TACE,PSM,DEEP SURVIVAL ANALYSIS

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Figure:

Description of the Figure: Segmentation Workflow



Oncologic interventional Radiology
SB-09

TRANSARTERIAL RADIOEMBOLIZATION PLUS SYSTEMIC TREATMENT WITH SORAFENIB VERSUS TRANSARTERIAL RADIOEMBOLIZATION ALONE IN HEPATOCELLULAR CARCINOMA WITH MACROVASCULAR INVASION

HUSEYIN TUGSAN BALLI[1], KAIRGELDY AIKIMBAEV[1], FERHAT CAN PISKIN[1], BEGUM GUZEL[1], BERKAY DIK[1], MERT GUL[1]
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PURPOSE: Macrovascular invasion (MVI) is a common complication in hepatocellular carcinoma (HCC) and is associated with worse prognosis. The purpose of this study was to compare outcomes in unresectable HCC patients with MVI treated by Yttrium-90 transarterial radioembolization [TARE] plus sorafenib or TARE alone.

MATERIAL AND METHODS: Sixty-nine consecutive HCC patients with MVI treated by TARE plus sorafenib (TARE plus sorafenib Group) or TARE alone (TARE alone Group) between October 2013 and February 2023 were included in the study. Overall survival (OS), overall time-to-progression (OTTP) and intrahepatic TTP (IHTTP) were compared between subgroups. Survival analysis was performed using the Kaplan-Meier method, and comparison of survival curves was performed using the log-rank test. *P* value <0.05 was considered for statistical significance.

RESULTS: In the entire patient population, mean age was 64.6 ± 8.2 years, sex distribution [males 90.9%], mean tumor size 9.2 ± 3.7 cm, mean number of tumors 3.4 ± 2.6, mean number of TARE per patient 1.36 ± 0.54, mean absorbed tumor dose 261.5 ± 138.1 [65 - 700] Gy, and mean follow-up duration was 23.4 ± 21.2 [min 6 - max 102] months. There was no difference between the subgroups in terms of age [64.4 ± 8.9 vs 64.7 ± 9.0 (years), *P*=0.539], sex [96.2% vs 80.9% males, *P*=0.999], number of tumors [3.5 ± 2.7 vs 3.3 ± 2.6, *P*=0.604], size of tumors [9.3 ± 4.4 vs 9.1 ± 3.2 (cm), *P*=0.846], and absorbed tumor dose [300.5 ± 128.8 vs 236.4 ± 139.5 (Gy), *P*=0.059]. The number of TARE procedures was greater in the TARE plus sorafenib Group [1.6 ± 0.5 vs 1.1 ± 0.4, *P* = 0.001] due to the more common bilobar distribution of the tumors [32.1% vs 18.3%, *P* = 0.029]. All patients developed a post-embolization syndrome that did not require prolonged hospitalization. Follow-up durations were significantly shorter in the TARE plus sorafenib Group [18.0 ± 12.5 months vs 27.3 ± 25.2 months, *P* = 0.034] due to higher death rates [100.0% vs 52.3%, *P* <0.000]. There was no difference in terms of median OS [95% CI 8.2 - 36.2 vs 11.0 - 55.9 (months), *P* = 0.080] or OTTP [5.4 ± 5.4 vs 4.2 ±4.1 (months), *P* = 0.742] [TARE plus sorafenib Group and TARE alone Group, respectively]. Although IHTTP was longer in TARE alone Group [6.1 ± 3.7 vs 16.7 ± 27.5 (months)], this difference was not statistically significant [*P* =0.059].

CONCLUSION: In the entire patient population, combination of TARE with sorafenib did not result in a significant improvement in OS, OTTP and IHTTP compared with TARE alone. Further studies with advanced analyzes are needed to determine the most appropriate patient subgroup for treatments consisting of the combination of TARE and sorafenib.

Keywords : TRANSARTERIAL RADIOEMBOLIZATION, YTTRIUM-90, SYSTEMIC TREATMENT, SORAFENIB, HEPATOCELLULAR CARCINOMA, MACROVASCULAR INVASION

Oncologic interventional Radiology
SB-10

DOSE-RESPONSE AND DOSE-SURVIVAL RELATIONS IN RADIOEMBOLIZATION TREATMENT OF ADVANCED STAGE COLORECTAL CARCINOMA LIVER METASTASES: A REAL-WORLD SINGLE-CENTRE STUDY

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Purpose: To compare the survival outcomes of the patients receiving estimated tumor absorbed dose (ETAD) <140 Gy versus ETAD ≥140 Gy in patients with advanced chemorefractory colorectal carcinoma liver metastases (CRCLM) treated with Yttrium-90 transarterial radioembolization (90Y TARE).

Materials and Methods: Between August 2016 and August 2023 adult patients with unresectable, chemorefractory CRCLM treated with 90Y TARE using glass particles, were retrospectively enrolled. The ETAD was calculated from the macro-aggregated albumin (MAA) scan using a multi compartment model with respect to the medical internal radiation dose (MIRD) approach, prior to each procedure. Overall survival (OS), hepatic progression free survival (hPFS) and objective response rate (ORR) were assessed. ORR was determined by using magnetic resonance imaging (MRI) or fluorodeoxy glucose positron emission tomography (FDG PET).

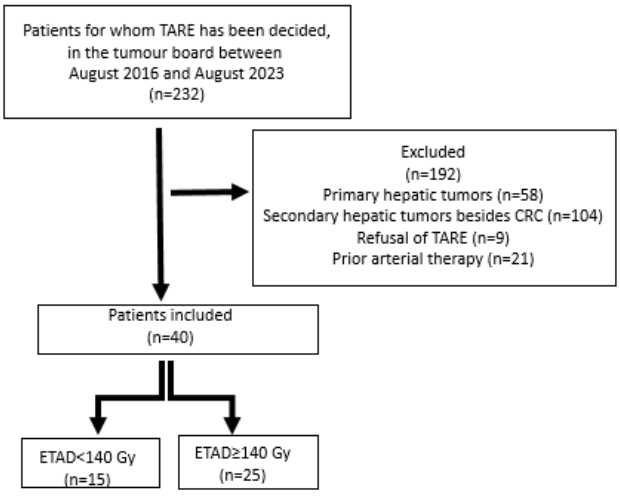
Results: A total of 40 patients with a mean age of 66.2±7.8 years met the inclusion criteria. Mean ETAD for the group 1 (ETAD <140 Gy) and group 2 (ETAD ≥140) were 131.2 ± 17.4 Gy versus 195 ± 45.6 Gy, respectively. The mean OS and hPFS for group 1 versus group 2 were 12±10.3 months and 8.1±9.3 months versus 9.3±3 months and 7.1±8.4 months, respectively and there were no significant differences (p=0.181 and p=0.366, respectively). ORR did not show significant difference between groups (p=0.432).

Conclusion: In real-world practice we found that there was no significant difference in OS, hPFS and ORR between patients who received ETAD <140 Gy versus ETAD ≥140 Gy in patients with CRCLM, in this series.

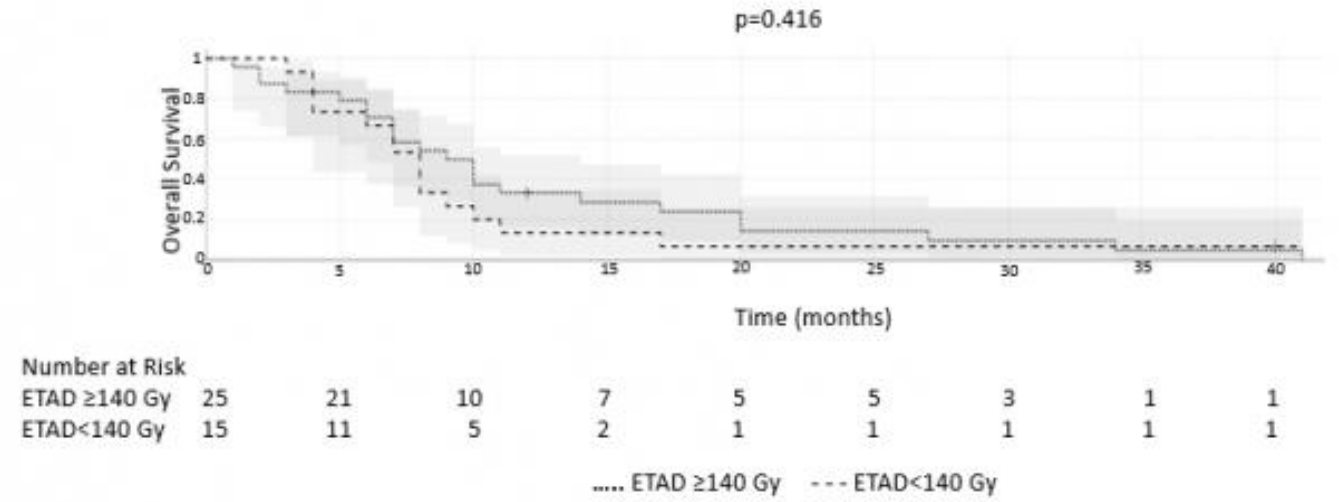
Keywords : Colorectal liver metastases, radioembolization, TARE, 90Y

Figure:

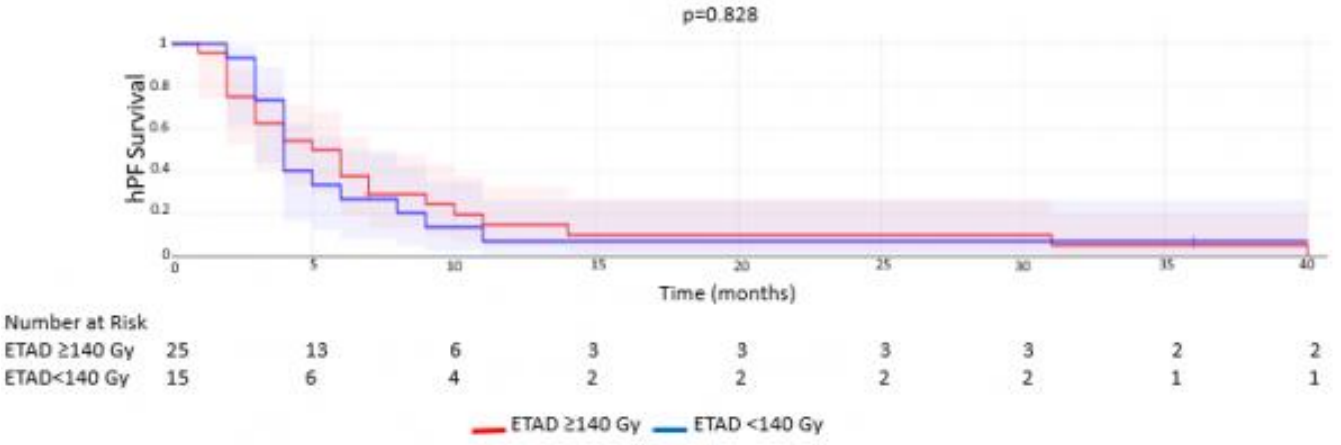
Description of the Figure: Figure 1. Study flowchart. TARE; transarterial radioembolization, ETAD; estimated tumor absorbed dose.



Description of the Figure: Figure 2. Kaplan-Meier analysis of overall survival for patients receiving ETAD ≥140 Gy versus ETAD <140 Gy. ETAD; estimated tumor absorbed dose.



Description of the Figure: Figure 3. Kaplan-Meier analysis of hepatic progression free survival for patients receiving ETAD ≥140 Gy versus ETAD <140 Gy. ETAD; estimated tumor absorbed dose, hPF; hepatic progression free.



Tables:

Table1. Association between estimated tumor absorbed doses and study parameters (ETAD; estimated tumor absorbed dose, ECOG; eastern cooperative oncology group, hPFS; hepatic progression free survival)

Parameter	ETAD < 140 Gy (n=15)	ETAD ≥140 Gy (n=25)	P value
Mean ETAD	132.2 ± 16.9 Gy	196.9 ± 45.5 Gy	0.500
Extrahepatic disease	8 (53.3%)	17 (68%)	0.502
Overall survival	9.3 ± 3 months	12 ± 10.3 months	0.181
hPFS	7.1 ± 8.4 months	8.1 ± 9.3 months	0.366
ECOG status			0.168
0	10 (66.6%)	18 (72%)	
1	4 (26.6 %)	6 (24%)	
≥2	1 (6.6%)	1 (4%)	

Table 2. Objective response rates with respect to the estimated tumor absorbed doses (CR; complete response, PR; partial response, SD; stable disease, PD; progressive disease, NA; non-applicable)

Outcome	ETAD < 140 Gy (n=15)	ETAD ≥140 Gy (n=25)	P value
Overall response, No. (%)			
CR	2 (13.3%)	6 (24%)	0.414
PR	7 (46.6%)	12 (48%)	0.934
SD	1 (6.6%)	-	-
PD	5 (33.3%)	6 (24%)	0.522
NA	-	1 (4%)	-
Objective response rate	9 (60 %)	18 (72%)	0.432

Vascular interventional Radiology
SB-11

PRELIMINARY RESULTS OF NOVEL SOLARIS SELF-EXPANDABLE COVERED STENTS IN PERIPHERAL ARTERIAL DISEASE

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Purpose: To present the preliminary results of using newly introduced Solaris self-expandable covered stents (Scitech Medical, Goias, Brazil) for peripheral arterial disease.

Materials and Methods: A retrospective review was conducted on all consecutive patients treated with Solaris self-expandable covered stents between September 2023 and November 2023. Recorded data included demographic characteristics, comorbidities, lesion locations, lesion characteristics, pre-procedural symptoms, follow-up examinations, adverse events, and mortality status. Technical success was defined as <30% residual stenosis on post-procedural angiography, and clinical success criteria included at least a 1-point improvement in the Rutherford category. Follow-up imaging with computed tomography angiography or Doppler ultrasound was planned.

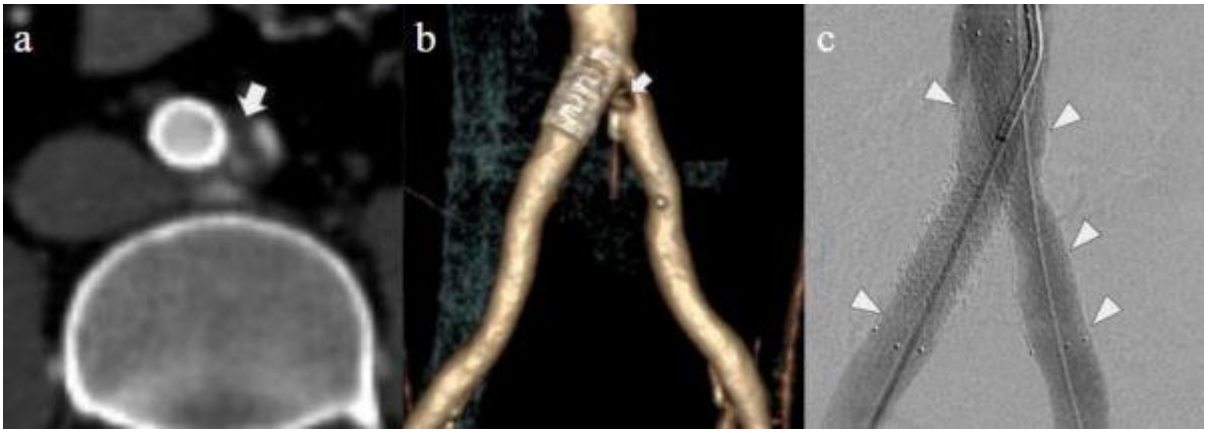
Results: In the study population of 15 adult patients (80.0% male, mean age 61.5±6.3 years), the mean follow-up period was 48.7±17.6 days (Table 1). A total of 26 stents of different sizes were deployed (Table 2). Stents were implanted in the stenosis area in 5 patients and in the occlusion area in 10 patients (Figure 1). The covered endovascular reconstruction of aortic bifurcation technique was used in patients with extensive aortoiliac disease (n=3). The technical success rate was 100%, and the clinical success rate was 92.9%. Two patients with plaque/thrombus migration during the procedure underwent stenting, while in one case due to the presence of widespread thrombus, surgical endarterectomy was performed. Throughout the follow-up, there were no major adverse events, stent restenosis, target lesion revascularization, bypass surgery, or major limb amputation. In-hospital mortality, resulting from cardiac arrest unrelated to the procedure, was observed in one patient. The overall mortality rate was 7.1% (n=1).

Conclusion: The initial outcomes of Solaris self-expandable stents have demonstrated high technical success, satisfactory clinical improvement, the absence of the need for early reintervention, and no structural concerns. Being the first study on these novel stents, it may contribute to clinical practice.

Keywords : Peripheral arterial disease, stent, self-expandable covered stent

Figure:

Description of the Figure: Figure 1 In the pre-procedural CT angiography, axial images (a) and 3D reconstruction images (b) revealed a significant stenosis (arrow) at the origin of the left common iliac artery in a patient. Following treatment with a Solaris covered stent with kissing stent technique, post-procedural digital subtraction angiography (c) showed patent stents (arrowheads)



Tables:

Table 1. Baseline patient characteristics

	Total (n=15)
Hypertension	10 (66.7)
Diabetes mellitus	6 (40)
Coronary artery disease	9 (60)
Smoking (pack-years)	39.7±26.3
Peripheral arterial bypass graft history	2 (13.3)
Previous endovascular treatment in the target lesion area	2 (13.3)
Limb amputation history	0 (0)
Data are presented as number (percentage) and mean±standard deviation.	

Table 2. The locations and features of the implanted stents

Diameter (mm)-Length (mm)	Iliac artery (n=22)	Femoral artery (n=3)	Popliteal artery (n=1)
6-80			1
7-60		1	
7-80		2	
8-60	2		
8-80	4		
9-40	4		
9-60	5		
9-80	7		

Vascular interventional Radiology
SB-12

ENDOVASCULAR TREATMENT OF ISOLATED ILIAC ARTERY ANEURYSMS

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Purpose: Isolated iliac artery aneurysms, while rare, pose life-threatening risks, with a prevalence of 0.03% in total population. These aneurysms exhibit accelerated expansion rates beyond 3 cm. Those larger than 3.5 cm in diameter significantly predisposed to rupture, thus should be treated. Endovascular treatment (EVT) is an effective alternative to open surgery. This study aims to share our single-center experience in treating iliac artery aneurysms via endovascular means.

Method: A total of 26 patients with 27 isolated iliac artery aneurysms, treated using endovascular techniques (EVT), were included in this study (mean age: 70 years, range: 52-92 years, 24 male, 2 female). All patients underwent pre-treatment evaluation via CT angiography. If there is no contraindication CT scans were planned on all patients at 12 months after the procedure. In case of renal impairment color duplex ultrasound was the modality of choice for follow-up.

Results: Our cohort of 27 treatments and their classification according to CIRSE classification system (Uberoi et al.) are as follows;

Type A; CIAA with insufficient proximal landing zone,

Type B; CIAA with insufficient distal landing zone,

Type C; CIAA with both adequate landing zones,

Type D; isolated IIAA

Type E; aneurysms extending from the CIA to IIA

Other; isolated EIAA

Fig.1

Table 1

Technical success rate was 100% and complete aneurysm exclusion rate was 89% (24/ 27). In the follow-up period up to 3 years (mean 14 months), additional coil embolisation of the aneurysm sac was performed in 3 cases. One patient died in the first week of follow up.

Conclusion:

EVT with aforementioned various devices is an effective and safe treatment option for iliac artery aneurysms, demonstrating favorable clinical outcomes.

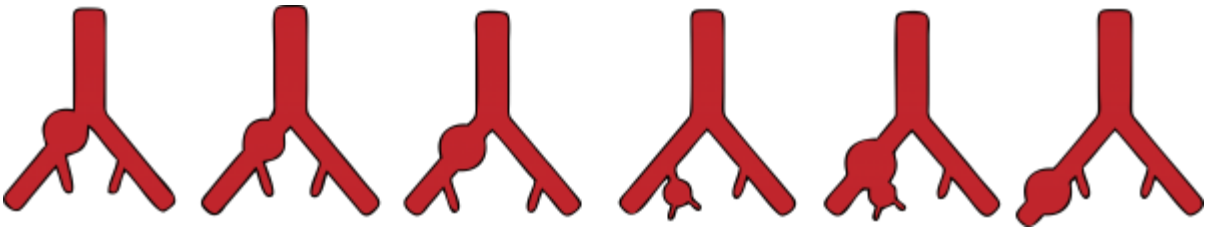
Keywords : iliac artery, aneurysm, stent, interventional radiology, angiography

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Figure:

Description of the Figure: CIRSE classification system (Uberoi et al.)



Tables:

EVT (n=27)

-	A	B	C	D	E	Other
Aortobiiliac SG	5	-	-	-	-	-
IIA embolization* + CIA to EIA SG	-	5	-	-	-	-
CIA SG	-	-	4	-	-	-
IIA SG**	-	-	-	2	-	-
CIA to EIA SG + CIA to IIA SG	-	-	-	-	3	-
IBD SG	-	5	-	-	1	-
Flow diverter	-	1	-	-	-	-
EIA SG	-	-	-	-	-	1

Vascular interventional Radiology
SB-13

PERCUTANEOUS TREATMENT OF IATROGENIC FEMORAL ARTERY PSEUDOANEURYSMS WITH VASCULAR CLOSURE DEVICES: SINGLE CENTER EXPERIENCE

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[1]Gazi University, Faculty Of Medicine, Department Of Radiology

Purpose: Iatrogenic pseudoaneurysms (PAs) arise from the disruption of the arterial wall, resulting in extravasation of blood into the surrounding tissue.Iatrogenic sources are leading cause of PA formation. There is an upward trend in the incidence due to the growing number of endovascular procedures. Iatrogenic femoral PAs are documented in up to 6% of patients following diagnostic or therapeutic interventions.Anticoagulant and antiplatelet medications further increases the risk of PA development.

A novel endovascular method with vascular closure devices has been used recently for the percutaneous treatment of PAs. We report our single-center experience with the percutaneous treatment of femoral PAs using vascular closure devices.

Methods: 14 patients with iatrogenic femoral artery pseudoaneurysms, treated with percutaneous method using vascular closure devices (AngioSeal-Terumo®, ExoSeal-Cordis®), were included in this study (mean age: 62 years, range: 51-83 years, 7 male, 7 female). Prior to the treatment, all patients underwent assessment using color Doppler ultrasonography. Appropriate closure device (5F - 9F) was selected according to the PA location, sac and neck sizes. The PA is directly punctured in proximity to the aneurysmal neck utilizing a 21G micropuncture needle. Subsequently, a microwire (0.014–0.018") is introduced into the parent artery through the neck of PA. Upon conversion to a 0.035" access system, a proper size sheath is inserted into the parent artery. Finally, an adequate size vascular closure device is deployed to obliterate the neck and induce trombosis.

Results: Technical success rate was %100. All patients had been followed up with color Doppler US after treatment. In all patients, ultrasound revealed complete hemostasis and the collagen plug at the arterial wall. No complications occured after treatment. Follow-up revealed no evidence of recurrence.

Conclusion: Percutaneous treatment of pseudoaneurysms with vascular closure devices is a convenient and straightforward procedure, causing minimal discomfort to the patient. This method can be succesfully used for iatrogenic femoral PAs with a neck <5 mm and in other arterial locations.

Keywords : pseudoaneurysm, endovascular treatment, femoral artery, vascular closure devices

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Vascular interventional Radiology
SB-14

HEMOPTYSIS IN PATIENTS WITH PULMONARY ARTERY PSEUDOANEURYSMS: ANALYSIS OF THE THERAPEUTIC APPROACH AND ITS OUTCOME

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Purpose: To evaluate the therapeutic approach and its outcome of pulmonary artery pseudoaneurysm (PAP) with various etiologies and types.

Materials and Methods: We retrospective analyzed 26 patients with PAP among 5457 consecutive patients who performed computed tomography (CT) scan for hemoptysis from March 2010 to January 2023. The electronic medical records and CT findings were analyzed to evaluate the patient characteristics, underlying lung parenchymal abnormalities, the etiologies of PAP, and the characteristics of PAPs. The therapeutic approach for PAPs and the its outcome were evaluated.

Results: A total of 27 PAPs were treated in 26 patients (M:F=25:1, age range: 42~77yrs). The etiologies of 27 PAPs were pulmonary tuberculosis (n = 23), necrotizing pneumonia (n = 3), and iatrogenic (n = 1). The amount of hemoptysis on arrival was variable from 0 to 1000cc. The patients with PAPs followed by necrotic pneumonia or iatrogenic lung injury showed no hemoptysis or blood tinged sputum (BTS). Interventional and medical treatment were performed in 24 and 3 patients, respectively. In the interventional treatment group, bronchial or systemic artery embolization (BAE), pulmonary artery embolization (PAE), combination of these were performed in 12, 4, 8, respectively. In 6 patients who was performed BAE, PAP was directly embolized through systemic to pulmonary shunt. Regression of PAPs or cessation of the hemoptysis were observed in 23 PAPs. Two patients underwent BAE received surgical removal for corresponding lobe in follow up period. Two patients one in PAE group and one in BAE with PAE group were expired due to sepsis and massive blood loss, respectively.

Conclusion: Interventional approach is effective for treating PAP. However, PAPs not always present with massive hemoptysis and medical approach can be considered in case of isolated PAP.

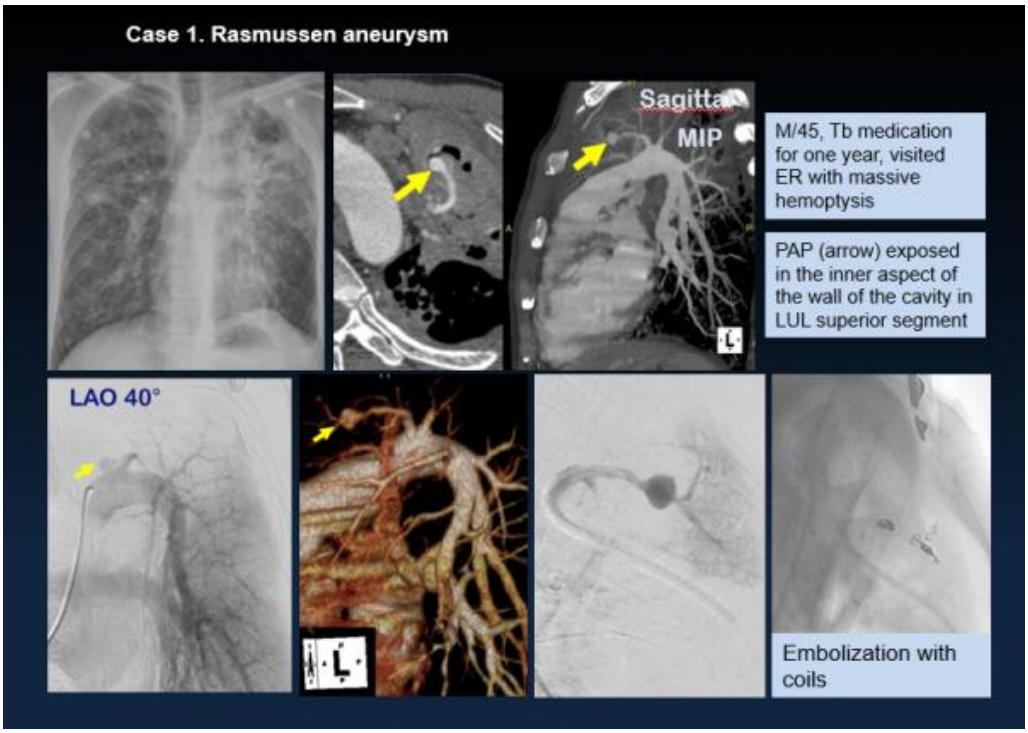
Keywords : Hemoptysis Embolization, Therapeutic Artery, Pulmonary Pseudoaneurysm Tuberculosis

References:

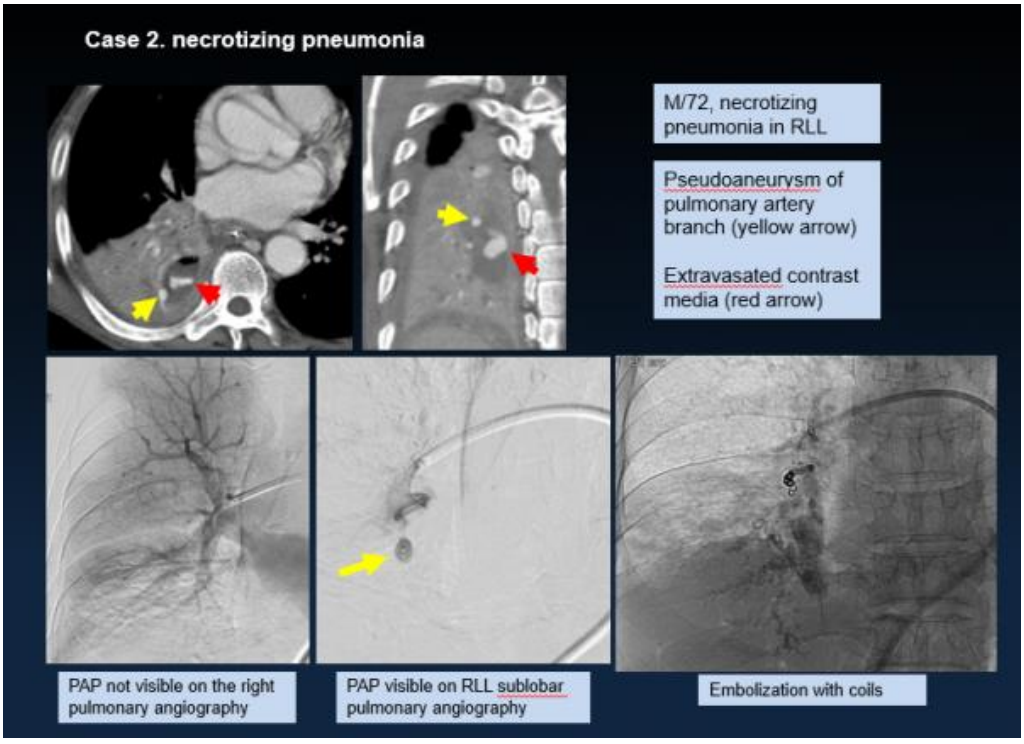
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Figure :

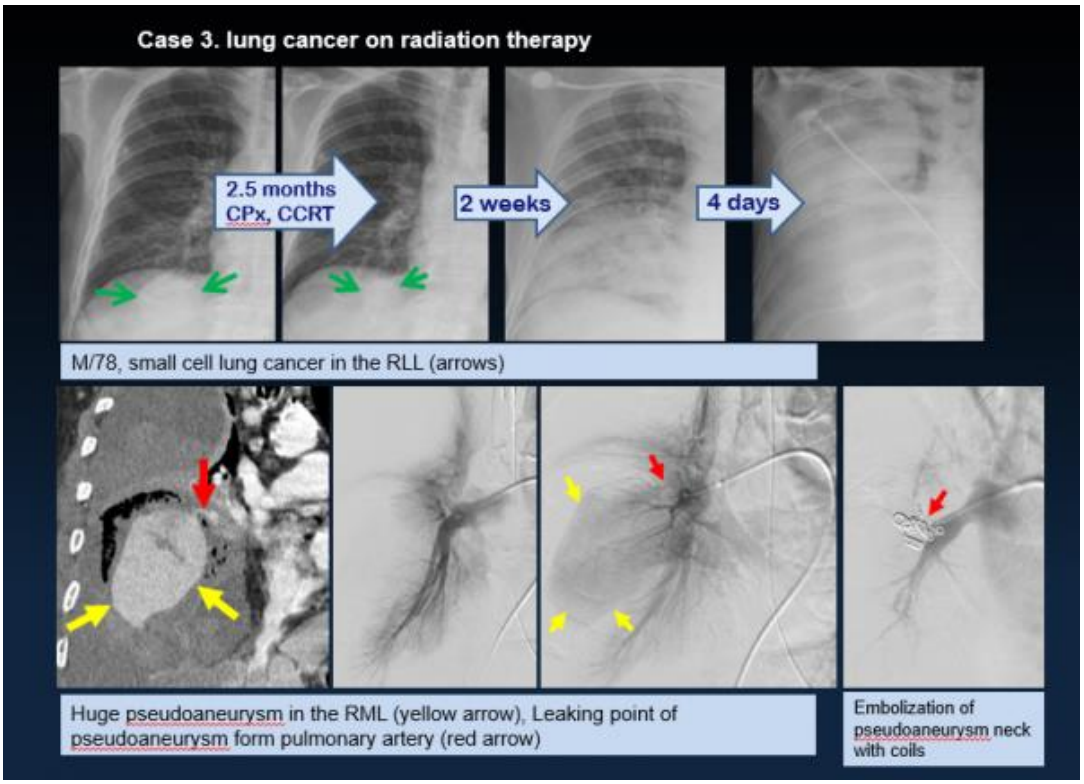
Description of the Figure: Rasmussen aneursym



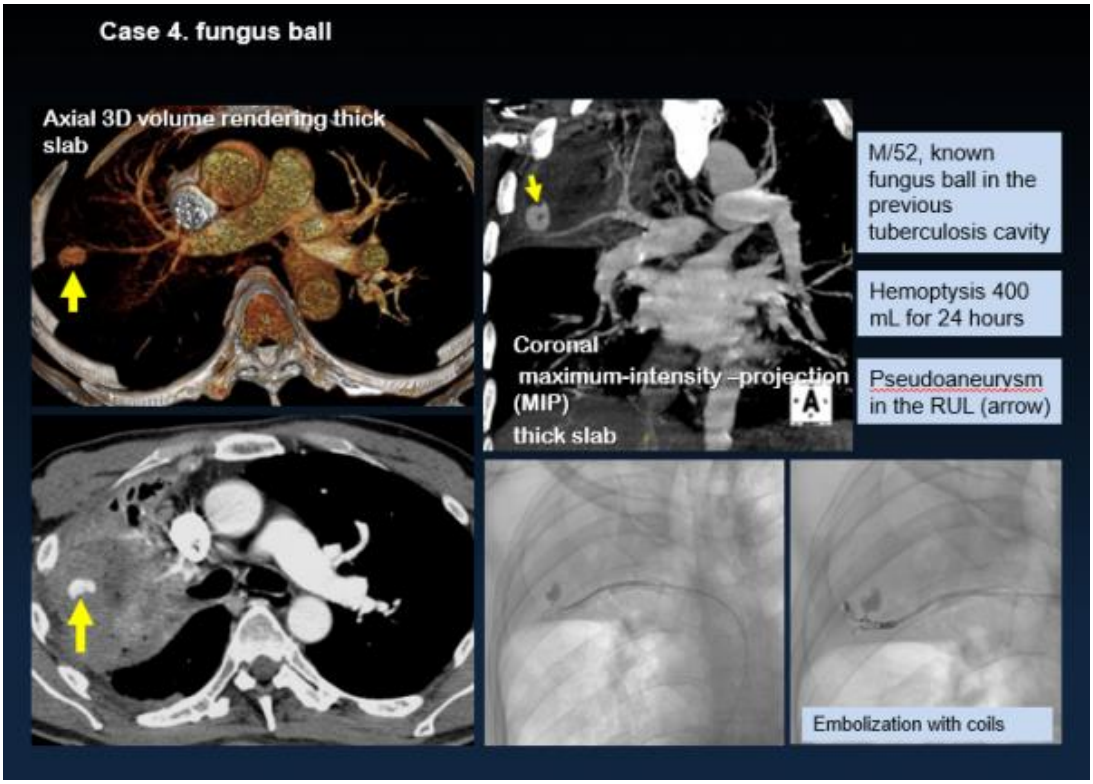
Description of the Figure: Necrotizing pneumonia



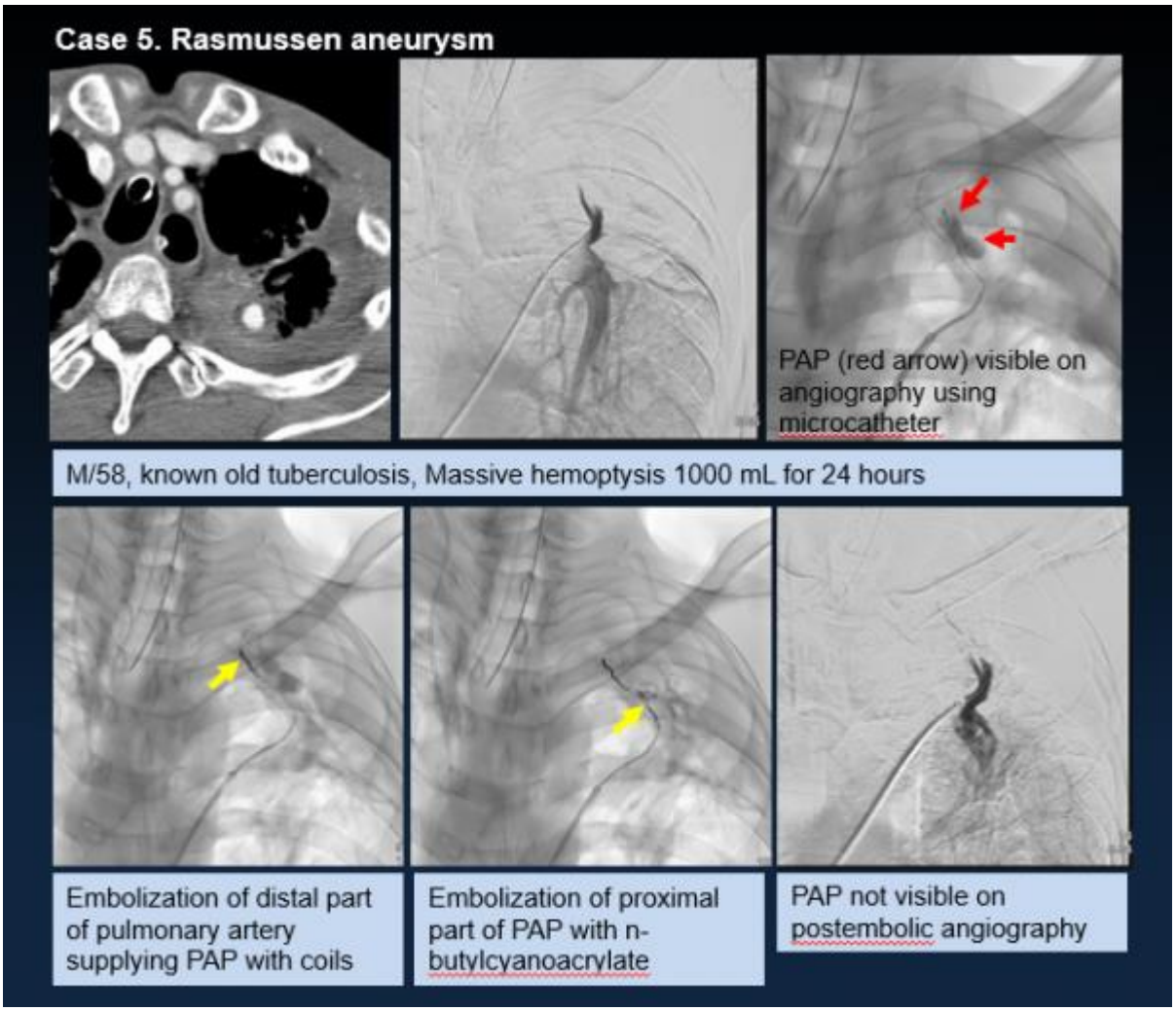
Description of the Figure: Lung cancer on radiation therapy



Description of the Figure: Fungus ball



Description of the Figure: Rasmussen aneursym



Vascular interventional Radiology
SB-15

ASSOCIATION OF RADIOCEPHALIC ARTERIOVENOUS ANATOMICAL MARKERS WITH POST-ANGIOPLASTY BLOOD FLOW VOLUME

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Purpose: Doppler ultrasound (DUS) blood volume flow (VF) calculation is the most reliable method for demonstrating the success of endovascular treatment of dysfunctional radiocephalic arteriovenous fistula (AVF). Due to the difficulty of this method for the interventionalist, VF-correlated markers are required during the procedure.The purpose of this study was to investigate the relationship between intraprocedural anatomical markers (AMs) and changes in blood volume flow (VF) induced by percutaneous transluminal angioplasty (PTA).

Methods: The study included 56 dysfunctional radiocephalic AVF patients who underwent PTA between September 2020 and 2022. All patients' VF was measured by DUS before and one hour after PTA. AMs were determined from 10 images, 5 before and 5 after balloon angioplasty.

Results: Post-PTA VF was 637 ± 277 mL/min, compared to baseline 151 ± 107. Before and after balloon angioplasty, VD (vein diameter), AD (artery diameter), MLD (stenosis minimum luminal diameter), SP (stenosis percentage), and VF values were statistically significant (p = 0.001). Spearman correlation analysis showed a positive strong linear relationship between VF and MLD (r_s: 0.850, p <0.001), and a negative strong linear relationship between VF and SP (r_s: 0.815). ROC analysis showed that the sensitivity and specificity for VF≥400 ml/min at cut-offs of SP <50% and MLD > 2.5 mm were 81%, 82% and 81%, 90%, respectively.

Conclusion: Among the AMs readily available during PTA, first MLD and then SP provided satisfactory results in predicting VF.

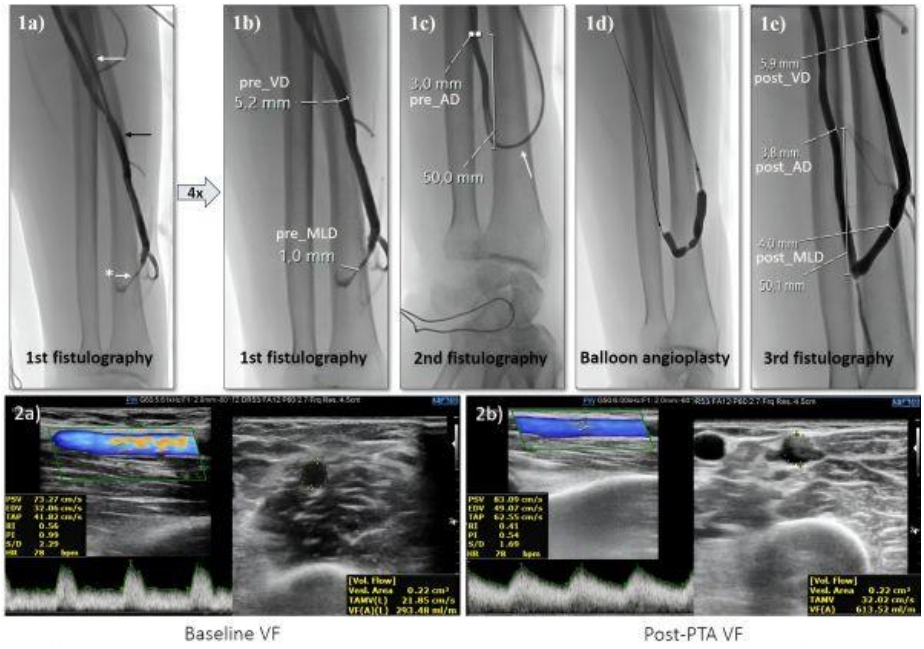
Keywords : arteriovenous fistula, doppler ultrasound, anatomical markers, blood volume flow, angioplasty, haemodialysis

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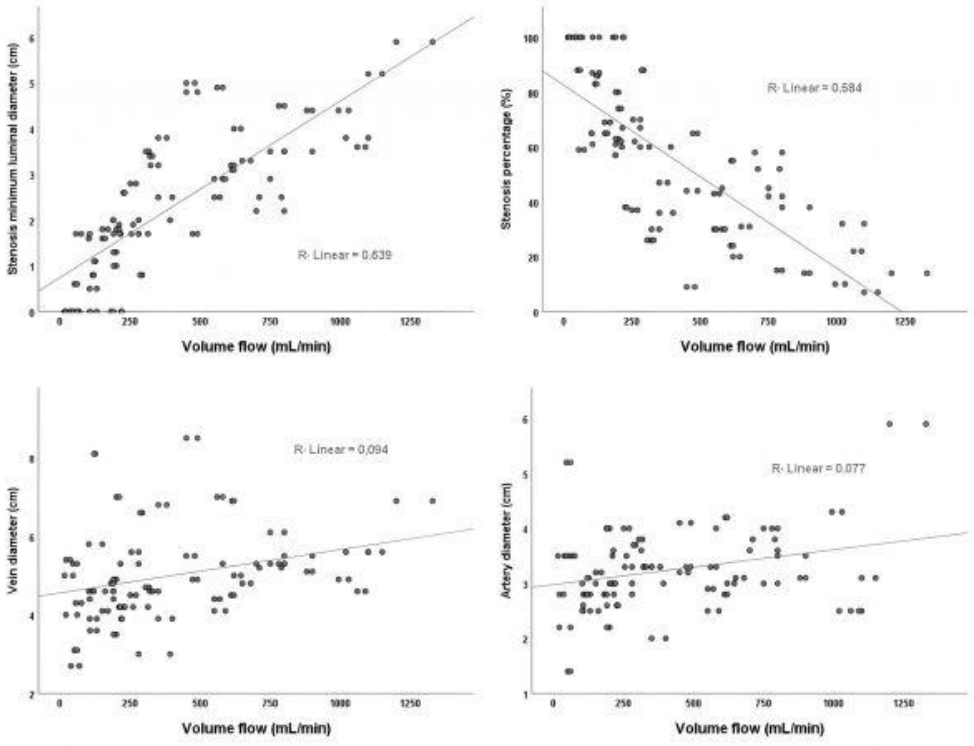
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Figure :

Description of the Figure: Figure 1. 68-year-old female patient with a left native radiocephalic AVF. PTA procedure and VF measurements are shown.



Description of the Figure: Scatter plots showing the correlation between VF and MLD, SP, VD, and AD, respectively, are presented.



Tables:

Table 1. Patient demographics and pre-procedural US grayscale findings

	n = 56
Male/Female	44 (79%)/12 (21%)
Age	64±9
Radiocephalic AVF side (left)	50 (89%)
Pre-procedural US	
Lesion length (mm)	34±4
Cephalic vein thrombosis	12 (21%)
Cephalic vein stenosis	38 (68%)
AV anastomotic stenosis	6 (11%)

Table 2. Comparison of AMs and VF before and after balloon angioplasty

Anatomical markers				p value
pre_VD (mm)	post_VD (mm)	4.7 ± 1.3	5.1 (4.6-5.7)	<0.001
pre_AD (mm)	post_AD (mm)	3.1 ± 0.8	3.4 ± 0.8	<0.001
pre_MLD (mm)	post_MLD (mm)	1.6 (0-1.8)	3.6 ± 0.8	<0.001
pre_VD/AD	post_VD/AD	1.6 ± 0.5	1.6 ± 0.4	0.259
pre_SP (%)	post_SP (%)	76 ± 19	32 ± 13	<0.001
Volume flow (mL/min)				
baseline VF	post-PTA VF	151 ± 107	637 ± 277	<0.001

Table 3. Correlation analysis results of AMs and VFs

	VF (mL/min)	
Anatomical markers	**rs**	p value
MLD	0.850**	<0.001
VD	0.384**	<0.001
AD	0.231*	0.014
VD/AD	0.62	0.519
SP	-0.815**	<0.001

Table 4. According to the ROC analysis, the diagnostic success of the optimal cut-off values determined in SP, MLD, and SP+MLD for VF ≥ 400 mL/min

VF ≥ 400 mL/min	Cut-off	Sensitivity	Specificity	PPV	NPV	AUC	95% CI
SP (%)	<30	94%	47%	65%	84%	0.782	0.68-0.88
SP (%)	<50	81%	82%	87%	74%	0.901	0.85-0.96
MLD (mm)	>2.5	81%	90%	93%	76%	0.922	0.87-0.97
MLD + SP	>2.5 + <50	81%	84%	89%	75%	0.815	0.73-0.90

Vascular interventional Radiology
SB-16

PULMONARY ARTERIOVENOUS MALFORMATIONS : HOW TO EMBOLIZE ?

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Purpose: Pulmonary arteriovenous malformations (PAVMs) are pathologic direct communications between pulmonary artery and vein that results in right-to-left shunt. They can be associated with significant morbidity and mortality, such as brain abscesses, cerebral stroke, and pulmonary hemorrhage. The majority of cases are associated with HHT (Hereditary Hemorrhagic Telengiectasia). PAVMs can be divided into simple and complex types according to number of feeding pulmonary arteries. When treatment is indicated, the first choice is endovascular embolization with different embolic agents.

Methods: All procedures were performed interventional radiologists with transfemoral venous approach and using appropriate catheters. Technical success is defined as complete occlusion of the nidus and feeding artery with no evidence of residual blood flow through the PAVM. In all patients coils were used. In one patient vascular plug was used additionally.

Results or Findings: There were 17 patients included in the study. Female-to-male ratio was 16 : 1 and they were aged between 27 and 70 years. Two patients had a confirmed diagnosis of HHT. A total of 41 PAVMs were observed. In five patient lesions were multiple. 20 PAVMs were at superior lobes of the lungs. 4 PAVMs had complex angioarchitecture while the rest was simple. One patient required a second step procedure. Almost all of PAVMs were embolised using coils. In one patient plug was used additionally. The immediate success rate of the transcatheter PAVM embolisation reached 100% in this study. There were no major complications related to procedures.

Conclusion: Endovascular embolization is a safe and effective first-choice treatment for PAVMs. The choice of embolic agent depends on vascular anatomy, vessel size and operator's preference. Currently coils or vascular plugs are available. Some coils carry microfibres which activate platelets to generate an occluding platelet plug, while vascular plugs provide direct obstruction to vascular flow. Liquid embolics can be used after a coil/plug deployment to achieve complete embolization.

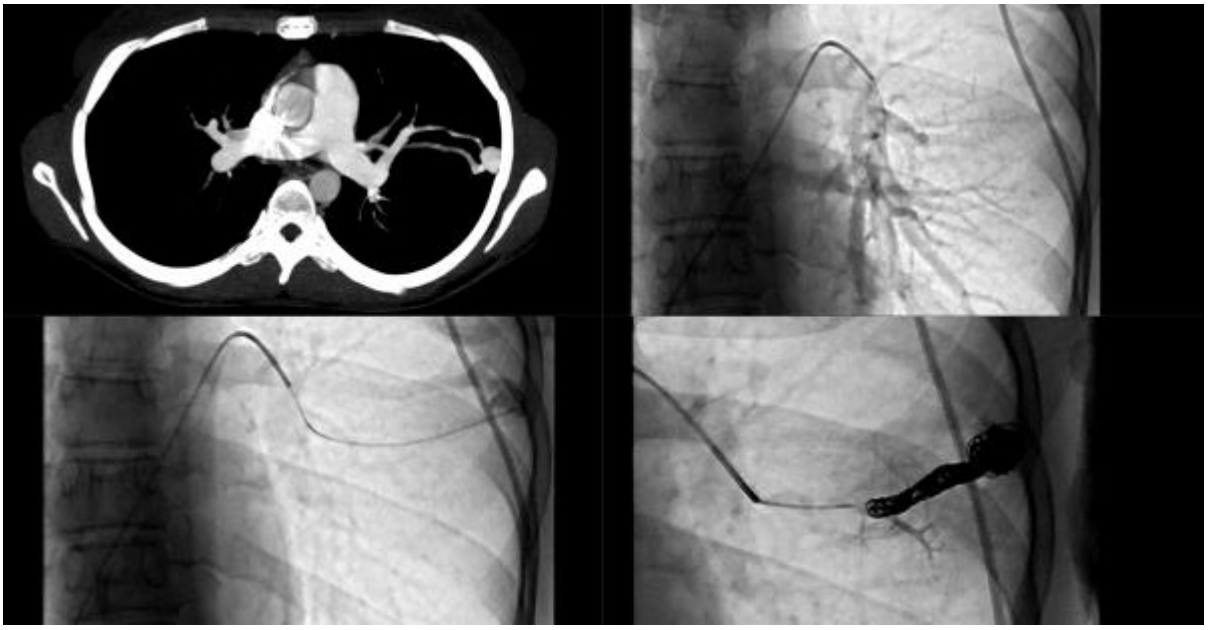
Keywords : Hemoptysis , Therapeutic Embolization , Arteriovenous Malformations , Pulmonary Artery

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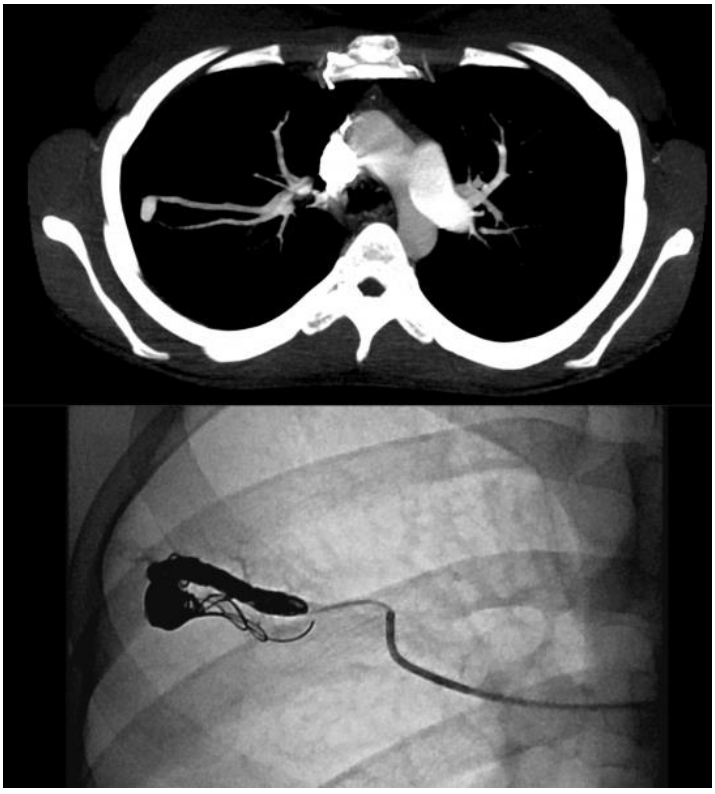
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Figure:

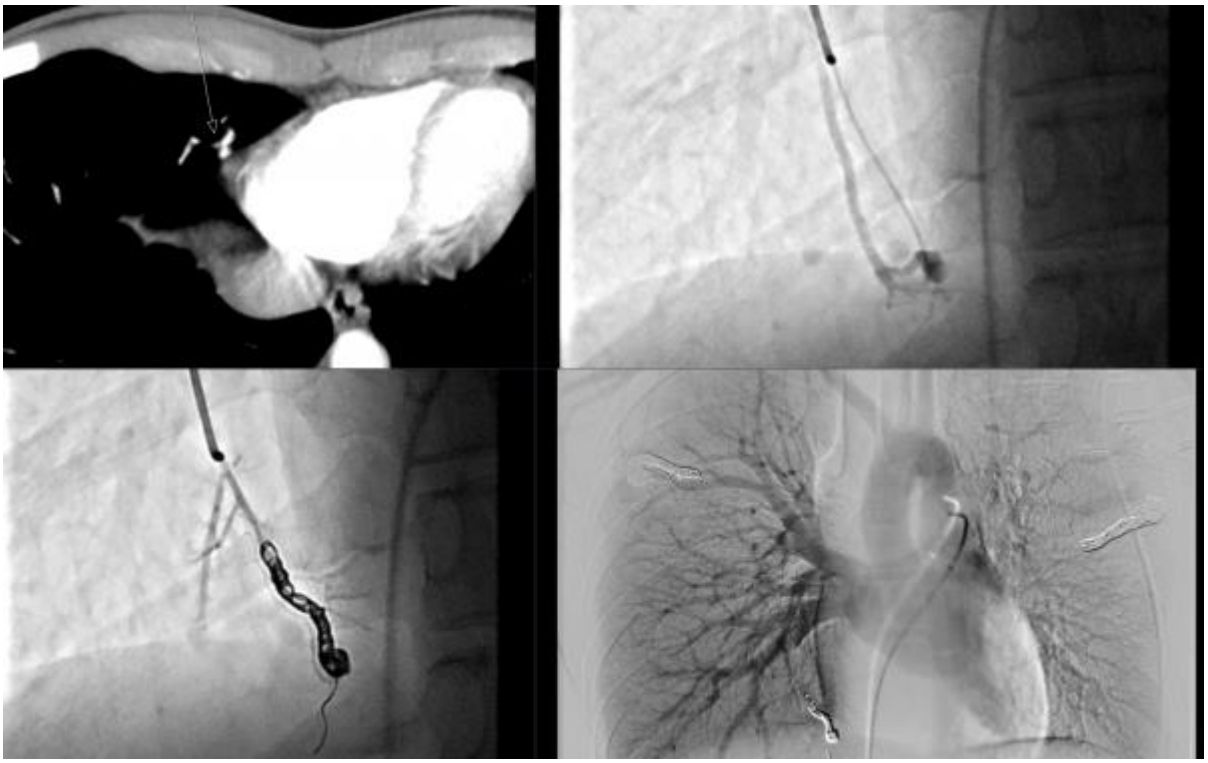
Description of the Figure: Patient number 1: 27-year-old female. HHT is diagnosed. PAVM in left superior lobe anterior segment. Embolized with coils.



Description of the Figure: Patient number 1: 27-year-old female. HHT is diagnosed. PAVM in right superior lobe anterior segment. Embolized with coils.



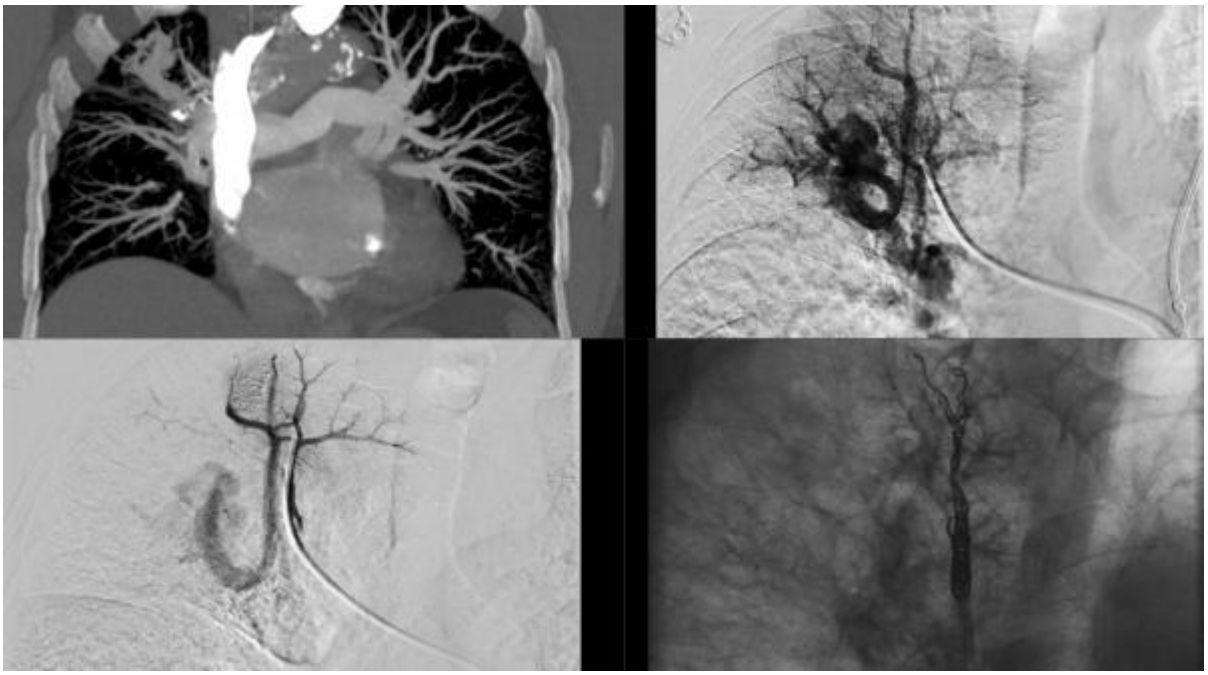
Description of the Figure: Patient number 1: 27-year-old female. HHT is diagnosed. PAVM in right inferior lobe medialbasal segment. Embolized with coils. In the last image (right inferior) we see total results. 3 PAVMs were embolized with coils succesfully.



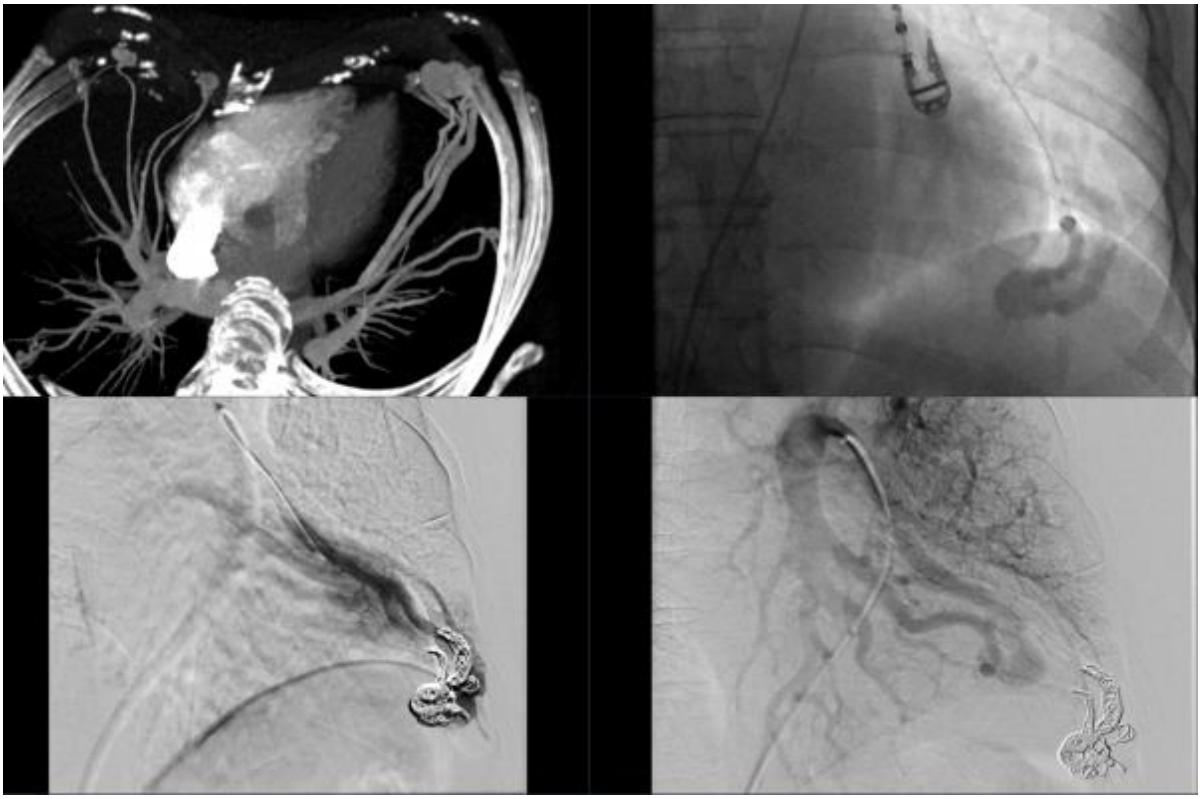
Description of the Figure: Patient number 1: 27-year-old female. HHT is diagnosed. After succesfully embolization of three PAVMs, this patient had another PAVM at different site which was also embolized with coils.



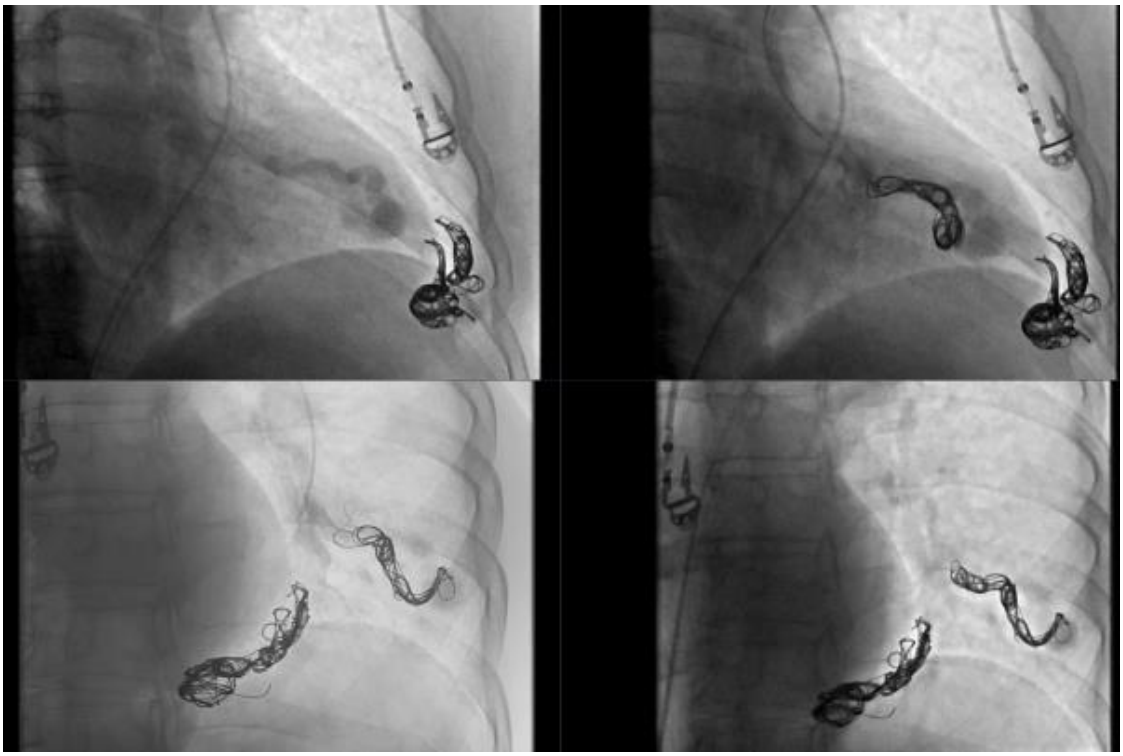
Description of the Figure: Patient number 2: 64-year-old female. HHT is not diagnosed. PAVM in right superior lobe anterior segment. Embolized with coils.



Description of the Figure: Patient number 3: 58-year-old female. HHT is diagnosed. Multipl PAVMs in both lungs. Two biggest PAVMs were embolized to relieve the symptoms.



Description of the Figure: Patient number 3: 58-year-old female. HHT is diagnosed. Multipl PAVMs in both lungs. Two biggest PAVMs were embolized to relieve the symptoms.



Description of the Figure: Patient number 4: 74-year-old male. The only male patient in this paper. HHT is not diagnosed. PAVM in right inferior lobe posterobasal segment. Embolized with coils.



Vascular interventional Radiology
SB-17

PERCUTANEUS TREATMENT OF ENDOLEAK AFTER EVAR AND TEVAR

Seymur Samadli[1], Erhan Turgut Ilgıt[1], Mehmet Koray Akkan[1], Fatih Öncü[1], Baran Önal[1], Sertaç Bekir Cömert[1], Tunjay Mammadov[1], Burak Mert Akhan[1], Nemat İbrahimkhanli[1]
[1]Gazi University

Introduction and Purpose: Endovascular aneurysm repair abdominal or thoracic (EVAR) has emerged as the preferred therapeutic option for managing abdominal aortic aneurysms. Among the potential complications that may arise following this procedure, the endoleak, is characterized by ongoing perfusion of the aneurysm sac. The approach to managing endoleak detected during follow-up imaging subsequent to EVAR/TEVAR varies, with options ranging from close monitoring at shorter intervals to the consideration of transarterial or percutaneous interventions. We report our technical success and clinical efficacy associated with the percutaneous treatment of endoleak.

Material & Methods: Five patients with aneurysm sac enlargement (> 5 mm in diameter / 6 month) who underwent percutaneous Type 1A endoleak treatment after endovascular aneurysm repair (4 EVAR, 1 TEVAR) were included in this study (mean age: 70.2 years, range: 62-83 years, 4 male, 1 female). In 4 patients, percutaneous transabdominal treatment was performed after failed transarterial attempt (persistant endoleak). Another patient underwent transthoracic percutaneous treatment. All the endoleaks were diagnosed with CT.

Endoleak sac was accessed using 21 G needle under ultrasound and fluoroscopy guidance, followed by the insertion of a minipuncture set over a 0.014 guidewire. Embolization was performed by coils and liquid embolizing agent (N-butyl cyanoacrylate) through the microcatheter.

The time interval between the EVAR and embolization for endoleak treatment was 19.2 months . The median follow-up after endoleak treatment was 11 months. CT was used for the follow-up evaluations to identify the presence or resolution of endoleaks as well as the aneurysm size.

Result: Technical success rate was 100%. One patient died during follow-up (after treatment of a ruptured aortic aneurysm). In other patients aneurysm sac size was reduced or remained stable.

Conclusion: Percutaneus endoleak treatment, is an effective and safe supportive method, after EVAR in appropriately selected patients.

Keywords : Endoleak, Endovascular Aneurysm Repair, TEVAR

Vascular interventional Radiology
SB-18

IN-HOSPITAL MORTALITY OF PATIENTS WITH SPONTANEOUS SOFT TISSUE HEMORRHAGE THAT UNDERWENT TRANSARTERIAL EMBOLIZATION

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[1]Hacettepe University Medical School, Department Of Radiology, Ankara, Turkey

Background/Purpose: Spontaneous soft tissue hemorrhage (SSTH) mostly occurs in elderly patients under anticoagulant treatment with minor to no trauma. This study's aim was to evaluate the rate of in-hospital mortality of patients with SSTH who underwent transarterial bleeding embolization (TBE) and potential predictors of mortality.

Methods: Consecutive patients with SSTH who had active bleeding on CT angiography (CTA) and who underwent TBE were included in this study. Patients with SSTH but no active bleeding on CTA were excluded from the study. Patient characteristics (age, sex), anticoagulant drug status, coagulation tests (INR, PLT, APTT, Fibrinogen) and hemoglobin (Hb) value right before TBE, hematoma location, active bleeding on DSA, the agent used for embolization, the time between CTA and TBE and one-month in-hospital mortality rate were evaluated. Embolic agents are categorized as liquids (glue or EVOH) and coils.

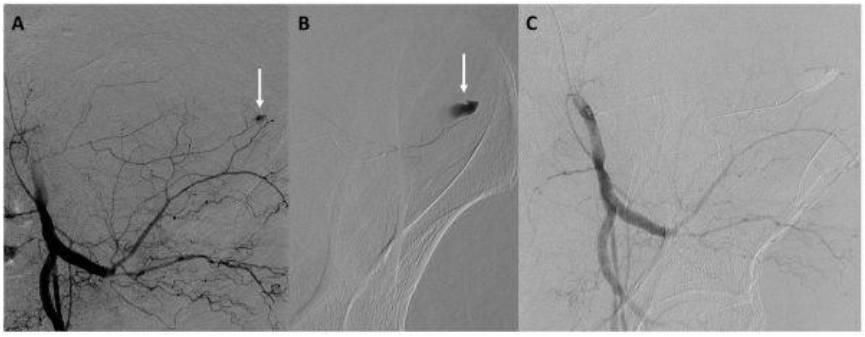
Results: This study included 19 patients, 8 (42.1%) male and 11 (57.9%) female. The median age was 73 years (IQR Q1-Q3: 52-77). Anticoagulant drug statuses of patients were as follows; 10 (52.6%) with heparin, 3 (15.8%) with vitamin K antagonist, 2 (10.5%) with Rivaroxaban, 2 (10.5%) with DIC, 1 (5.3%) with Factor V Leiden and 1 (5.3%) with t-PA. Hematoma locations were iliopsoas in 4 (21.1%), retroperitoneal in 4 (21.1%), anterior abdominal wall in 7 (36.8%), thigh in 3 (15.8%), and calf in 1 (5.3%) patient. Thirteen of 19 patients (68.4%) had active bleeding on DSA. In this study, all patients underwent transarterial embolization regardless of the presence of active bleeding on DSA. In patients with no active bleeding on DSA, the culprit artery was identified based on CTA and embolized. Embolization procedures were performed with coils in 11 (57.9%) patients, with liquid embolic agents in 7 (36.8%) patients, and with particles in 1 patient. The one-month in-hospital mortality rate was 36.8% (7 of 19 patients). The median time to death was 13 days (range 1 to 24). The mortality was not related to sex, age, Hb, PLT, APTT, fibrinogen, active bleeding on DSA, the time between CTA and TBE, and type of embolic agent. The mortality was only related to INR (p=0.004) which was higher in patients with mortality. The medians (IQR Q1-Q3) of INR were 1.66 (1.49-2.3) and 1.17 (1.06-1.35) in patients with and without mortality, respectively.

Conclusion: In patients with SSTH and active bleeding on CTA, one-month in-hospital mortality was high regardless of the presence of active bleeding on DSA and the type of agent used for embolization. In this study, only the pre-TBE INR value was related to mortality.

Keywords : Mortality, Soft tissue, Hemorrhage, Embolization

Figure:

Description of the Figure: Spontaneous iliacus muscle hemorrhage, A) Iliac artery angiography shows active contrast extravasation (arrow) from the iliolumbar artery. B) Contrast extravasation (arrow) can be seen more clearly in superselective angiography that was obtained through a microcatheter. C) Iliac artery angiography shows occlusion of active bleeding and iliolumbar artery with n-BCA.



Vascular interventional Radiology
SB-19

ENDOVASCULAR INTERVENTIONS IN THE MANAGEMENT OF BUDD-CHIARI SYNDROME

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Purpose: To evaluate the effectiveness of therapeutic radiologic interventional procedures in Budd-Chiari syndrome based on a single-center experience.

Methods: A total of 36 patients (23 males, 13 females, average age 35.8) diagnosed with Budd-Chiari syndrome at our center underwent diagnostic inferior vena cavography and hepatic venography. Those with lesions suitable for endovascular intervention underwent therapeutic interventions.

Results: In 9 cases, occlusion was detected in the hepatic veins (HV), in 2 cases occlusion was found at the HV-IVC junction, in 1 case a short segment occlusion was observed in the suprahepatic inferior vena cava, and in 1 case a web was identified at the HV-IVC junction. In 3 cases, there was a narrowing at the HV-IVC anastomosis, in 2 cases a narrowing was found at the HV-IVC junction. In 6 cases, narrowing was detected in the hepatic veins and in 9 cases narrowing was found in the inferior vena cava. Additionally, in 4 cases with HV occlusion, narrowing was found; 3 of these were at the right hepatic vein IVC junction and one was in the HV. Balloon angioplasty, angioplasty, and subsequently stents, metallic stents were used for treatment purposes. In 2 cases, no narrowing was found and only venography was performed, 1 case could not be catheterized, 1 case was unsuccessful, and in 1 case the narrowing could not be opened. In 11 cases, a repeat intervention was required.

Conclusion: The conclusion will be drawn based on the outcomes of the interventions at our center, potentially reaffirming that endovascular treatment is the first choice of therapy for occlusions in the hepatic vein and inferior vena cava, as well as for thrombosis and webs developing in these areas.

Keywords : Budd-Chiari, Angioplasty, Endovascular Interventions

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Vascular interventional Radiology
SB-20

SHORT TERM RESULTS OF EMBOLISATIONS WITH MICROVASCULAR PLUG

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Introduction and Objective: Microvascular plug (MVP) is a mechanical embolising agent and was first used in 2014[1]. MVP is a controlled detachable mechanical embolising agent made of a polytetrafluoroethylene-coated, self-expandable nitinol skeleton connected by a propellant wire[2]. Four different diameters of MVP are available: MVP3, MVP5, MVP7 and MVP9[1]. MVP-3 and MVP-5 can be released from the microcatheter[1]. The aim of this retrospective single-centre study was to share the use of MVP in different indications and to evaluate the short-term clinical outcomes.

Materials and Methods: Between January-2020 and October-2023, 15 patients (mean age: 45.2 years, 4 females, 11 males) who required urgent or elective embolisation in the Interventional Radiology Clinic of Ankara Bilkent City Hospital and used MVP as embolisation material were included. Digital subtraction angiography (DSA) images were obtained without releasing the advancing wire of the MVP and the status of the embolisation was evaluated. In case of incomplete occlusion, embolisation was successfully performed with the additional use of a coil.

Findings: A total of 19 MVPs were used in 15 patients. 7 patients underwent the procedure under emergency conditions and 8 patients under elective conditions. Parenchymal embolisation was performed in 6 patients and vascular embolisation in 9 patients. Parenchymal embolisations were performed to close the splenic and portal access in the transjugular intrahepatic portosystemic shunt procedure, to close the portal vein thrombectomy access and to close the percutaneous transhepatic cholangiography tract. Vascular embolisations were performed in various arterial structures for aneurysm embolisation or active bleeding control. In 9 patients, MVP alone was used, while in 6 patients coils were additionally used for total embolisation. Adequate embolisation was achieved in all patients and technical and clinical success was 100%. No MVP-related complications were observed in any patient.

Discussion and Conclusion: MVP is an effective embolic agent that can be used safely in both parenchymal and vascular embolisation. In addition to the fact that it does not cause thrombosis-dependent embolisation, is retrievable, small diameter ones can be advanced through a microcatheter and does not cause significant artefacts on CT, it also reduces the radiation dose received by the patient and the operator, especially because it has the ability to provide embolisation at one time and thus shortens the procedure time [3]. However, in patients in whom the oversize amount cannot be adjusted correctly or in tortuous vascular structures, additional coils may be required due to the inability of MVT to take the exact shape of the vascular structure.

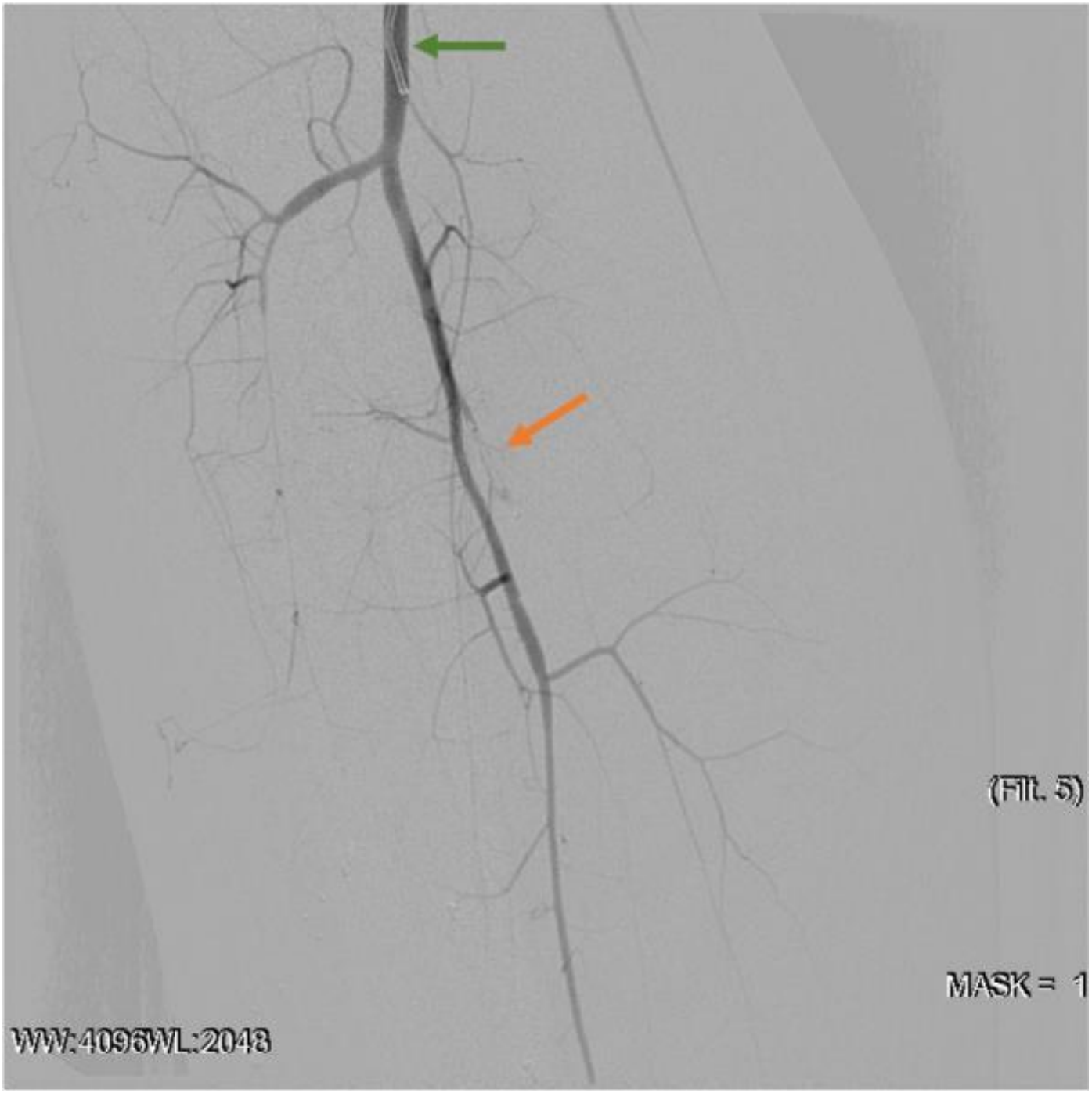
Keywords : Therapeutic Embolization, Extravasation, Bleeding, Aneurysm, Transjugular Intrahepatic Portasystemic Shunt (TIPS),

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Figure:

Description of the Figure: Control DSA examination after MVP embolization shows disappearance of pseudoaneurysm and contrast agent extravasation with MVP (orange arrow) and advancing microcatheter (green arrow).



Description of the Figure: After the TIPS procedure, MVP (orange arrow) was advanced through the advancing microcatheter (green arrow) to close the splenic access.



Description of the Figure: In the control DSA image obtained after closure of the splenic access with MVP after the TIPS procedure, it was observed that the opaque material delivered through the catheter did not reach the parenchyma.



Description of the Figure: Embolization with MVP was planned in a patient with pseudoaneurysm and extravasation in the posterior tibial artery after gunshot injury.



Vascular interventional Radiology
SB-21

IMAGE-GUIDED DRUG DELIVERY AND ABLATION OF THE PROSTATE FOR THE TREATMENT OF BENIGN PROSTATIC HYPERPLASIA AND PROSTATE CANCER

Rahmi Oklu[1], Yusuf M Demirlenk[1], Hassan Albadawi[1], Zefu Zhang[1], Chris Keum[1], Dila Atar[1], Enes Çevik[1], Jinjoo Kim[1], Suliman Rehman Khan[1], Seyda Gunduz[1], Erin Graf[1], Pedro Reck Dos Santos[1]
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Aim: Benign prostatic hyperplasia (BPH) and prostate cancer are associated with significant morbidity, severely impacting the patient's quality of life resulting from lower urinary tract symptoms. They are highly prevalent worldwide, with considerable burden on the healthcare system and society. Current BPH treatments, including medical and surgical therapies, have numerous drawbacks. Addressing this challenge, we developed and optimized an innovative office-based approach to ablate prostate tissue while concurrently delivering therapeutic agents. This needle-based ultrasound-guided delivery of PADA, which comprises a class of ionic liquids mixed with therapeutics, is injected directly into the prostate under ultrasound guidance; it is an approach that is simple to perform with high precision and a high safety profile.

Materials and Methods: A novel ionic liquid formulation was optimized and tested *in vitro* for prostate cancer cell viability and visibility under real-time x-ray imaging, its capability to deliver small molecule surrogates and immunotherapeutics in prostate tissue mimicking matrix. Rigorous *ex vivo* and *in vivo* analyses were performed using patient-derived tissues, murine animal models of prostate cancer, and large animal models, including survival and non-survival canine models, to assess local tissue ablation and drug delivery.

Findings: Through extensive *in vitro*, *ex vivo*, and *in vivo* testing, including human tumor samples, small and large animal models, the formulation was shown to have high efficacy with uniform prostate ablation and drug delivery, such as Nivolumab, which is a common immunotherapy drug. The formulation was also shown to exhibit strong antibacterial properties against highly resistant bacteria isolated from patients, potentially mitigating the risk of infections associated with prostate interventions. In canine survival experiments, the formulation demonstrated consistent prostate ablation and uniform delivery of therapeutics that remained in the ablation zone with no adverse events; it had no impact on the ability to urinate. These findings suggest that our formulation is a safer and more effective alternative to existing approaches to treating BPH and PCa, which can have significant side effects such as incontinence, sexual dysfunction, and long-term catheter use to urinate.

Conclusion: PADA represents a novel injectable agent for the ablation of prostate tissue while delivering clinically used drugs, i.e. Nivolumab, representing an easy-to-use, biocompatible alternative to TURP and PAE.

Vascular interventional Radiology
SB-22

RISK FACTORS AND OUTCOMES OF TRANSCATHETER EMBOLIZATION IN REFRACTORY ACUTE UPPER GASTROINTESTINAL HEMORRHAGE: A RETROSPECTIVE ANALYSIS

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Background & Aims: Acute upper gastrointestinal bleeding (UGIB) represents a significant medical emergency, introducing diagnostic and therapeutic challenges, particularly when standard endoscopic methods prove inadequate. Transcatheter embolization (TCE) emerges as a potential therapeutic modality; however, the factors dictating its angiographic outcomes remain to be fully understood. This study aimed to identify the risk factors linked with recurrent UGIB episodes within 30 days post-TCE in refractory cases.

Methods: In this retrospective study, we examined 56 consecutive transcatheter embolization (TCE) procedures performed for upper gastrointestinal bleeding between June 2021 and June 2023. The cohort included 44 male and 12 female patients, averaging 69.4 years of age, all of whom had undergone selective angiography and embolization due to unsuccessful endoscopic interventions. We conducted a systematic evaluation of variables that might impact early rebleeding.

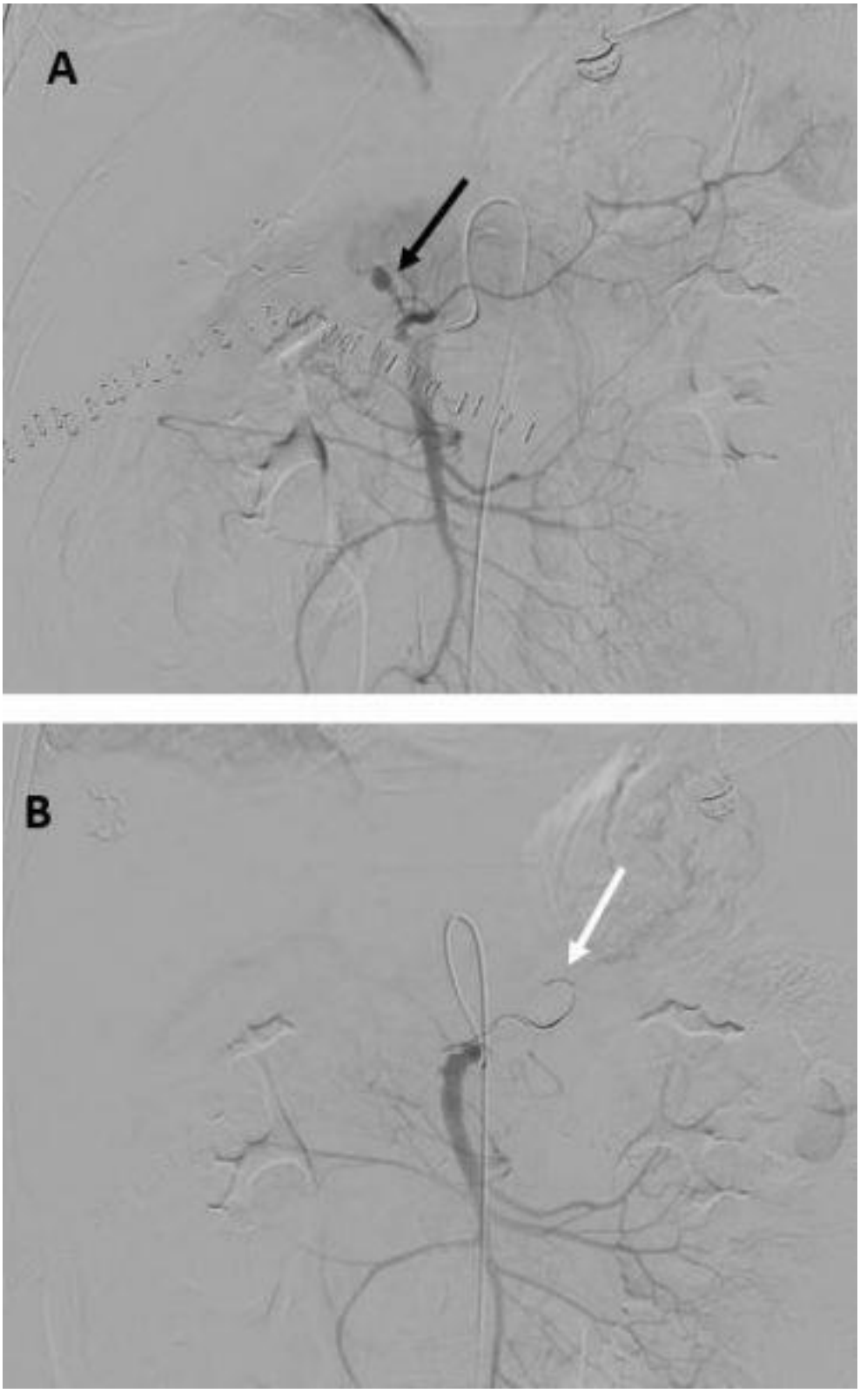
Results: With a technical success rate of 100% and a clinical success rate of 60.8%, the primary causes of UGIB included malignancies (23.2%, n=13), idiopathic origins (23.2%, n=13), and ulcers (21.4%, n=12). The gastroduodenal artery was the most frequently embolized vessel (58.9%, n=33), with vascular irregularities being the predominant angiographic observation (28.6%, n=16). Notably, 39.2% of patients experienced early rebleeding within the 30-day period. There were no significant complications related to catheterization. Delayed angiography (P = 0.026), the presence of multiple comorbidities (P = 0.034), and embolization in two or more vessels (P = 0.021) were all significantly correlated with early rebleeding.

Conclusions: Timely angiographic embolization is essential, particularly for critically ill patients, to ensure optimal bleeding control. The results highlight the importance of prompt interventions. Careful consideration is warranted when simultaneous embolization of more than two vessels is undertaken, and in cases with multiple comorbidities, as these factors could be indicative of an increased risk for recurrent bleeding.

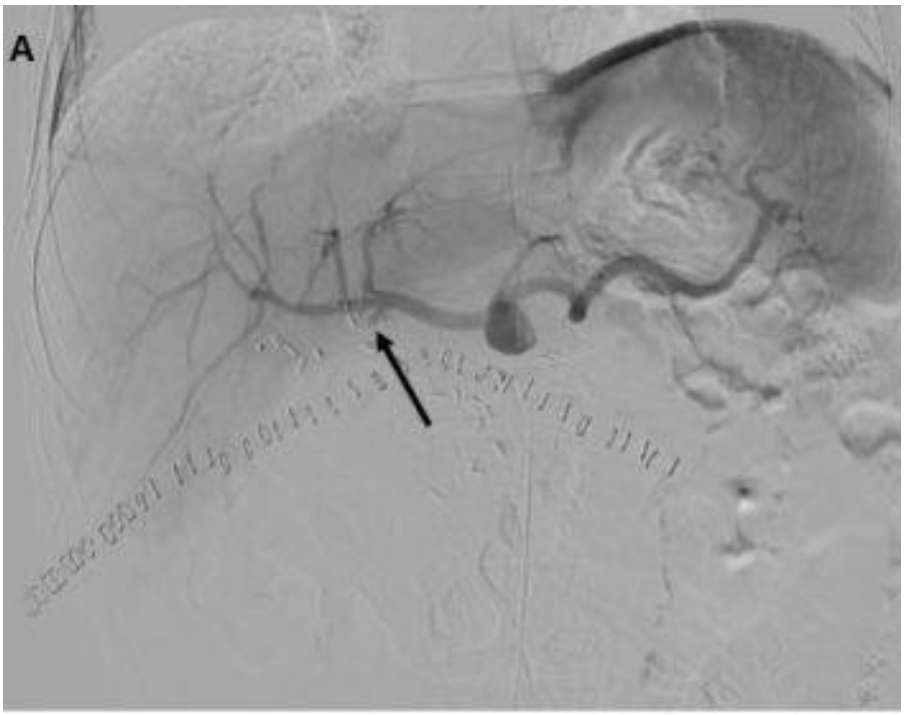
Keywords : gastrointestinal hemorrhage, Endoscopy, Angiography, Embolotherapy

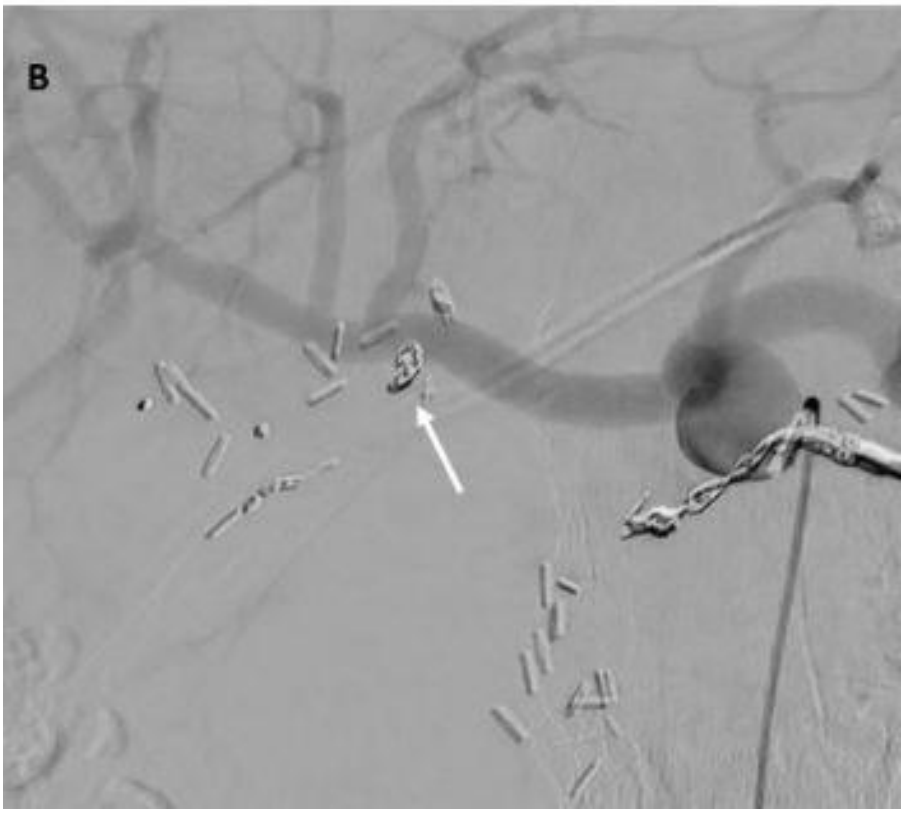
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Description of the Figure: Figure 1: A 61-year-old male patient, referred to us post-Whipple procedure due to upper gastrointestinal bleeding and hemodynamic instability. A) Extravasation observed from a branch of the superior mesenteric artery (black arrow) originating from the inferior pancreaticoduodenal artery. B) The actively bleeding branch was successfully occluded with coil embolization, and subsequent imaging showed resolution of the extravasation



Description of the Figure: Figure 2: The same patient depicted in Figure 1 presented 10 days after the initial embolization procedure with recurrent upper gastrointestinal bleeding from a branch of the previously embolized inferior pancreaticoduodenal artery. Angiographic evaluation in figure 2 A revealed no distinct pathology at the stump of the gastroduodenal artery, as highlighted by the black arrow. Despite the absence of other discernible pathologies, coil embolization was performed at the stump. Subsequent imaging in figure 2B indicated no contrast filling at the embolized site, and follow-up monitoring confirmed the absence of recurrent bleeding in the patient.

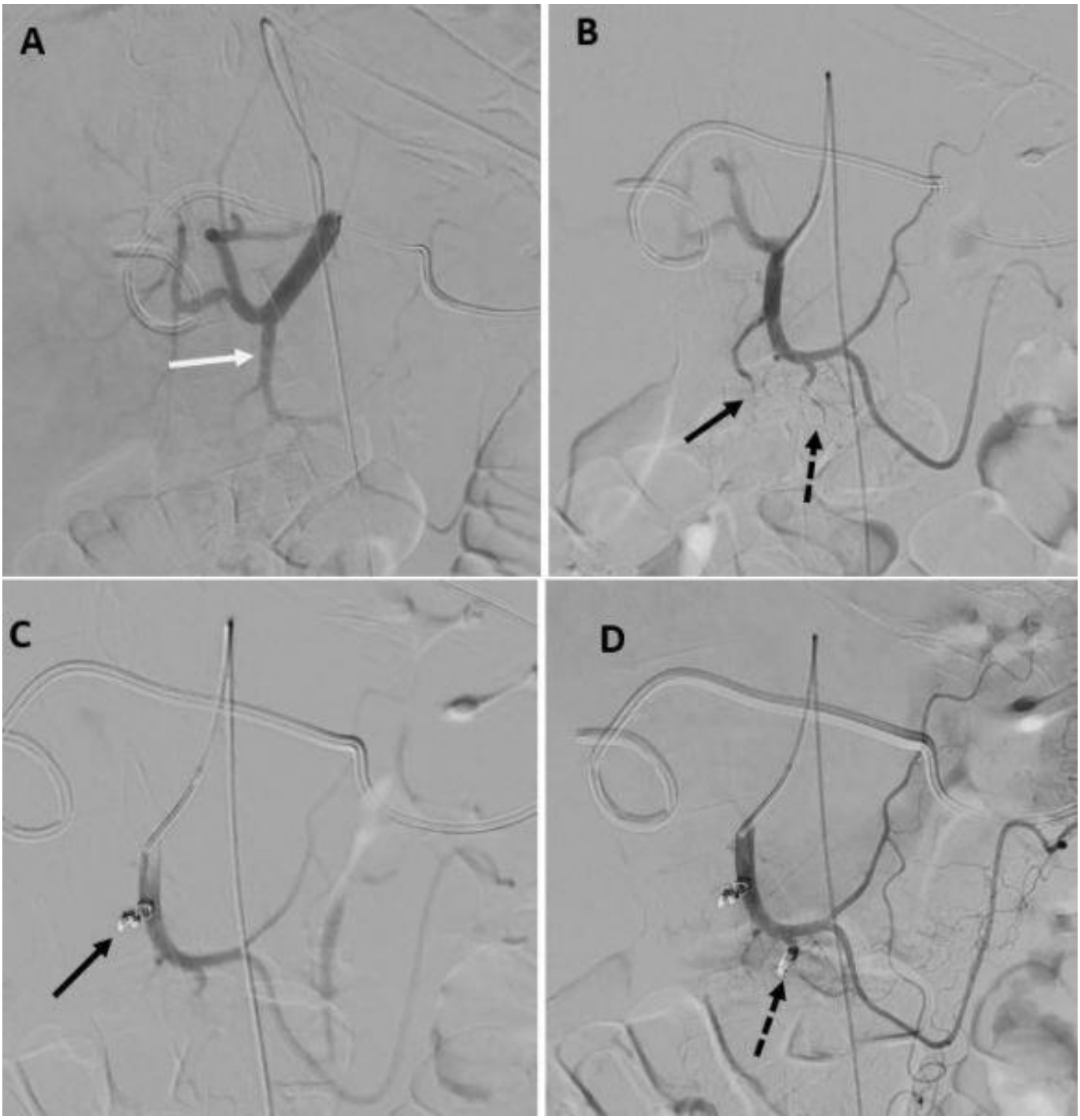




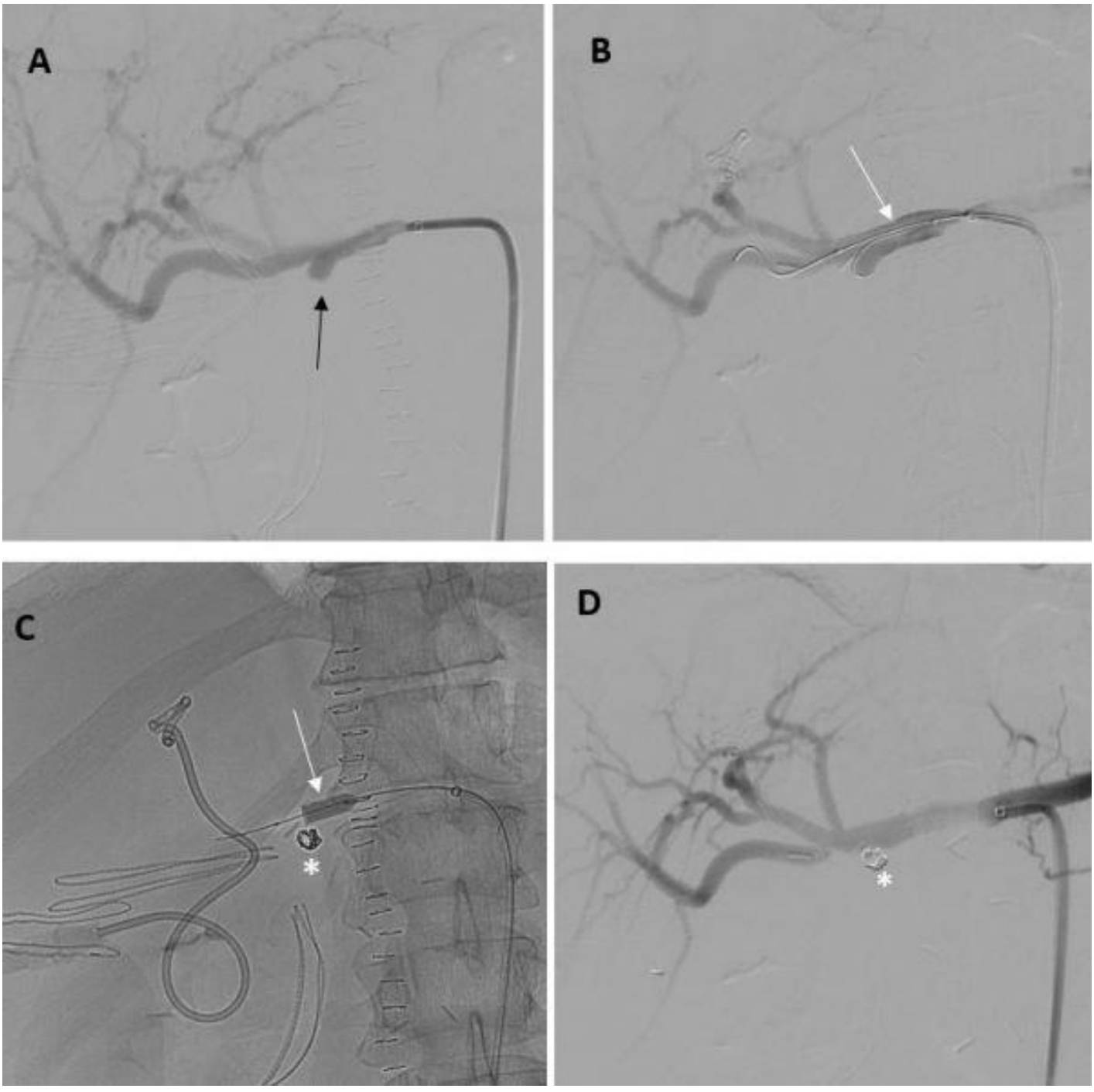
Description of the Figure: Figure 3: A 65-year-old patient with a periampullary region tumor. (A) T2-weighted MR imaging reveals a mass in the periampullary region (BLACK ARROW). (B, C) Superior mesenteric angiography depicts contrast enhancement (blush) suggestive of the tumor, originating from the inferior pancreaticoduodenal artery (WHITE ARROW). (D) Post-coil embolization imaging (ASTERISK) confirms the absence of tumoral contrast enhancement.



Description of the Figure: Figure 4: 67-year-old male patient consulted us due to an unresponsive duodenal ulcer bleeding post-endoscopy. Angiographic evaluation revealed contrast filling of the gastroduodenal artery (A, WHITE ARROW). Subsequent images after catheterization displayed irregularities and abrupt discontinuation in the superior pancreaticoduodenal artery (BLACK ARROW) and the right gastro-omental artery (DOTTED ARROW). In (C), coil embolization of the superior pancreaticoduodenal artery (BLACK ARROW) and in (D), coil embolization of the right gastro-omental artery (DOTTED ARROW) were performed, effectively controlling the massive upper gastrointestinal bleeding.



Description of the Figure: Figure 5: A 53-year-old male patient was referred to us on the 3rd day post-Whipple procedure due to gastrointestinal bleeding. Despite no pathological findings on preoperative endoscopy and receiving three units of packed red blood cell transfusions, the patient exhibited hemodynamic instability. Angiographic evaluation did not reveal any distinct pathology at the stump of the gastroduodenal artery (indicated by the black arrow in A). Given the broad base of the stump, a decision was made for balloon-assisted coil embolization (highlighted by the white arrow in B). Following balloon inflation at the level of the stump (indicated by the white arrow in C), the stump was successfully embolized with coils (as denoted by the asterisks in C). Subsequent imaging (D) showed no filling at the embolized stump



Tables:

Table 1.Comparison of Clinical Parameters and Outcomes Between Patients with and without Recurrence Following Transcatheter Embolization

n (%)	No recurrence n =34	Recurrence present n=22	P value
Mortality Absent Present	21 (61,8) 13 (38,2)	8 (36,4) 14 (63,6)	0,063
Sex Female Male	10 (29,4) 24 (70,6)	2 (9,1) 20 (90,9)	0,067
Diagnosis 1 Ulcer 2 Malignant Mass 3 Pancreatitis 4 Postoperative 5 Idiopathic 6 Varices 7 Angiodysplasia 8 UK (Unknown) 9 Postop Whipple	7 (20,6) 5 (14,7) 2 (5,9) 6 (17,6) 8 (23,5) 0 1 (2,9) 1 (2,9) 4 (11,8)	5 (22,7) 8 (36,4) 0 1 (4,5) 5 (22,7) 1 (4,5) 0 0 2 (9,1)	0,360
Surgical history Absent Present	24 (70,6) 10 (29,4)	19 (86,4) 3 (13,6)	0,172
Whipple surgery Absent Present	30 (88,2) 4 (11,8)	20 (90,9) 2 (9,1)	0,752
Comorbidity None-One Two or Above	31 (91,2) 3 (8,8)	15 (68,2) 7 (31,8)	0,034*
Embolised Vessel Outside of GDA (Gastroduodenal Artery) GDA	14 (41,2) 20 (58,8)	9 (40,9) 13 (59,1)	0,984
Embolised Vessel One Two or more	30 (88,2) 4 (11,8)	13 (59,1) 9 (40,9)	0,021*
Embolisation Blind According to Angiographic Findings	8 (23,5) 26 (76,5)	8 (36,4) 16 (63,6)	0,299
Embolisation Method Only with Coil More Than Two Materials	29 (85,3) 5 (14,7)	19 (86,4) 3 (13,6)	0,911
Surgical Need Post-Procedure None Present	34 (100) 0	14 (63,6) 8 (36,4)	<0,001
Complication Absent Present	31 (91,2) 3 (8,8)	21 (95,5) 1 (4,5)	0,544
Coagulopathy Absent Present	26 (76,5) 8 (23,5)	14 (63,6) 8 (36,4)	0,299
Immunosuppression Absent Present	33 (97,1) 1 (2,9)	18 (81,8) 4 (18,2)	0,072
Age (Median (min-max))	56,5 (16-85)	58 (30-88)	0,533
Lactate (mmol/l) (Median (min-max))	1,7 (0,6-24)	2,2 (0,5-12,7)	0,737
Days Between Bleeding and Angiography (Median (min-max))	1 (0-9)	2 (1-23)	0,026*
Packed Red Blood Cells before procedure (Median (min-max))	4 (1-19)	7 (1-27)	0,085
Hb (g/dl) (Median (min-max))	7,4 (3,6-11)	7,4 (4,2-10,3)	0,551
Htc (Median (min-max))	23,1 (11,8-33)	22 (11,8-31,1)	0,148

Vascular interventional Radiology
SB-23

INTRAVASCULAR STENTS OR STENT-GRAFTS FOR THE ENDOVASCULAR TREATMENT OF AORTO-ILIAC OCCLUSIVE DISEASE

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Purpose: To report a single-center experience of endovascular treatment of aorto-iliac occlusive disease (AIOD) with TransAtlantic Inter-Society Consensus II (TASC II) C and D lesions.

Methods: Endovascular treatment of aorto-iliac occlusive disease were performed in 123 patients (mean age 66 years; 104 men, 19 women) with 157 stents and/or 72 stent-grafts

The lesions were as follows;

(İmage 1 and İmage 2)

Demographic, clinical, and procedural data were also analyzed.

Results:

Successful deployment of the endovascular stents / stent-grafts were achieved in all patients. Technical success was 100% with no procedural morbidity. In 12 cases, complications such as extravasation and dissection that occurred during the procedure were eliminated by additional balloon, stent or stent-graft applications in the same session.

Six minor complications such as hematoma / pseudoaneurysm at the puncture site were treated with mechanical compression .

Conclusion: According TASC II recommendations, surgery is the preferred treatment for type C and D lesions. However, there are also reports of endovascular treatment of type C and D lesions. Our study reveals that endovascular treatment has high rates of technical and clinical success, offering an alternative to surgical treatment, which used to be the only option for these patients. It can be successfully used for patients with comorbidities that make them unsuitable for surgery.

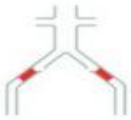
Keywords : stenosis, occlusion; aneurysm; stent-graft; covered stent; endovascular treatment; stent-graft; iliac artery.

References :

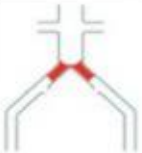
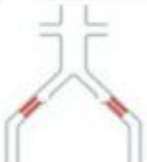
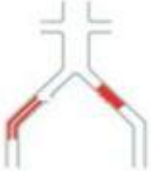
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Figure :

Description of the Figure: image 2

D, a		Infra-renal aortoiliac occlusion	12
D, b		Diffuse disease involving the aorta and both iliac arteries	19
D, c		Diffuse multiple stenoses involving the unilateral CIA, EIA and/or CFA	23
D, d		Unilateral occlusions of both CIA and EIA	24
D, e		Bilateral occlusions of EIA	3
D, f		Iliac stenoses + AAA not amenable to endografting	3

Description of the Figure: image 1

TASC II types		Lesion	Number of patients
C, a		Bilateral CIA occlusions	4
C, b		Bilateral EIA stenoses 3 -10 cm NO CFA extension	12
C, c		Unilateral EIA stenosis extending into the CFA / Unilateral EIA occlusion involving the origins of the IIA or CFA / Heavily calcified unilateral EIA occlusion ± involvement of the origins IIA and/or CFA	23

Non-Vascular interventional Radiology
SB-25

AN OVERVIEW OF TRANSTHORACIC NEEDLE BIOPSIES; COMPLICATIONS AND PITFALLS

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Purpose: Imaging-guided needle biopsies are used to diagnose lung lesions and have a high success rate with acceptable complication rates. Choosing the appropriate guidance method, avoiding risk factors that can lead to complications, and being aware of factors reducing the procedure's success are all critical considerations

Material and Method: In this study, 307 patients underwent transthoracic fine needle aspiration biopsy guided by computed tomography (CT) and ultrasonography (US). 242 of these were male, and 65 were female. CT guidance was used in 225 procedures, while US guidance was used in 82. US was preferred for lesions with a broad pleural base and easy access; while CT was chosen for better anatomical orientation in conditions where there was no pleural base or a narrow pleural contact. The needle was carefully traced to avoid passing the fissure and bullae. A 20-gauge needle was used in 299 patients, an 18-gauge needle was used in 4, and coaxial needle with an external entry needle of 18-gauge and an internal cutter needle of 20-gauge thickness was used in 4

Findings: The occurrence of pneumothorax in pleural-based lesions was a rare complication. However, in cases where the needle trace passed through the lung parenchyma, 36.2% of patients developed pneumothorax, and 7 (18.9%) required a chest tube. In 50 of 102 patients with lesions that did not have a pleural base, centriacinar emphysema or paraseptal emphysema in the needle trace was present. Among these patients, 19 (38%) of them developed pneumothorax, and 6 (31.5%) required a chest tube. In contrast, 18 (34.6%) of 52 patients without emphysema developed pneumothorax, and only 1 (5.5%) of them required a chest tube. The risk of pneumothorax and the need for a chest tube increased as the distance of the lesion from the pleura increases. Of the 54 in 102 lesions that did not have a pleural basis, developed linear or diffuse alveolar hemorrhage in the needle trace. Among these patients, 12 (22.2%) developed pneumothorax, and only 1 (8%) required a chest tube. On the other hand, of the 48 patients who did not develop hemorrhage, 27 (56.2%) developed pneumothorax, and 6 (22.2%) had a chest tube inserted. No hemorrhage developed in any of the pleural-based lesions

266 patients (86.7%) could be diagnosed pathologically. Among the undiagnosed lesions, 12 (29.2%) showed visible necrosis in radiologic images or presence of necrosis stated in pathology reports.

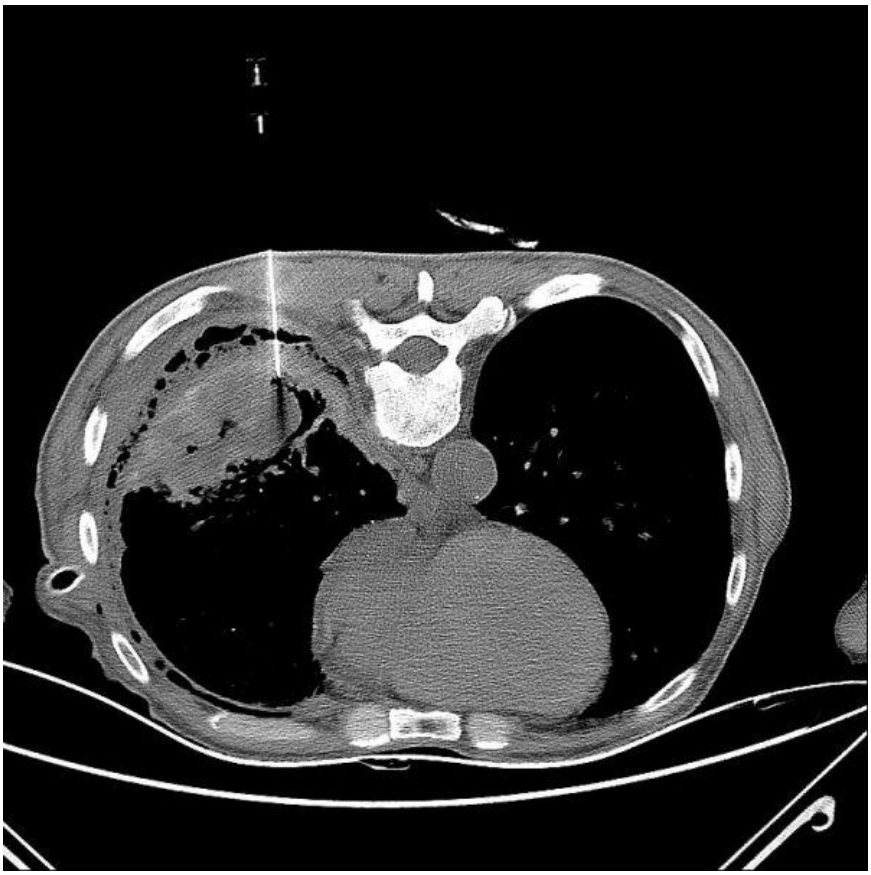
Result: The most important complication in needle biopsies is pneumothorax. This complication is more common in patients with non-pleural-based lesions and emphysema. The emphysema is a patient-related factor, can also increase the severity of pneumothorax and the need for chest tube. The pneumothorax risk is higher when the lesion is farther from the pleura. Iatrogenic hemorrhage can prevent both pneumothorax and the need for a chest tube. The presence of necrosis in the lesion is the main factor that reduces the success of the procedure.

Keywords : transthoracic biopsy, fine needle, pneumothorax

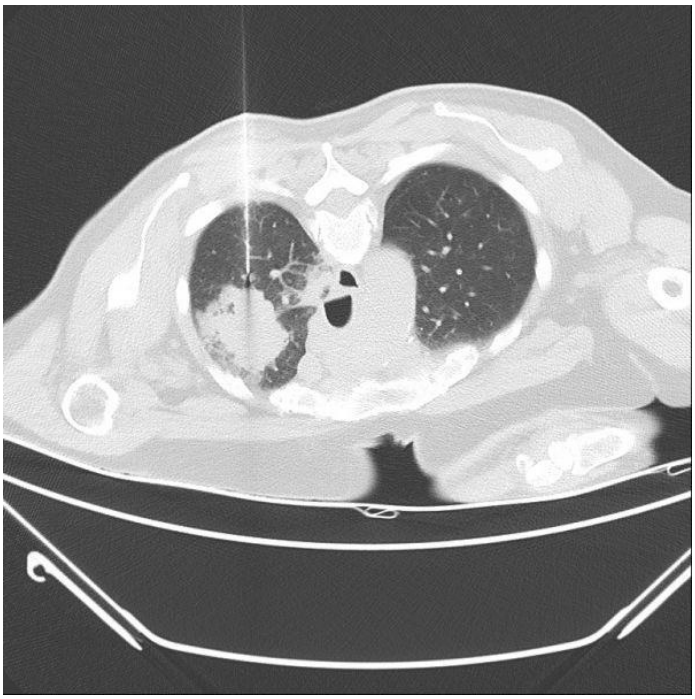
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Figure:

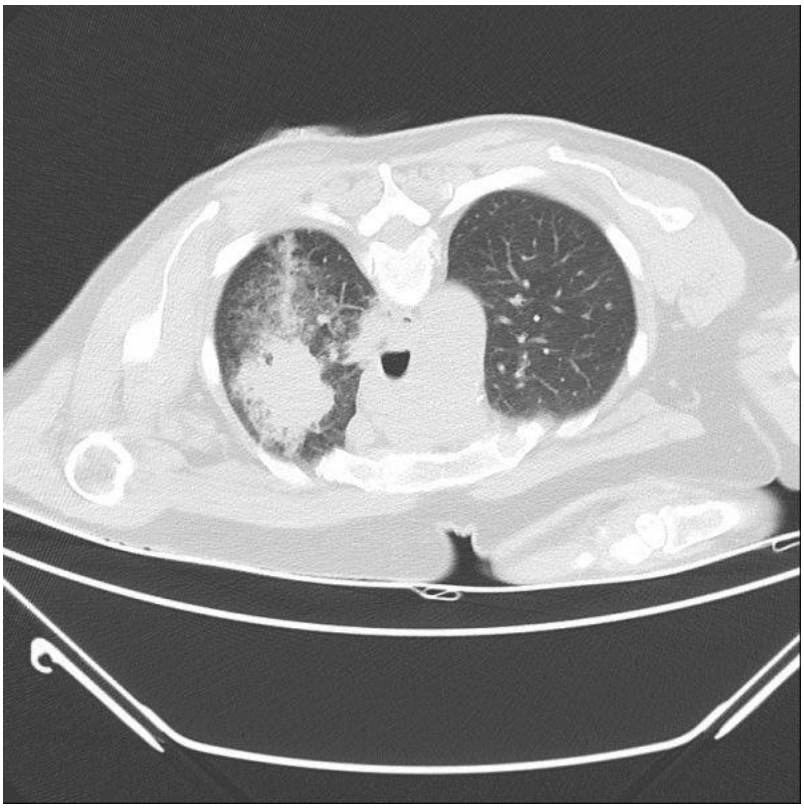
Description of the Figure: biopsy was taken from the wall of the largely necrotic mass



Description of the Figure: vascular structure in the needle path



Description of the Figure: due to vascular pass wide hemorrhage developed



Tables :

General data of procedure

	Pleural-based	Non-pleural-based
Guide method		
CT	124	101
US	81	1
Pneumothorax	2	37
Chest tube need	0	7
Hemorrhage	0	54

Non-Vascular interventional Radiology
SB-26

RADIOFREQUENCY ABLATION OF OSTEOID OSTEOMA UNDER CONE BEAM CT : DOSE ASSESSMENT AND CLİNİCAL OUTCOMES

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[1]Izmir Tepecik Suam Research And Training Hospital, Department Of Radiology
[2]Izmir Dokuz Eylül University Hospital Department Of Radiology

Purpose: To assess if RF ablation of osteoid osteoma under cone beam CT (CBMT) can reduce radiation dose, fluoroscopy time, and procedure time compared to conventional CT. Also, to assess the safety and efficacy of the procedure with help of visual analog score (VAS), postoperative MRI and CT imaging

Materials and Methods: 19 patients who underwent RFA under CBMT at our clinic between 2019-2023 were analyzed and total radiation doses(dose area product)(DAP)and effective dose (ED), fluoroscopy and procedure time were recorded. In addition, these patients were followed up with postoperative MRI and CT and they were assessed clinically with visual analog score (VAS) for finding out clinical efficacy.

Results: Our mean procedure time was 43 minutes, mean DAP was 26.73 Gycm2 , mean ED was 0.27 mSv and mean fluoroscopy time was 6.8 minutes. Technical success was %100, no major complications were recorded and one minor complication was recorded during the follow-up period (intramuscular hematoma). One tumor was retreated at 4 months because of pain persistence.

Conclusion: Radiofrequency ablation of osteoid osteoma under CBCT is a safe and effective technique. CBCT guiding can lower patient and operator radiation dose compared to conventional CT.
Keywords : osteoid osteoma, ablation therapy, cone beam CT, doze area product (DAP), effective dose (ED)

Tables:
Table 1: Demographic and procedural clinical statistics

AGE	GENDER	DAP (Gycm2)	ED (mSv)	PROCEDURE TİME (Min)	FLOUROSKOPY TİME (Min)
14	E	89.9	3.2	37	10
15	E	26.6	0.95	30	5.7
17	E	17.7	0.64	24	4.8
19	E	12.6	0.45	44	4.9
15	E	16.4	0.59	53	6.5
15	E	33.8	4.39	87	11
14	K	19.1	0.68	42	3.3
10	E	21.2	0.76	33	5.8
5	E	20.1	0.72	24	4.1
16	E	56.6	2.03	29	5.2
17	E	39.6	1.42	25	6.4
17	E	15.8	1.01	75	10.4
10	E	15.2	0.97	61	4.3
17	E	39.4	1.42	39	7.7
18	K	26.3	0.94	33	9.9
25	K	10.7	0.38	28	4.8
12	E	12.8	0.46	38	5.3
23	E	15.1	0.54	35	7.3
13	E	23.2	1.48	43	11
15	K	22	0.79	85	8.2
MEAN: 15.3	E:17, K:4	MEAN:26.7	MEAN:1.19	MEAN: 43.25	MEAN: 6.83

Non-Vascular interventional Radiology
SB-28

THE EVALUATION OF EFFICACY OF PRP WITH MRI ARTHROGRAPHY IN PARTIAL ARTICULAR SURFACE SUPRASPIANTUS TEARS: PRELIMINARY RESULTS

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Introduction: Supraspiantus tendon tears comprise the vast majority of rotator cuff tears [1]. In respect to treatment modaliy, there a vast array of approaches ranging from conservative survaillance to physiotheraphy and surgical operations. The recent data in the literature shows a shift toward more cost-effective as well as minimal invasive procedures including but not limited to ultrasound-based plasma-rich platelet injection [2-5].

The aim of this study is to evaluate patients with articular surface partial supraspinatus tendon tear undergone platelet rich plasma with MRA and to compare long-term effectiveness of PRP intervention with control group that undergone conservative physiotheraphy only.

Materal&Methods: Overall 50 patients (n=25 case and n=25 control group) were recrutied in this study with demographics of 25-65 years of age and wtihout a clinical history of trauma, chronic disease and/or surgical history to the affected joint. All subjects evaluated with real-time ultraonography referred with possible clinical suspicion of rotator cuff inury by orthopedists. Patients having supraspinatus tear confied to supraspinatus articular sruface were included. Subsequently, all subjects underwent MRI arthorgraphy (MRA) to confirm USG-based diagnosis and patients having tear and/or degeneration attributblre to other entities were excluded. Twenty five patients underwent PRP intervention with informed conset (case group) and the other half (n=25, control group) were followed up with conservtive tratrment by physiotheraphy. In average all subjects were followed-up 6 motnhs. Secondary MRA were performed 4-6 motnhs following treatment to assess healing process and the results were recorded. Statistical analysis was perfomed using *t*-test and Wlicoxon analysis utilising SPSS v.20.

The study was approved by Ethics Committee of the Atatur University Research Hospital wi,th the pursuant number B.30.2.ATA.0.001.00543 and was also approved for Scientific Research Project.

Results: The mean age of the study population was 39.5 ±6.76 and male to female ratio was 2.67. The pre-procedural mean diameters of the tears measured in mediolateral, anteroposterior and craniocaudal directions were 5.26±2.28, 3.73 ± 1.59 and 2.48 ± 0.34 mm, respectively. Same measurements taken after treatment was 4.30± 1.98, 2.60± 1.43 and 1.97 ± 0.86 mm. Extensions of tears were regressed significantly in all directions (p = 0.006, 0.028 and 0.020, respectively). The median Visual Analogue Score (VAS) before and after the procedure were 6 (5–7) and 4 (2–5) respectively. The median VAS score decrement was statistically significant in the post-treatment assessment (p=0.003).

Conclusion: This study is the first to assess and compare effectiveness of PRP with gold-standart MRA of partial articular surface supraspinatus tendon tears in patients undergoing conservative physiotheraphy and the results show stastistically significant in PRP group comparted to control.

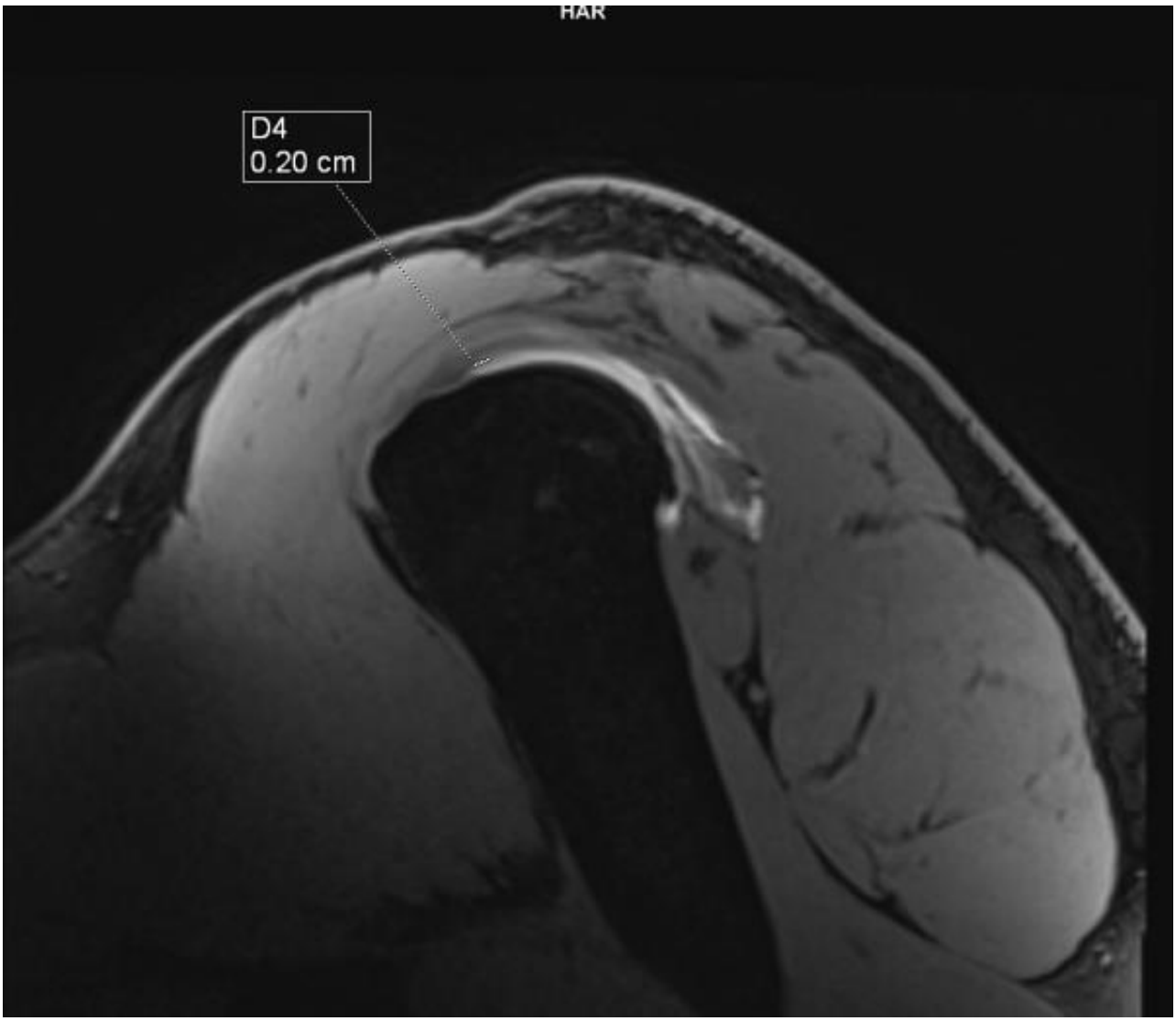
Keywords : Magnetic Resonance Arthrography, Ultrasound, Rotator Cuff Tear

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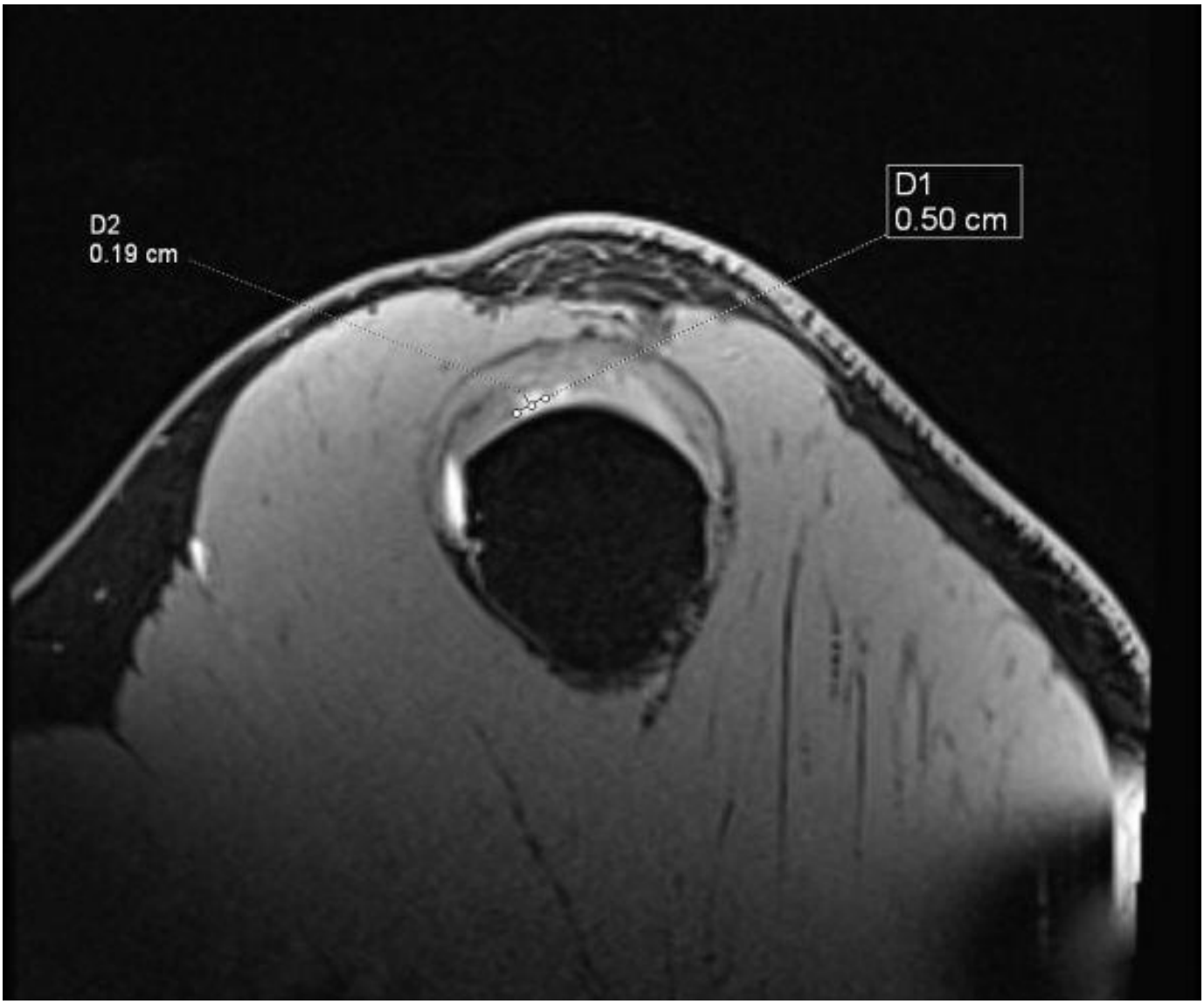
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Figure:

Description of the Figure: The same patient's post-PRP MRA depicts decrement of tear dimension



Description of the Figure: In 35 years old male patient sagittal MRA shows antero-posterior dimension of supraspinatus articular surface tear prior to PRP treatment



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SIMULTANEOUS ASPIRATION AND MICROWAVE ABLATION OF SYMPTOMATIC HEPATIC CYSTS TREATMENT

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Abstract: This study investigates the efficacy of simultaneous image-guided aspiration and microwave (MW) ablation in treating symptomatic hepatic cysts, aiming to reduce cyst volume and alleviate symptoms without the risk of sclerosan leakage to the biliary and vascular tract.

Background: Simple hepatic cysts (SHC) are prevalent benign liver lesions, often found incidentally (18%) on abdominal CT imaging. SHC, more common in women, increase with age and are congenitally linked to aberrant bile ducts. Differential diagnosis from other liver conditions is crucial, especially when imaging reveals septations indicative of malignancy.

Treatment Overview: While most benign hepatic cysts are asymptomatic, large or symptomatic cysts necessitate treatment. Current guidelines recommend laparoscopic cyst deroofing, but percutaneous aspiration and sclerotherapy (PAS) offer a less invasive alternative. Percutaneous ethanol ablation, as an alternative or first-line treatment, and radiofrequency (RF) ablation using a cooled electrode after aspiration have been employed.

Objective: This study focuses on MW ablation with a cooled electrode for simple hepatic cysts, combining it with simultaneous aspiration to enhance efficacy and decrease ablation time.

Methods: A retrospective analysis of image-guided aspiration and MW ablation procedures was conducted. Eleven patients (mean age 57.4) underwent 12 ablations between June 2019 and January 2023. Pre- and post-procedural symptoms, imaging, and complications were analyzed. Procedures were performed under conscious sedation, and a 21-gauge Chiba needle was used for aspiration followed by MW ablation.

Results: The average processing time was 9.6 minutes, with an average power of 93 W. Initial cyst dimensions (mean diameter 8.3 cm) significantly reduced after MW ablation. Follow-up CT scans (32–365 days) showed a greater than 90% reduction in cyst volume in all cases. Intracystic hematoma occurred in 2/12 procedures (15%) without intervention. Symptom relief was significant in all patients within six months.

Conclusions: Simultaneous MW ablation and aspiration, guided by ultrasound, effectively reduce liver cyst volume and alleviate symptoms in symptomatic liver cysts. The technique ensures complete reduction of the cyst walls' epithelial lining, contributing to a complication-free postoperative period. Advantages include minimally invasive, targeted destruction, and no risk of sclerosing substance leakage into the biliary or vascular tract.

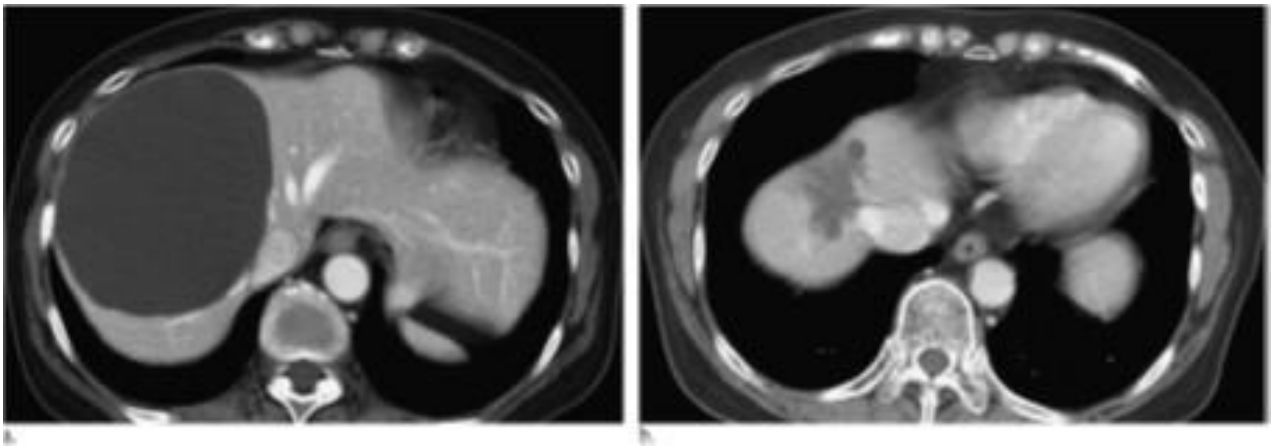
Keywords : Simple hepatic cysts, Microwave ablation, Aspiration

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Figure:

Description of the Figure: CT Scan Images of Liver Cyst Before and After Microwave Ablation with Simultaneous Aspiration



Description of the Figure: Ultrasound Image During Microwave Ablation of Hepatic Cyst



Non-Vascular interventional Radiology
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TRANSGLUTEAL CT-GUIDED PERCUTANEOUS DRAINAGE OF PELVIC ABSCESS AFTER POSTOPERATIF MALIGNANCY SURGERY

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Introduction: In this study, we aimed to evaluate the efficacy, safety, and outcomes of CT-guided percutaneous drainage of postoperative pelvic collections.

Materials and Methods: During four year period, 32 patients(18 female, mean age,51.1 ±11.4 years) with 36 pelvic abscesses underwent percutaneous drainage treatment after the postoperative period. All the procedures were performed with the CT guidance. Thirty-two fluid collections were associated with the postoperative period due to malignancies of colorectal (n:22), and ovarian (n: 8), and Cervical cancer (n:2). All the procedures were performed with the Seldinger technique on prone position. Local anesthesia was preferred, and sedation was performed in needed cases. 10-16F drainage tubes were selected depending on the collection characteristic.

Results: Technical and clinical success rates were 100 and 90%, respectively. Median Abscess volume was 125,8 ml. Seventeen abscess cavities were complex, including septation and multilocular structure. No procedural-related major complications occurred. The median duration of catheter use was nine days (3–46 days). Four patients' abscesses had fistula communication with the gastrointestinal system treated with prolonged catheter drainage. In three patients with clinical failure, were mortality secondary to the septic process (n=2) and need for open surgery (n=1). In 4 patients, abscesses were recurred and treated with successful percutaneous drainage.

Conclusions: Transgluteal CT-guided percutaneous catheter drainage is a safe and effective treatment in postoperative collections after malignancy surgery. The main cause of prolonged recovery is the presence of the abscess cavity fistula. Drainage catheter care and, in selective cases, repeated drainage is needed to achieve clinical success.

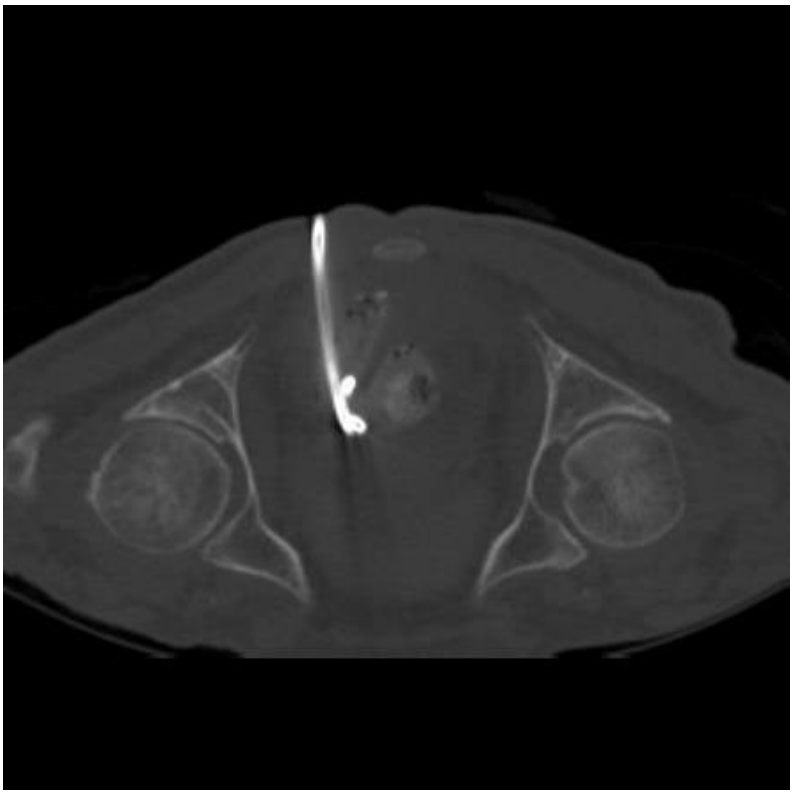
Keywords : abscess, postoperative complications, CT guided percutaneous drainage

Figure:

Description of the Figure: CT scan shows a 18-gauge needle advanced into the abscess cavity by using a transgluteal approach.



Description of the Figure: CT scan shows drainage catheter was inserted into the abscess cavity.



Description of the Figure: Fluoroscopic drain study shows fistulous tract to the colon.



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A DIFFERENT APPROACH TO SCLEROTHERAPY OF ANEURYSMAL BONE CYST; MODIFIED TESSARI (MT) TECHNIQUE

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[1]Dicle University Faculty Of Medicine Department Of Radiology

Introduction: Sclerotherapy is an alternative to surgery in the treatment of aneurysmal bone cyst, and similar treatments are becoming increasingly popular. The tissue diagnosis of aneurysmal bone cyst sometimes cannot be determined and treatment is performed based on clinical-radiological data (1). Our aim is to share with you two cases in which we applied sclerotherapy with a different technique.

Cases: The first is a 10-year-old male patient. There was a complaint of thinning in the left leg compared to the right and pain in the left knee. There was no feature in labaratory. There was a benign cystic lesion in the CT and MRI scan (Figure 1,2). The image was non-specific and the biopsy was non-diagnostic. Our second case was a 32-year-old male patient who complained of pain in the right hip. There was no feature in labaratory. On non-contrast CT, there was a benign cystic lesion starting from the posterosuperior of the right iliac bone and extending to the level of the sacroiliac joint (Figure 3). We first performed embolization but it did not work, so we decided on foam sclerotherapy.

Materials and Methods: We used this technique to distribute the sclerosing agent to a large part of the cyst and prevent possible vascular reflux. We applied deep sedation on the CT table with anesthesia support. We sent two 1.2 mm trocar bone biopsy needles as far apart as possible. Later, when we confirmed that we were in the right place, we aspirated some cyst fluid and than mixed 4 mg/kg dose of polidocanol with ¼ air and turned it into foam using the Tessari technique. We gave the mixture through the first needle and withdrew it from the second needle (Figure 4,5). Then we repeated this a few times and finished the process.

Discussion: In the literature, the success rates of sclerotherapy with polidocanol are reported to vary between 83% and 100%. Although sclerotherapy has various complications, studies comparing it with curettage have reported mild improvement and lower morbidity rates in favor of sclerotherapy (2,3). Success of the procedure is generally accepted as the disappearance of pain in addition to complete ossification on radiographs. There was clinical improvement in both of our cases, but we did not take the control image of the second case because we thought it was premature. There was a significant shrinkage of the lesion in the control CT image of case 1. In addition, as the pain disappeared, the limitation of movement decreased and there was a significant increase in thickness of the patient's muscle structures (Figure 6). Although there is no complete or nearly complete ossification, the follow-up process of both patients continues.

Conclusion: Percutaneous foam sclerotherapy with polidocanol using the modified Tessari technique appears to be a safe alternative for the treatment of aneurysmal bone cysts. However, case series and more studies are needed.

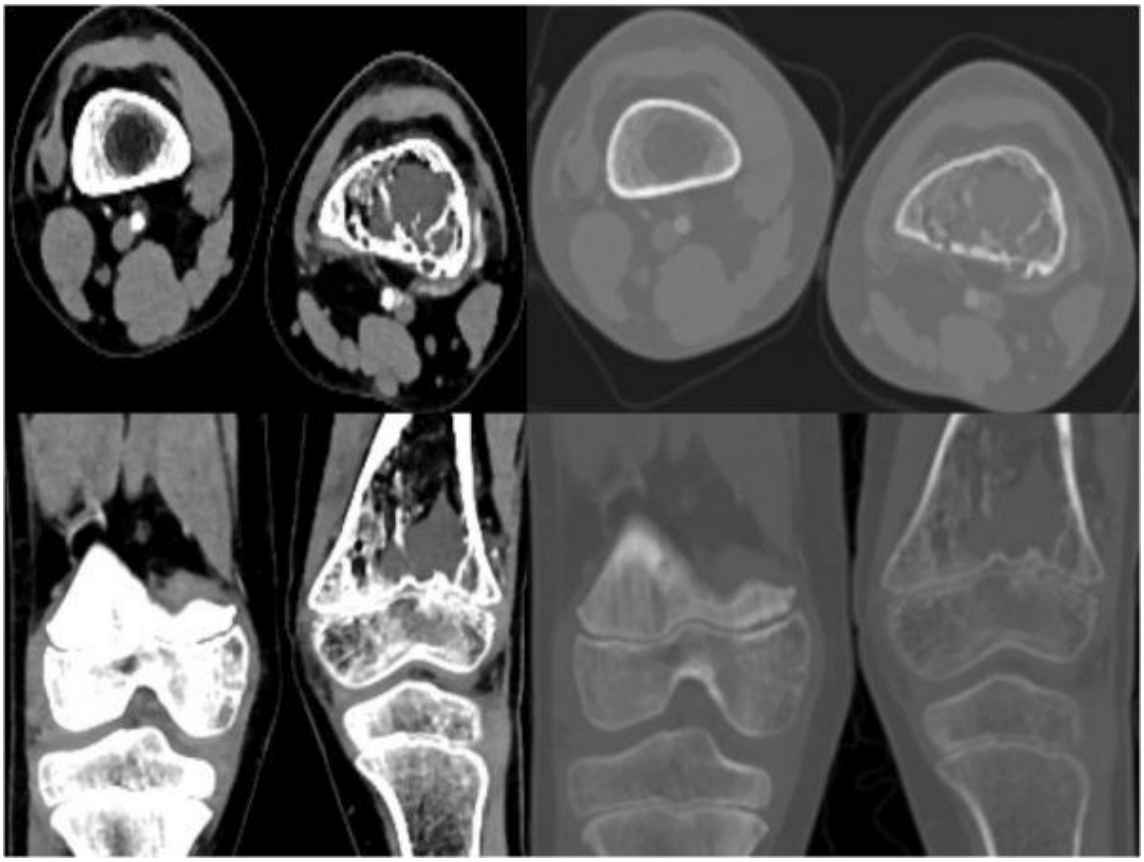
Keywords : Modified Tessari Technique, Aneurysmal Bone Cyst, Sclerotherapy, Polidocanol

References:

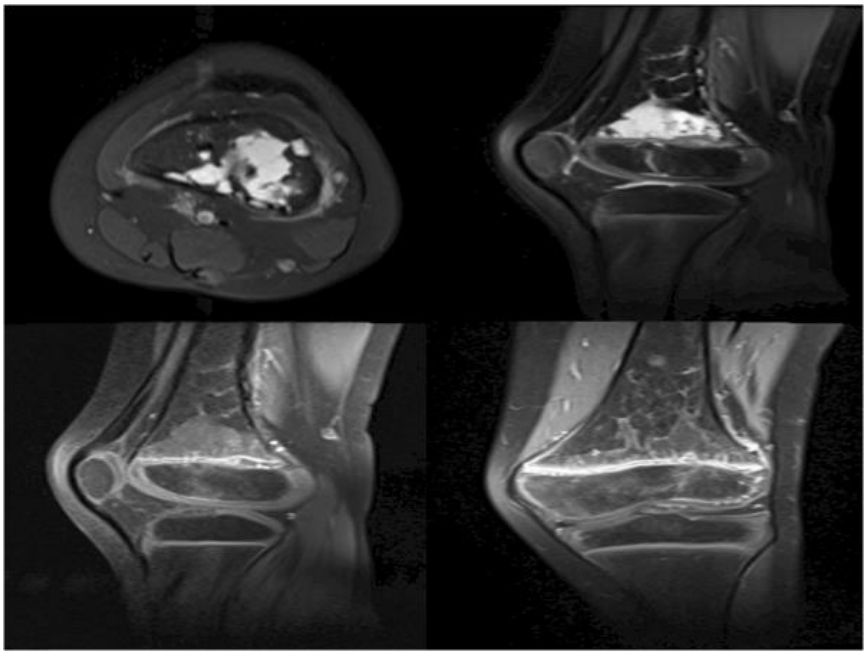
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Figure:

Description of the Figure: Figure 1: CT angiography of the lower extremity shows a benign cystic lesion containing bone septa, causing expansion of the cortex, and showing no significant contrast enhancement.



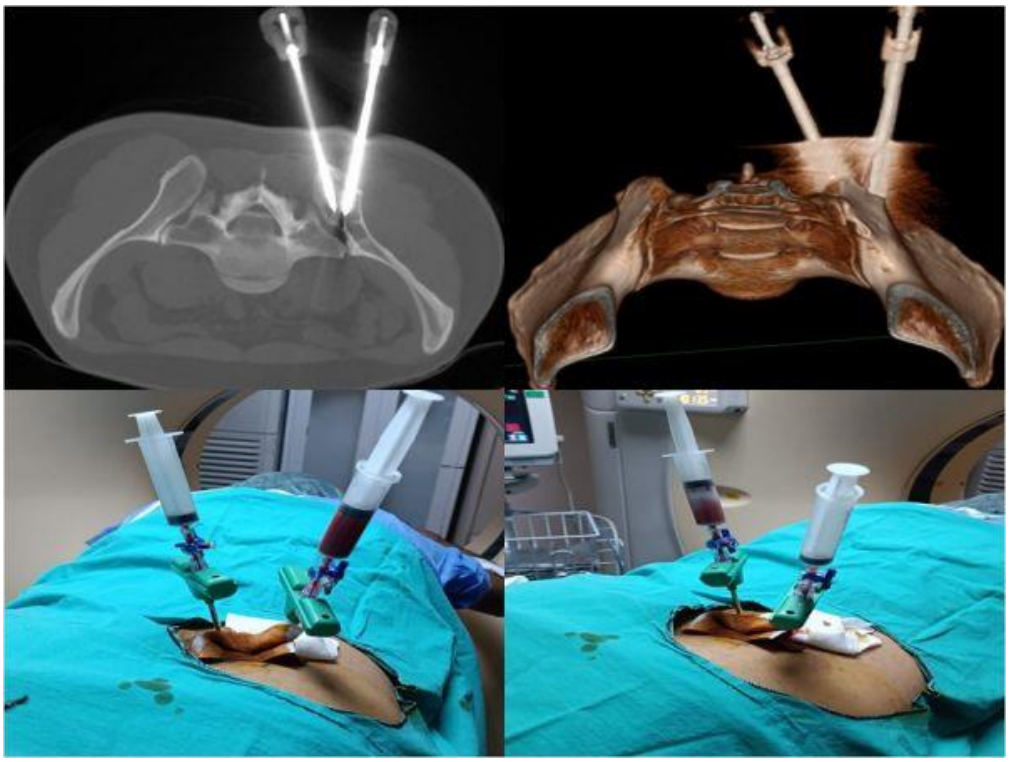
Description of the Figure: Figure 2: Contrast-enhanced left knee MRI: Cystic lesion located in the metaphysis, with thin peripheral contrast, thin septa, and lobulated contours.



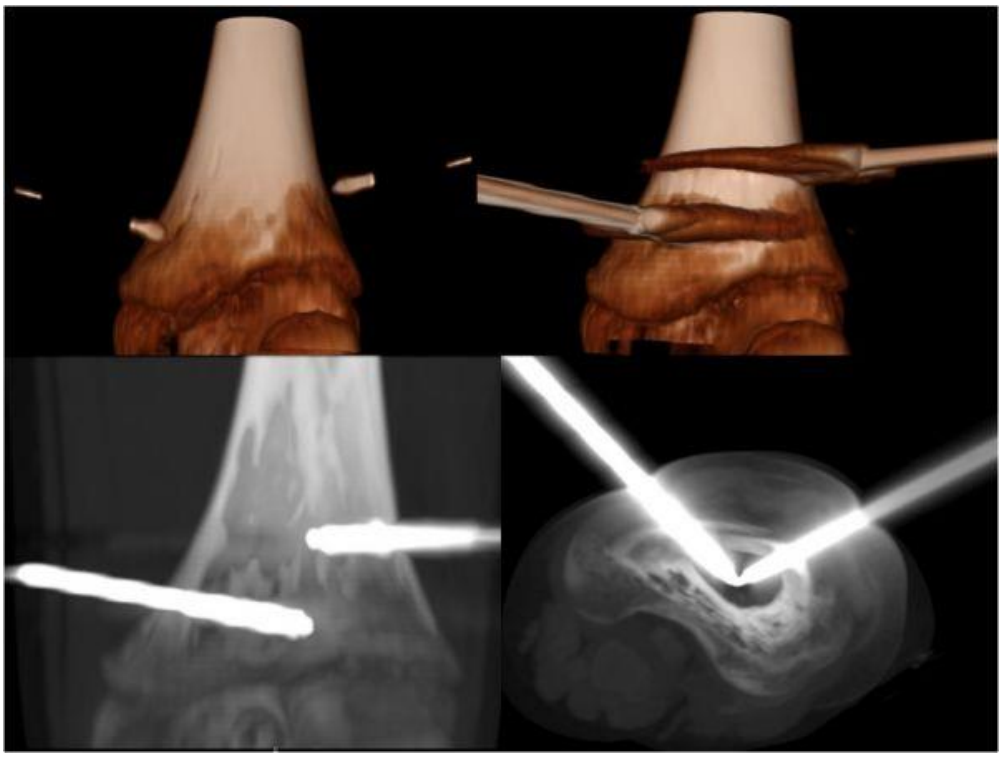
Description of the Figure: Figure 3: Benign cystic lesion in the right iliac bone with thin septation, slightly expanded and thinning cortex on non-contrast CT image.



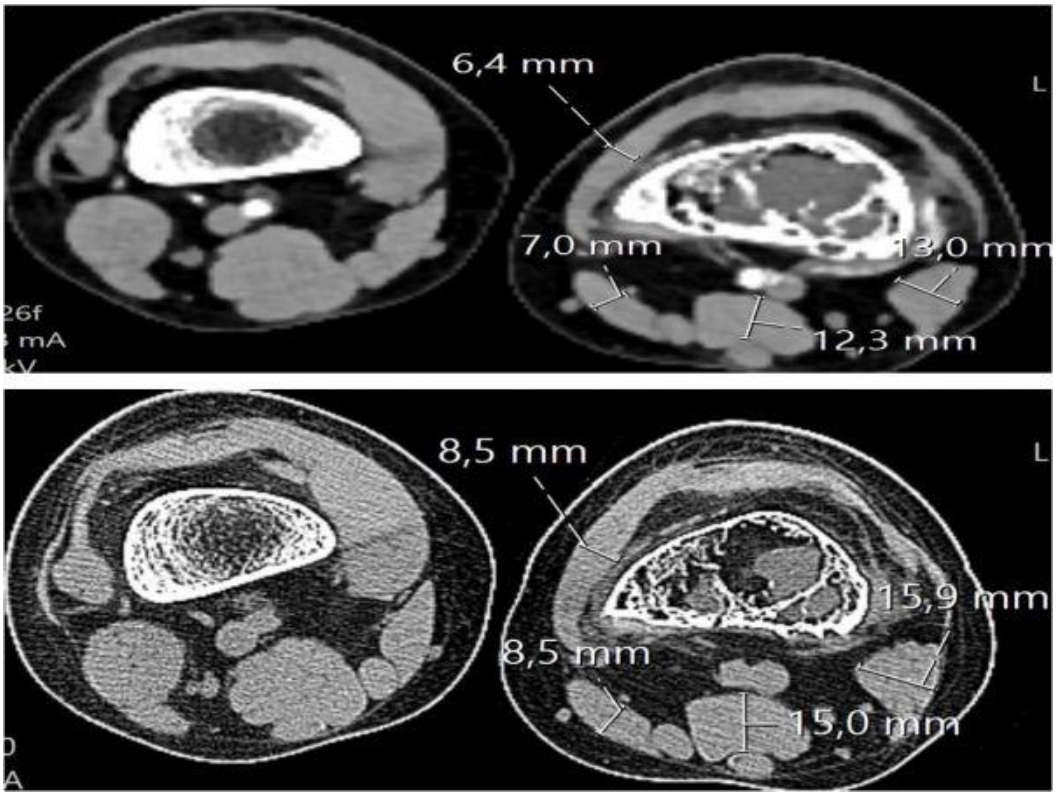
Description of the Figure: Figure 4: To apply the modified tessari technique, entry must be made from at least two places.



Description of the Figure: Figure 5: To apply the modified tessari technique, entry must be made from at least two places.



Description of the Figure: Figure 6: Comparison of before and after procedure



Vascular interventional Radiology
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PERCUTANEOUS TISSUE ABLATION WITH RADIOACTIVE LUTETIUM-177 HYDROGEL

Rahmi Oklu[1], Dila Atar[1], Hassan Albadawi[1], Zefu Zhang[1], Yusuf M Demirlenk[1], Enes Cevik[1], Suliman Rehman[1], Joseph L. Mayer[1]
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Aim: Half of all cancer patients undergo radiotherapy. Stereotactic Body Radiation Therapy (SBRT) is costly, increases morbidity, and can cause significant complications severely impacting quality of life. Radioimmunotherapy (RIT), Peptide Receptor Radionuclide Therapy (PRRT) or Lutetium-177–Prostate Specific Membrane Antigen (PSMA)-617 therapy are limited by poor biological half-life, hematological toxicity and off-target effects. In addressing the limitations of current systemic or locoregional radiotherapies for solid tumors, we designed a novel formulation of an injectable hydrogel named PEARL-177 (PErcutaneous Ablation with Radioactive Lutetium-177) that combines uniformly distributed Lu-177 radioactive isotopes as a percutaneous therapeutic modality for enabling targeted and precise tissue ablation.

Material and Method: A novel biomaterial (PEARL) incorporating Lu-177 and nano-silicate based hydrogel was formulated to yield a homogenous injectable radioactive ablation agent with an optimized dosimetry. Rigorous mechanical testing was performed, and *in vitro* cell viability was evaluated using a human cancer cell lines. Subsequently, *in vivo* analyses were performed using both rat and rabbit animal models to evaluate the focal ablation effect of PEARL.

Findings: PEARL-177 has unique properties including ease of delivery under image guidance, the capability to achieve tissue ablation with confidence, and most importantly, the ability to deliver radioactivity to the parenchymal tissue that remains long-term within the ablation zone by delivering Lu-177 particles internally. In rabbit survival experiments, PEARL-177 showed complete tissue ablation without systemic toxicity and homogenous distribution of the isotopes within the tissue.

Conclusion: PEARL-177 is a new class of radioactive biomaterials for potential CT or US image-guided ablation of solid tumors. This innovative hydrogel holds significant potential for improving the treatment of solid tumors and could be a promising alternative to the current therapy options.

Non-Vascular interventional Radiology
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EFFECTIVENESS OF TRANSFORAMINAL EPIDURAL STEROID INJECTION ON PAIN LEVELS IN PATIENTS DIAGNOSED WITH LUMBAR DISC HERNIATION

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[0]Istanbul Basaksehir Cam Ve Sakura City Hos

OBJECTIVE: Low back pain is described as a movement-restricting pain lasting at least one day, either with or without accompanying pain in one or more lower extremities.(1) Low back pain is primarily musculoskeletal in origin, with lumbar disc herniations being the most common cause.(2) Furthermore, leg pain can also accompany lumbar disc herniations, significantly affecting an individual's quality of life.(3) Most patients with low back pain complaints can benefit from conservative methods.(4) In addition, in patients who do not respond to conservative treatment and do not have an absolute surgical indication, transforaminal epidural steroid injection (TFESI), one of the minimal invasive methods, is used for pain control in disc hernias.(5) TFESI plays a significant role in reducing nerve root inflammation and back pain caused by compression, allowing for the performance of daily life activities.(6) The aim of this study is to retrospectively evaluate the pain levels and effectiveness of TFESI in patients undergoing the procedure.

METHODS: In our single-center retrospective study, 39 patients who underwent transforaminal epidural steroid injections between January 2023 and November 2023 were included. Demographic data such as age, gender, height, weight, and chronic diseases of the patients were recorded. The use of painkillers before and after the procedure and post-procedure physiotherapy and rehabilitation statuses were determined. The patients were evaluated using the Visual Analog Scale (VAS) for pain severity before and one month after the treatment. Additionally, the Oswestry Disability Index (ODI) was used to evaluate the patients functionally before and after the treatment

RESULTS: Out of the 39 patients included in this study, 46.15% were female (n=18) and 53.84% were male (n=21). The average age of the patients was 51.13±12.88 years. The average VAS score before the procedure was 9.08±1.30, while it was 3.82±3.42 one month after the procedure. A statistically significant decrease was observed in VAS scores before and one month after the procedure ($p < 0.001$). The average ODI score before the procedure was 62.56±18.99, and it was 24.05±13.23 one month after the procedure. A statistically significant decrease was observed in ODI scores before and one month after the procedure ($p < 0.001$). No significant relationship was found between the Body Mass Index (BMI) and the effectiveness of the transforaminal epidural steroid injection ($p=0.372$). While all patients (n=39) used three or more nonsteroidal anti-inflammatory drugs (NSAII) before the procedure, this number decreased to 23.07% (n=9) after the procedure. This decrease was statistically significant ($p < 0.001$).

CONCLUSION: Transforaminal epidural steroid injection has been shown to reduce low back pain in patients diagnosed with lumbar disc herniation. As a result, it was determined that the use of medications related to back pain also decreased.

Keywords : KEYWORDS: Lumbar, Disc herniation , Epidural injection , Steroid , Low back pain

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Figure:

Description of the Figure: Comparison of demographic characteristics of patients who underwent TFESI according to VAS and ODI levels

	N= 39
Age: Mean±SD	51.13±12.88
Sex: Female/Male	18/21 (%46.15)/%53.84)
BMI: Mean±SD	27.30±3.73
Pre-procedure VAS Score: Mean±SD	9.08±1.30
Post-procedure 1-Month VAS Score: Mean±SD	3.82±3,42
Pre-procedure ODI Score: Mean±SD	62.56±18.99
Post-procedure 1-Month ODI Score: Mean±SD	24.05±13.23

Non-Vascular interventional Radiology
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THE DIAGNOSTIC PERFORMANCE OF IN-BORE MRI-GUIDED PROSTATE BIOPSIES IN HIGH LIKELIHOOD TARGETS: RESULTS FROM A SINGLE-CENTER STUDY

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[2]Department Of Urology, Vkf American Hospital
[3]Department Of Radiology, Vkf American Hospital
[4]Department Of Urology, Koc University Hospital

Purpose: This study aims to: 1) Evaluate the accuracy and effectiveness of multiparametric prostate MRI (mpMRI) and in-bore MRI-guided biopsy (IB-MRGB) for detecting clinically significant prostate cancer (csPCa) and the index PCa lesion; 2) Assess the reliability of the Gleason Score (GS) obtained through IB-MRGB biopsy by comparing it with the pathology results of radical prostatectomy (RP) in 110 patients.

Materials and Methods: Pathological records of 379 patients who underwent IB-MRGB for high-risk lesions (PI-RADS 4 or 5) identified on mpMRI between 2012 and 2023 were retrospectively reviewed. Investigations focused on overall PCa and csPCa detection rates, the average number of biopsy cores for each lesion, core positivity percentage in positive targets, and the average tumor length/core length (tl/cl) ratio in biopsy cores. CsPCa was defined as GS>(3+3). In 110 patients who underwent radical prostatectomy (RP) as a definitive therapy, the GS obtained by IB-MRGB was compared with the final pathology GS to determine the upgrading and downgrading rates. The ability of mpMRI and subsequent IB-MRGB to detect index PCa lesions was also evaluated using whole-mount step-section RP specimens as a gold standard. The index lesion was identified as the one with the highest Gleason Score (GS) in the final pathology.

Results: Our study cohort included 379 patients with 425 high-risk targets (PIRADS 4(n=271), PI-RADS 5(n=154)). The mean age was 66 years, the mean PSA level was 7 ng/mL, and the mean lesion size was 11.75 mm. The zonal distribution of the lesions was as follows: 351/425 in the peripheral zone, 67/425 in the transitional zone, and 7/425 in the central zone. The average number of cores taken per lesion was 3.3, yielding a 70.7% core positivity rate in positive targets. The mean tl/cl ratio in positive biopsy cores was 52%. The overall and clinically significant PCa detection rates were found to be 79.2% (300/379) and 59.6% (226/379) in a per-patient-based analysis, 77% (328/425) and 57.4% (244/425) in a per lesion-based analysis. The detection rates for overall and clinically significant PCa were significantly greater in PI-RADS 5 lesions than in PI-RADS 4 lesions ($p<0.01$).

Of the 110 patients who underwent RP, the GS obtained from IB-MRGB was concordant with the final pathology in 69 patients (62.7%). Upgrading and downgrading in biopsy GS were observed in 30 patients (27.3%) and 11 patients (10%) respectively on the final pathology. No downgrading to GS (3+3) was observed. In 109 out of 110 patients, the index PCa focus was successfully detected by mpMRI and sampled using IB-MRGB.

Conclusion: According to our findings, the MRI pathway consisting of mpMRI followed by IB-MRGB is effective and accurate for detecting csPCa and the index PCa lesion in PI-RADS 4 and 5 targets.

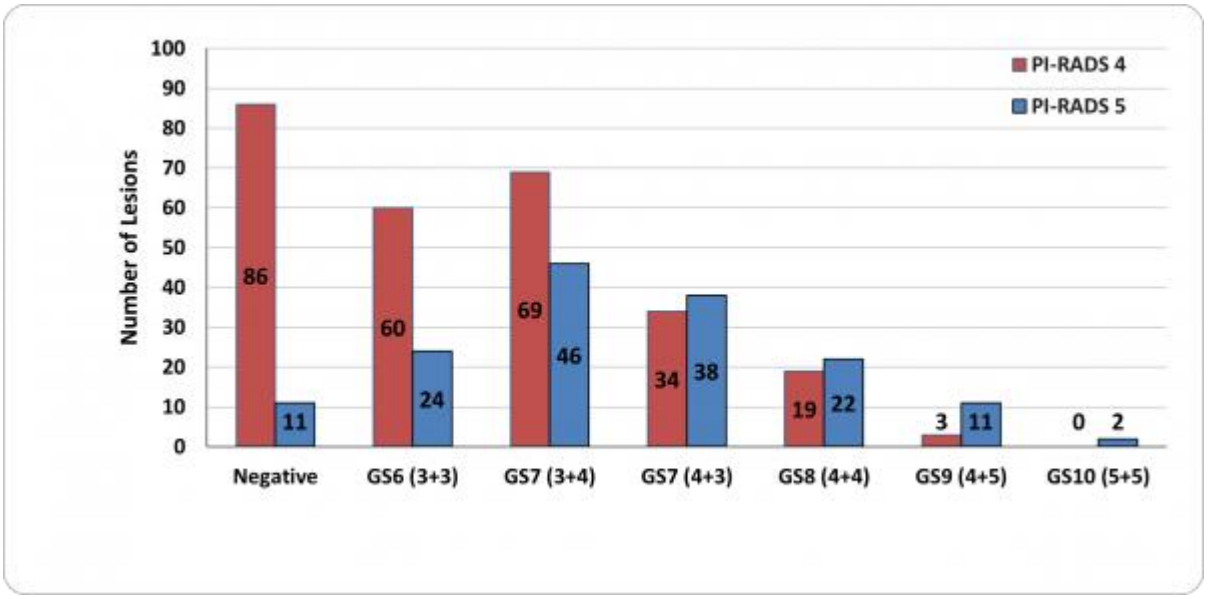
Keywords : Prostate Cancer, Magnetic resonance İmaging, In-bore MRI-guided biopsy

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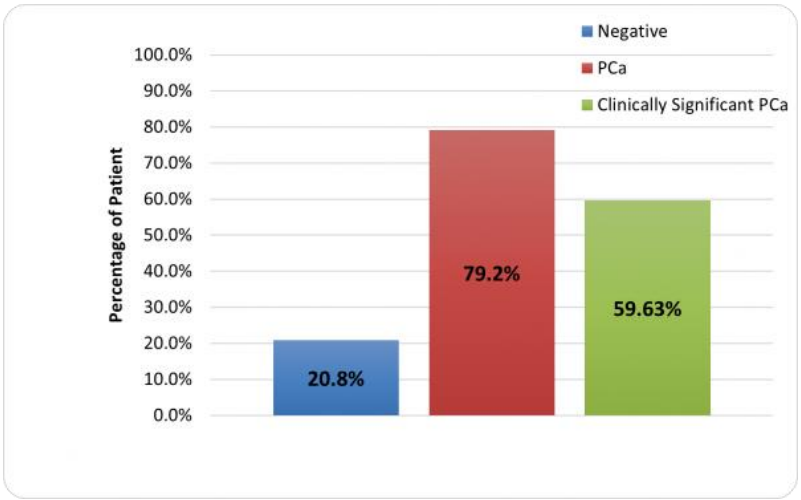
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Figure:

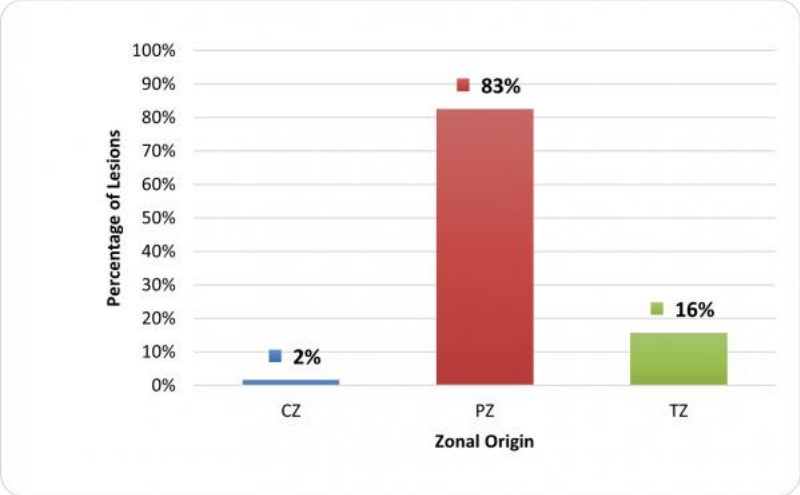
Description of the Figure: The bar chart displays the detailed distribution of biopsy results for PI-RADS 4 and PI-RADS 5 targets.



Description of the Figure: Percentage Distribution of Biopsy Outcomes in a per patient analysis.



Description of the Figure: The zonal distribution of the lesions



Tables:

Properties of Biopsy Cores

Average number of biopsy cores	3.3
Average cancer involvement in positive biopsy cores	52%
Core positivity rate in positive targets	70.7%

Non-Vascular interventional Radiology
SB-35

ENDOBILIARY RADIOFREQUENCY ABLATION IN THE TREATMENT OF BENIGN BILIARY STRICTURES

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Objective: In our study, we aimed to evaluate the safety and efficiency of endobiliary radiofrequency ablation (RFA) in the treatment of benign anastomotic strictures (duct to enteric and duct to duct) which were resistant to the standard percutaneous treatments.

Materials and Methods: A total of 22 patients who were resistant to the standard percutaneous treatments, interventional therapies were performed as 14 (63.64%) had right side, 1 (4.55%) left side, and 7 (31.82%) bilaterally. Endobiliary RFA procedure was performed separately on both sides of the patients who had bilateral interventions. Tissue sampling with forceps under percutaneous cholangioscopy, fluoroscopy, percutaneous stone breaking and removal were performed before endobiliary RFA procedure in 12 patients. Technique and clinical success, recurrence, procedural morbidity and mortality rates after RFA were examined.

Results: Catheter removal was achieved in all of the patients. Our technical success rate was 100%, and our primary clinical success rate was 95.4%. Significant decreases in serum markers were observed after the procedure. Our average symptom-free time after endobiliary RFA and catheter removal was on average 587 days (210-1170 days). Endobiliary RFA was applied again to 4 patients (18.18%) whose symptoms recurred after the procedure. No major complications due to RFA were observed.

Conclusion: There is no current standard definitive treatment for benign biliary strictures. Recurrence rates of all modalities are still not at acceptable levels. Our endobiliary RFA results are promising in the selected patients' group who were treated with percutaneous intervention but could not get rid of catheterization, which seriously disturbs patient's comfort despite a benign cause.

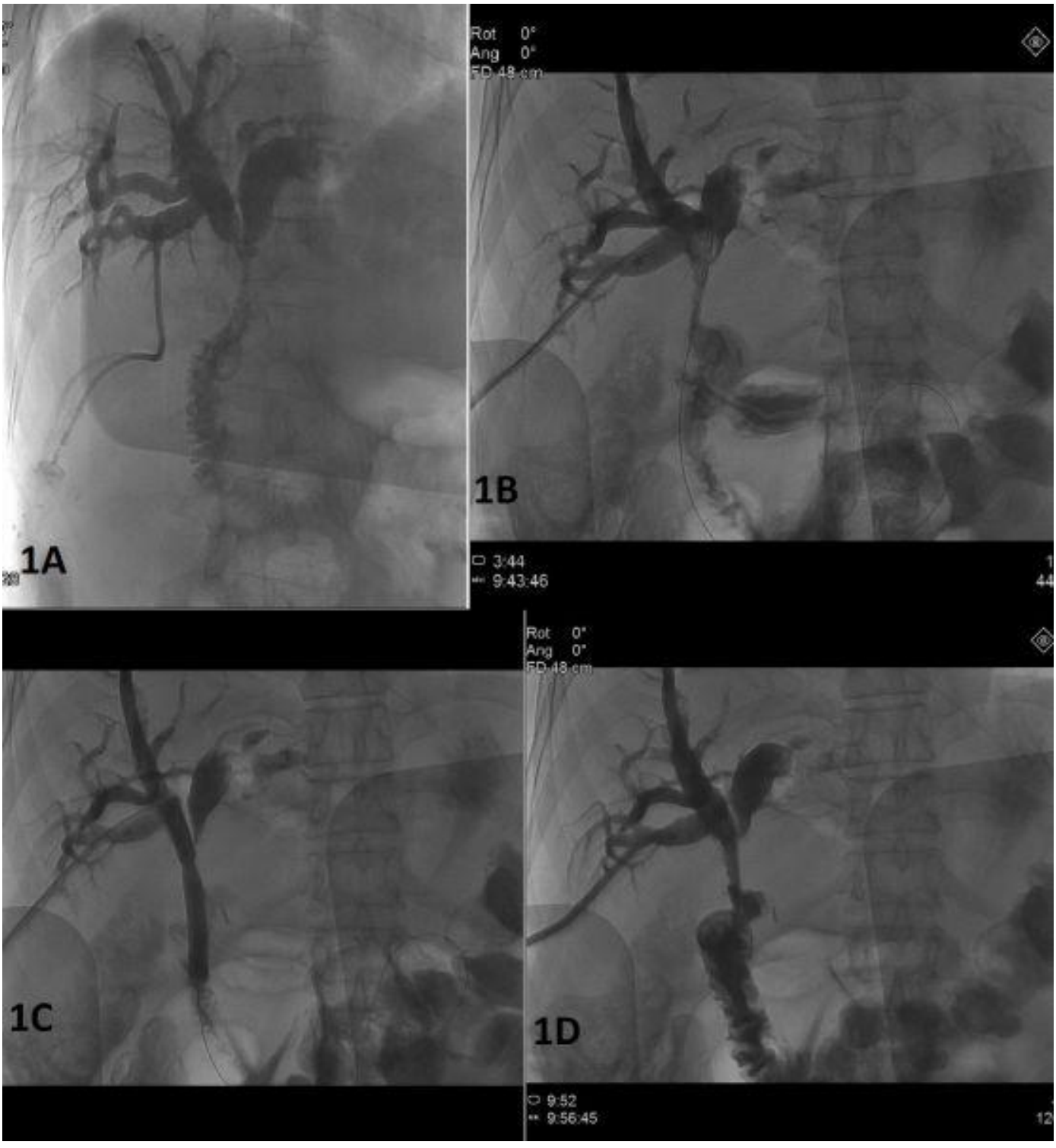
Keywords : Biliary strictures, Endobiliary, Radio frequency ablation, Percutaneous treatment, Interventional Radiology.

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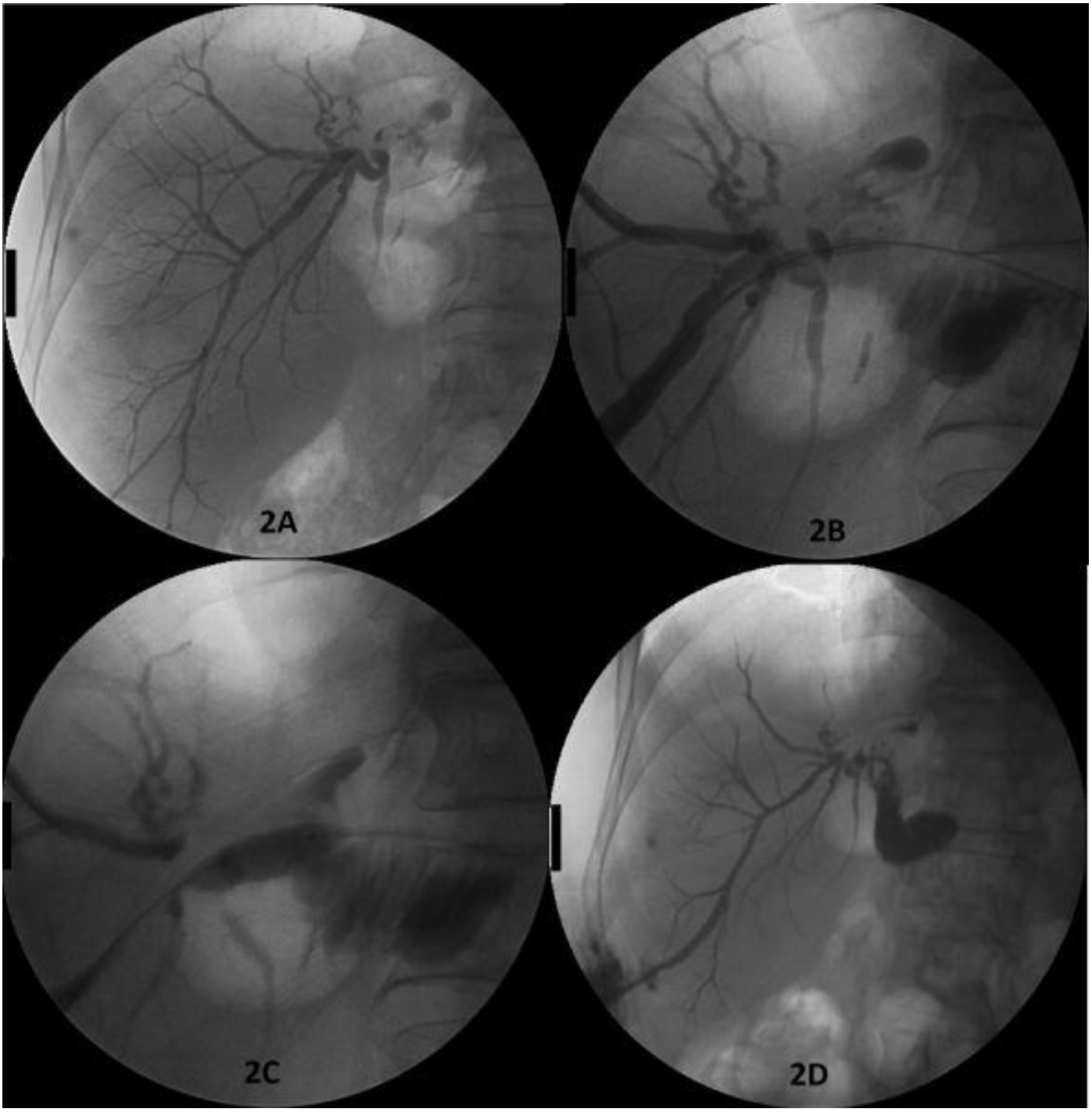
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Figure:

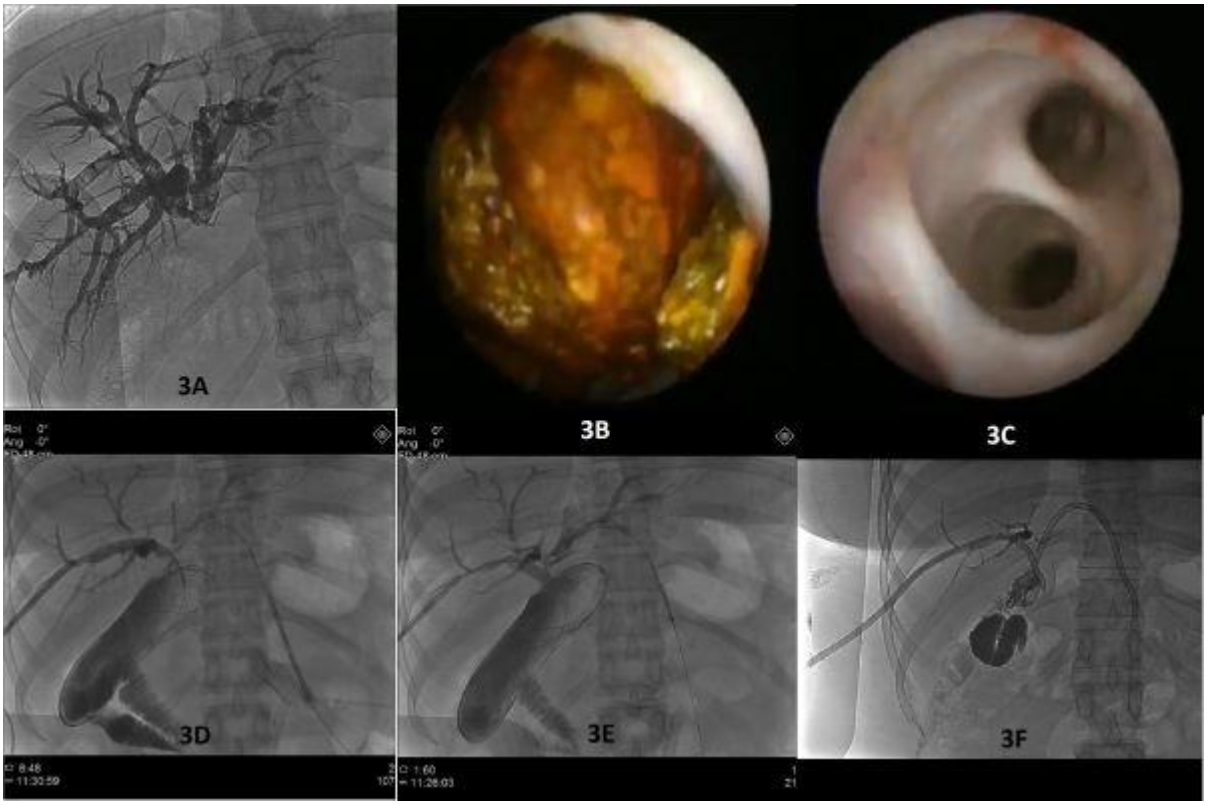
Description of the Figure: Figure 1. A: Standard percutaneous treatment approach in patient with bilioenteric anastomotic stricture, long-term catheterization. B: Endobiliary radiofrequency ablation application to the stricture area. C: Dilatation of the stricture area with balloon catheters immediately after endobiliary radiofrequency ablation. D: Large-diameter (10-14F) catheter placement after endobiliary radiofrequency ablation and balloon dilatation.



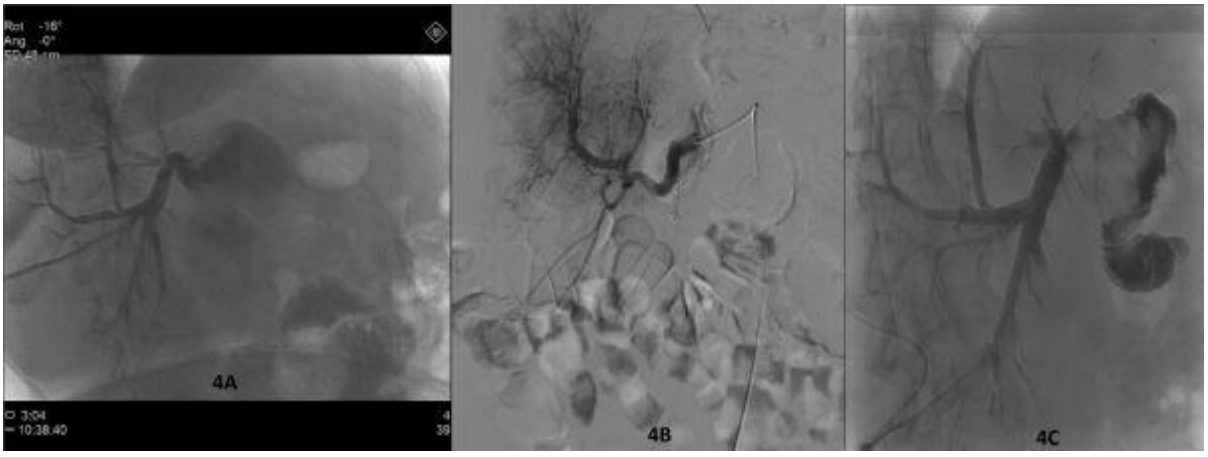
Description of the Figure: Figure 2. A: Stricture in the bilioenteric anastomosis of the transplant liver in percutaneous transhepatic cholangiography. B: Application of endobiliary radiofrequency ablation to the stricture area. C: Dilatation of the stricture area with balloon catheters immediately after endobiliary radiofrequency ablation. D: Large-diameter (10-14F) catheter placement after endobiliary radiofrequency ablation and balloon dilatation.



Description of the Figure: Figure 3. A: Percutaneous transhepatic cholangiography shows stricture and multiple stones in the intrahepatic bile ducts in the patient who developed bilioenteric anastomosis stricture after common bile duct injury during gallbladder surgery. B: Stones in the bile ducts are observed by cholangioscopy performed percutaneously. C: Imaging of the bile ducts with cholangioroscopy after biliary stones are broken with pneumatic and laser and removed percutaneously. D: Endobiliary radiofrequency ablation application to the stricture area. E: Dilatation of the stricture area with balloon catheters immediately after endobiliary radiofrequency ablation. F: Placement of large diameter (10-14F) biliary drainage catheters with entry from both lobes after endobiliary radiofrequency ablation and balloon dilatation.



Description of the Figure: Figure 4. A: Placement of a biliary drainage catheter after endobiliary radiofrequency ablation to a patient who underwent biliary-enteric anastomosis due to Klatskin tumour. B: Endovascular treatment with bleeding from the mass in the jejunum and coil embolization in the anastomosis neighborhood 3 months after endobiliary radiofrequency ablation. C: Filling defect of polypoid tumoral mass filling the jejunal loop in percutaneous transhepatic cholangiography (arrow).



Non-Vascular interventional Radiology
SB-36

MICROWAVE ABLATION: AN EFFECTIVE AND SAFE ALTERNATIVE TO SURGICAL RESECTION FOR GIANT HEPATIC HEMANGIOMAS – A COMPREHENSIVE LITERATURE REVIEW AND ANALYSIS OF

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[1]Sultan 2. Abdülhamid Han Educational And Research Hospital

Giant hepatic hemangiomas, typically considered benign, pose a significant risk of morbidity and mortality if left untreated. Traditional surgical resection, while a common approach, presents challenges due to tumor size, location, and potential postoperative complications. Microwave ablation (MWA) has emerged as a promising alternative for giant hepatic hemangioma treatment, emphasizing its efficacy and safety. Utilizing electromagnetic radiation to heat and destroy tumorous tissue, MWA offers advantages such as reduced invasiveness, shorter procedure time, lower morbidity rates, shorter hospital stays, and lower costs compared to surgery.

In this literature review, we systematically searched databases, identifying 10 relevant studies meeting inclusion criteria, encompassing 296 patients. Success rates for complete hemangioma ablation with MWA ranged from 70% to 100%. Patients treated with MWA had tumor sizes ranging from 5.6 cm to 13.5 cm, demonstrating an average post-treatment reduction of approximately 80% in size, with no contrast enhancement on computed tomography scans. Primary complications, including mild post-procedural fever and pain, were generally temporary, while rare complications were manageable without significant morbidity or mortality, encompassing hepatic fluid collections, liver abscesses, and intrahepatic hemorrhage.

This review underscores MWA as an effective and safe alternative to surgical resection for giant hepatic hemangiomas. We advocate for clinicians to consider MWA, particularly in cases where surgery is not feasible or carries substantial risks. While the findings support the numerous advantages of MWA, further studies are warranted to validate its potential in the comprehensive treatment of giant hepatic hemangiomas

Conclusion: In conclusion, our comprehensive review highlights microwave ablation (MWA) as a highly effective and safe alternative to surgical resection for the treatment of giant hepatic hemangiomas. MWA demonstrates notable advantages, including reduced invasiveness, shorter procedural time, and lower morbidity rates. Additionally, the associated benefits of shorter hospital stays and lower costs further underscore its clinical appeal compared to traditional surgery. Our findings suggest that MWA has the potential to become the standard of care for giant hepatic hemangiomas, offering a compelling option for clinicians, particularly in cases where surgery is not feasible or carries significant risks. We strongly recommend that clinicians consider MWA as a primary treatment modality for patients with giant hepatic hemangiomas. However, to solidify its role in clinical practice, further studies are imperative to confirm and establish the full potential of MWA in the treatment landscape of giant hepatic hemangiomas.

Keywords : giant hepatic hemangioma, microwave ablation, efficacy, safety, treatment, alternative

References :

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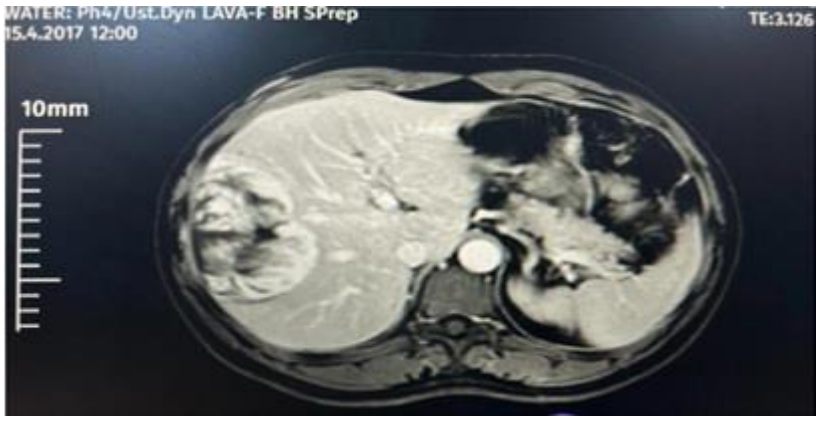
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Figure :

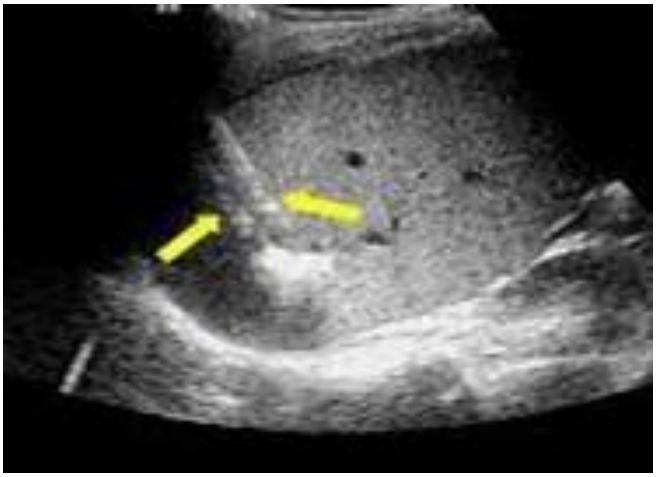
Description of the Figure: Ultrasonographic appearence of liver right lobe hemangioma



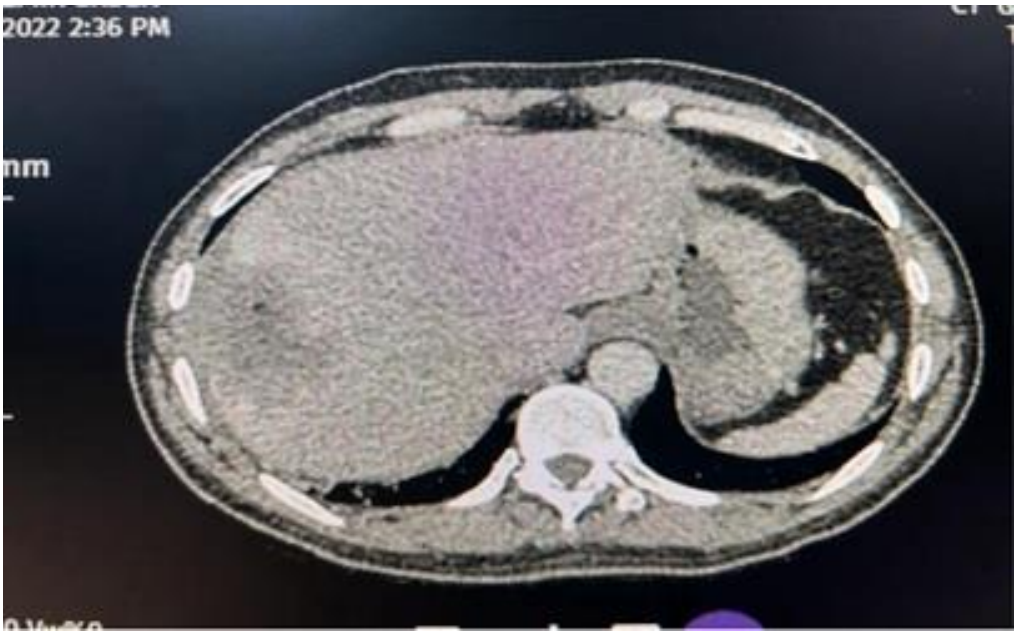
Description of the Figure: Contrast enhanced CT shows peripheral noduler enhancement pattern conistent with hemangioma.



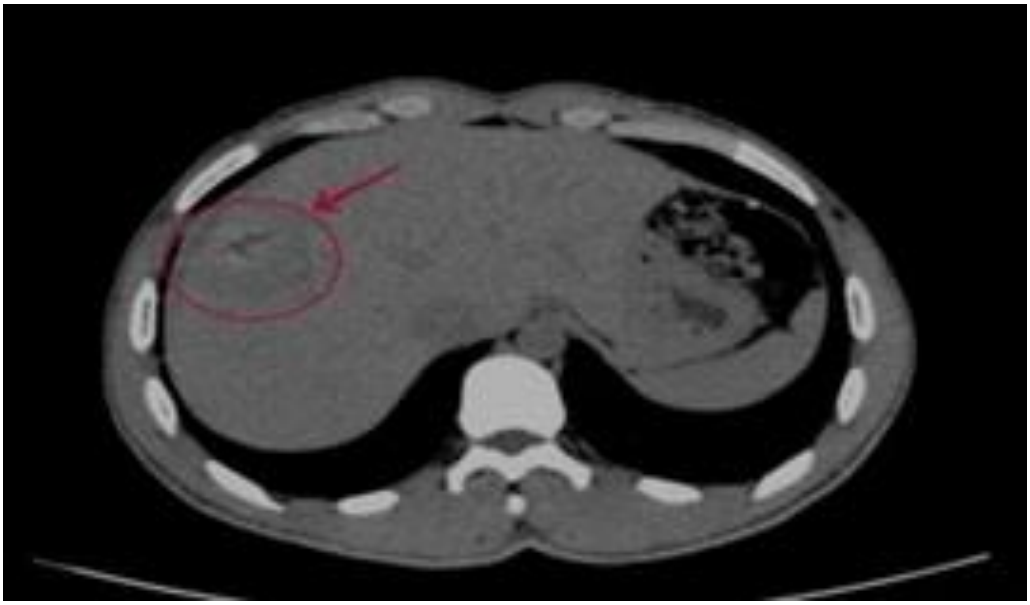
Description of the Figure: MW ablation of hemangioma with mooving shot technique to cover all area which is larger than static ablation zone size of mass



Description of the Figure: One week after ablation control Ct shows no enhancement consistent with total ablation and small punctat air buble inside hemangioma is a remnant related with termal ablation.



Description of the Figure: year follow up CT image depicts near total shrink of hemangioma.



Non-Vascular interventional Radiology
SB-37

ULTRASOUND AND FLUOROSCOPY-ASSISTED PERITONEAL DIALYSIS CATHETER PLACEMENT; POST-PROCEDURAL OUTCOMES

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Purpose: Peritoneal dialysis (PD) catheters may be inserted surgically, blindly or by fluoroscopic approach. Adding ultrasound assistance to the fluoroscopic technique ensures entry into the abdominal cavity under direct ultrasound visualization. In this way, complications such as intestinal perforation due to puncture or damage to the superficial epigastric vessels can be significantly prevented. The aim of our study is to share our case series in which we reveal our peritoneal dialysis catheter placement technique and catheter-related complications in the post-procedure period.

Materials and methods: In this single-center study, from May 2021 to August 2023 ultrasound-fluoroscopic guided placement of PD catheters was attempted in 33 end-stage renal disease (ESRD) patients. Preoperative evaluation was performed on all patients prior to the procedure and patients were reviewed retrospectively. Short-term outcomes and complications related to treatment termination were followed.

Results: A total of 33 adult patients (19 women, 14 men; mean age 60.3) were reviewed. No complications were observed during the procedure in any patient. Two patients were started on acute peritoneal dialysis on the same day of catheter placement without any complications. The rest of the patients started peritoneal dialysis within two months of catheter placement. In terms of short-term outcomes, catheter herniation into inguinal hernia was observed in one patient (3%), hemodialysis fluid leakage to the pelvic area in two patients (6%), and catheter malfunction in one patient (3%). While the patient with herniation could continue his treatment in the next period, treatment was terminated in patients with catheter malfunction and hemodialysis fluid leakage. Apart from these, one patient whose catheter function was not impaired died due to malignancy.

Conclusion: The ultrasound assistance to fluoroscopic technique seems to be safe and effective. The short-term complication rates are encouraging; however, these results need to be validated in long-term follow-up studies.

Keywords : Dialysis, peritoneal catheter, imaging guidance

Non-Vascular interventional Radiology
SB-38

COMPARING THE EFFECT OF IMMEDIATE PATIENT ROLLOVER WITH THE MODIFIED AUTOLOGOUS BLOOD PATCH TECHNIQUE ON THE DEVELOPMENT OF COMPLICATIONS IN CT-GUIDED LUNG BIOPSIES

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[1]Bakırcay Unıversıty Cıglı Regıonal Educatıon Hospıtal

The rise in cancer cases and the need for detailed analyses have increased the use of percutaneous lung biopsies. CT-guided biopsies, known for examining lung nodules, are successful (nearly 100%) and accurate (up to 98%).(1,2)

Pneumothorax is a common complication of lung biopsies, influenced by patient and procedural factors.(3) Up to 15% of these cases may require chest tube placement and a longer hospital stay. (3,4) Pneumothorax usually happens when air leaks from the lung at the needle entry site. Various techniques are being used to reduce this risk, mainly by sealing the lung tissue as the needle is withdrawn.(5-7)

Material & Method: This retrospective study, conducted at Çiğli Regional Hospital, included 74 patients who had lung biopsies between Jan 1, 2022, and Nov 30, 2023. The participants were split into two groups: 39 patients who received an autologous blood patch during their biopsy and 34 who didn't, with only immediate patient rollover applied.

Modified autologous blood patch technique: Pneumothorax often occurs from air leaking through the needle hole after lung biopsies, but it can also happen during the biopsy. To avoid this leakage, after the coaxial needle is positioned in the lesion, the trocar-tipped stylet is partially withdrawn. Autologous blood is then dripped between the stylet and cannula and after complete withdrawal, filled the cannula's lumen. This method stops air from entering the cannula, particularly under negative pressure when the patient inhales. It is observed that under negative pressure, the autologous blood is drawn into the cannula. When this happens, more autologous blood is added to the cannula to maintain the barrier against air entry. Finally, 7-8cc of autologous blood is introduced into the coaxial cannula to seal the tract after the biopsy.

Statistical Analysis: The study's data was summarized using descriptive statistics. The Fisher's Exact test analyzed the relationship between blood patch use and categorical outcomes (pneumothorax, drainage need, hemorrhage). All analyses were done using Python V3.11.

Results: This study included 73 patients who had lung biopsies, divided into a blood patch group (39 patients) and a control group (34 patients). There were no major differences between the groups in terms of age, gender, lesion size, distance to pleura, or thoracic wall thickness. Pneumothorax occurred in 7.69% of the blood patch group and 29.41% of the control group, with a significant reduction in the blood patch group ($p = 0.029$). No patients in the blood patch group required drainage, versus 8.82% in the control group, though this wasn't significant ($p = 0.096$). Hemorrhage was observed in 0% of the blood patch group and 11.76% of the control group, a significant difference ($p = 0.043$).

The findings suggest that the use of a modified blood patch can significantly decrease the incidence of pneumothorax and hemorrhage, enhancing patient safety during and after lung biopsy procedures.

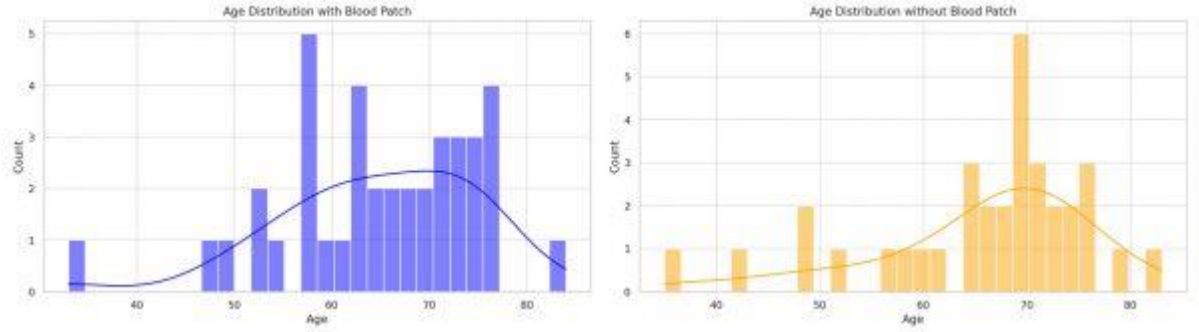
Keywords : lung biopsy, blood patch, pneumothorax

References:

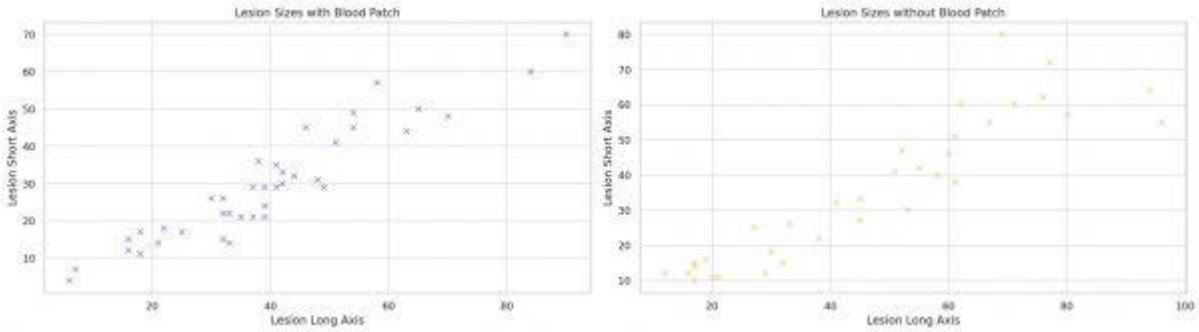
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Figure:

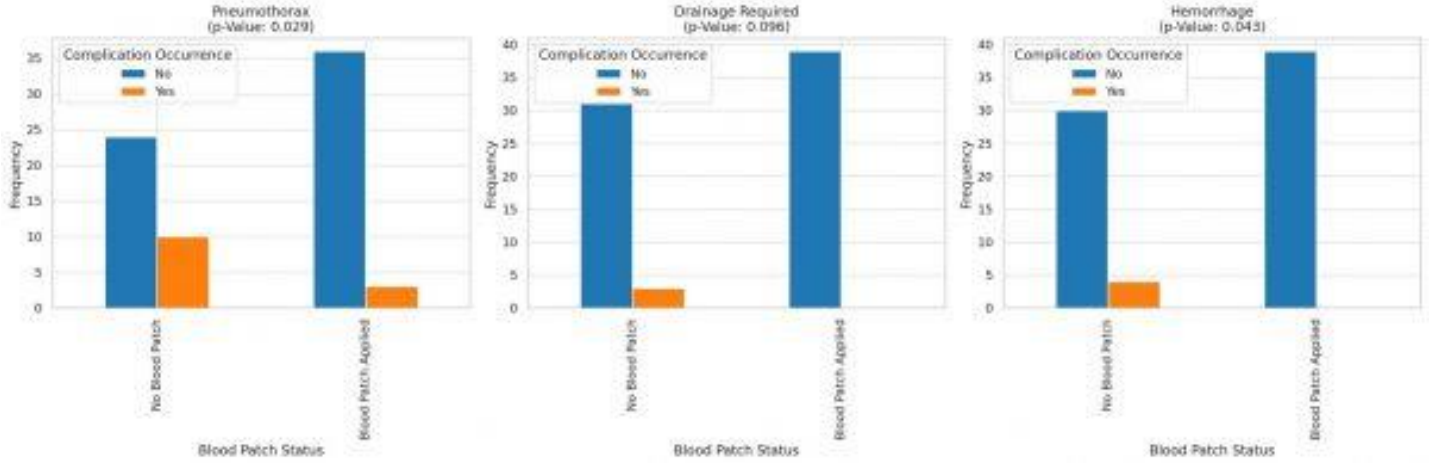
Description of the Figure: Age Distribution



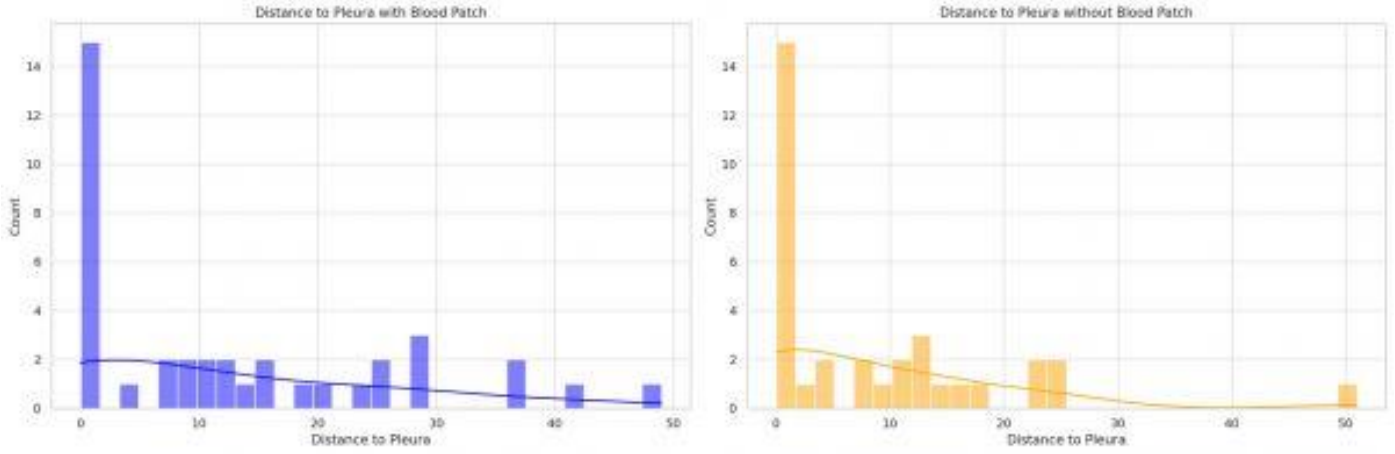
Description of the Figure: Lesion Sizes



Description of the Figure: Relationship between blood patch application and each complication



Description of the Figure: Distance to Pleura



Description of the Figure: Pathology Results



Tables:

Descriptive Statistics

Parameter	Blood Patch Applied Group	Blood Patch Not Applied Group
Patients	39	34
Age Mean	64.85	65.68
Age Std	10.14	10.52
Age Max	84	83
Age Min	33	35
Lesion Long Axis Mean	39.67	47.12
Lesion Long Axis Std	18.67	23.73
Lesion Short Axis Mean	29.46	35.62
Lesion Short Axis Std	15.32	20.47
Distance to Pleura Mean	12.54	8.56
Distance to Pleura Std	13.77	11.24
Thoracic Wall Thickness Mean	42.56	40.12
Thoracic Wall Thickness Std	11.93	12.85

Non-Vascular interventional Radiology
SB-39

THYROID CANCER MICROWAVE ABLATION FOR POST-THYROIDECTOMY LOCAL RECURRENCE

Rumeysa GÜNAY İNANÇ[1], Fatemeh AZİZİ[1], Zafer Ünsal COŞKUN[1]
[1]Sultan 2. Abdulhamid Han Research And Education Hospital

Objective: ablation for recurrence of well-differentiated thyroid carcinoma has not been rigorously reported, especially regarding ablation protocols, antibiotic prophylaxis, anatomic approach and sedation/recurrent laryngeal nerve monitoring. Herein we report our protocol and approach, rooted in existing surgical paradigms of the head and neck, for microwave of well-differentiated thyroid cancer within ATA (American Thyroid Association) guidelines performed by IR as part of a collaborative IR-Endocrine Surgery service line.

Methods: Retrospective study. Over a 5 years period from 2018-2023, patients with 8 FNA-proven local recurrences 2 cm or smaller were discussed in tumor board. Patients were treated with ultrasound- and CT-guided microwave ablation using various organ displacement and dermoprotective techniques. Follow-up imaging was obtained and patients were followed clinically in IR clinic. All microwave ablations and biopsies were performed by a single operator with 10 years of experience with microwave ablation. Procedural antibiotic prophylaxis was provided using a protocol of clindamycin and metronidazole to cover for oral flora, based on paradigms of head and neck surgery and tracheal proximity.

Results: Technical success was 100% (8/8) defined asbiochemical marker decrease and nomore cntrast enhanced lesion on CT. One MW ablation probe was used per lesion. Lesions were located adjacent to typically more than one of the following: trachea, carotid artery, jugular vein, subclavian artery, skin. All patients had stable or decreased nodule size at the 2 week imaging mark. Three patients with nodules less than 14x14 mm size had complete resolution of nodule at 3 months follow-up with no complications. Two patients with nodules near to trachea had transient hoarsness resolved after 6 weeks.One patient had recurrent laryngeal nerve palsy treated with vocal fold injection. All lesions showed 20 % decrease size of lesion and no Doppler vascular signal at 1 month follow-up ultrasound.

Conclusions: Microwave ablation can be safely applied adjacent to major vessels and the trachea in the neck with only light sedation and on an outpatient basis. The initial results are promising however complete shrinkage of the tumor may take longer than with thermal ablation which contracts the tissue. Commercially available probe selection, temperature goals and organ displacement/dermoprotective maneuvers factored into the success rate for these cases. Management of complications including stridor, recurrent laryngeal nerve palsy and Horner Syndrome was predictable by the position of the treatment target, and could be counseled during informed consent in IR clinic.

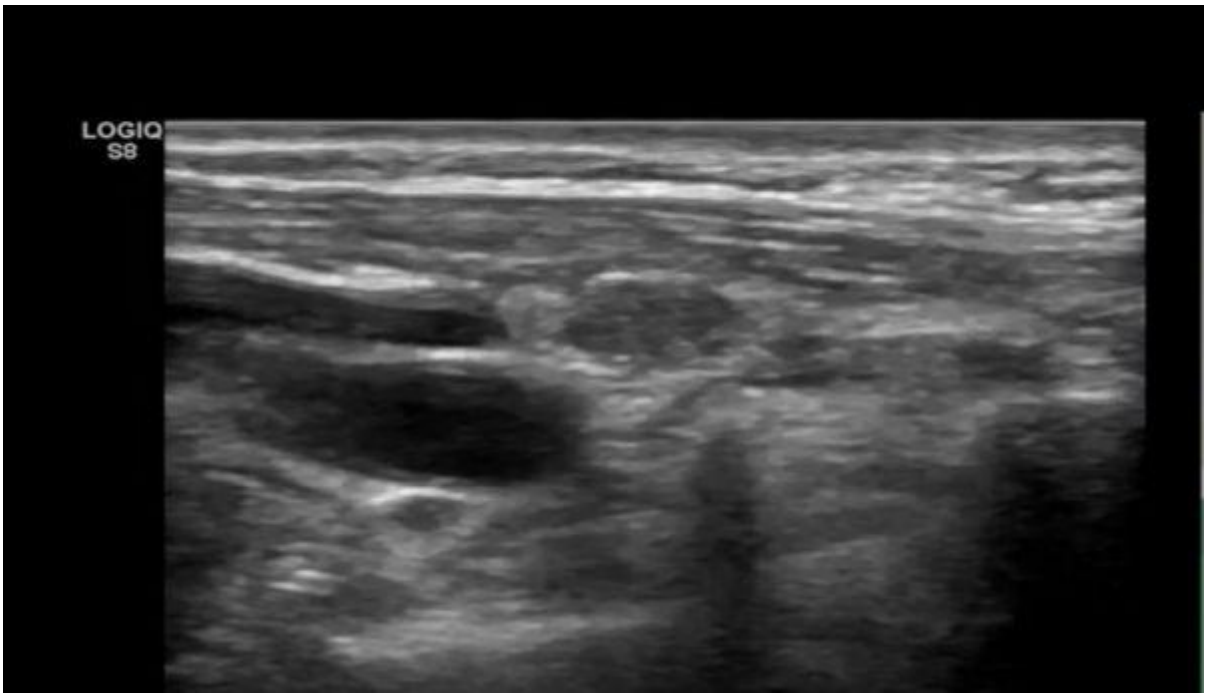
Keywords : Microwave ablation, thyroid cancer recurrence, outpatient procedure

References:

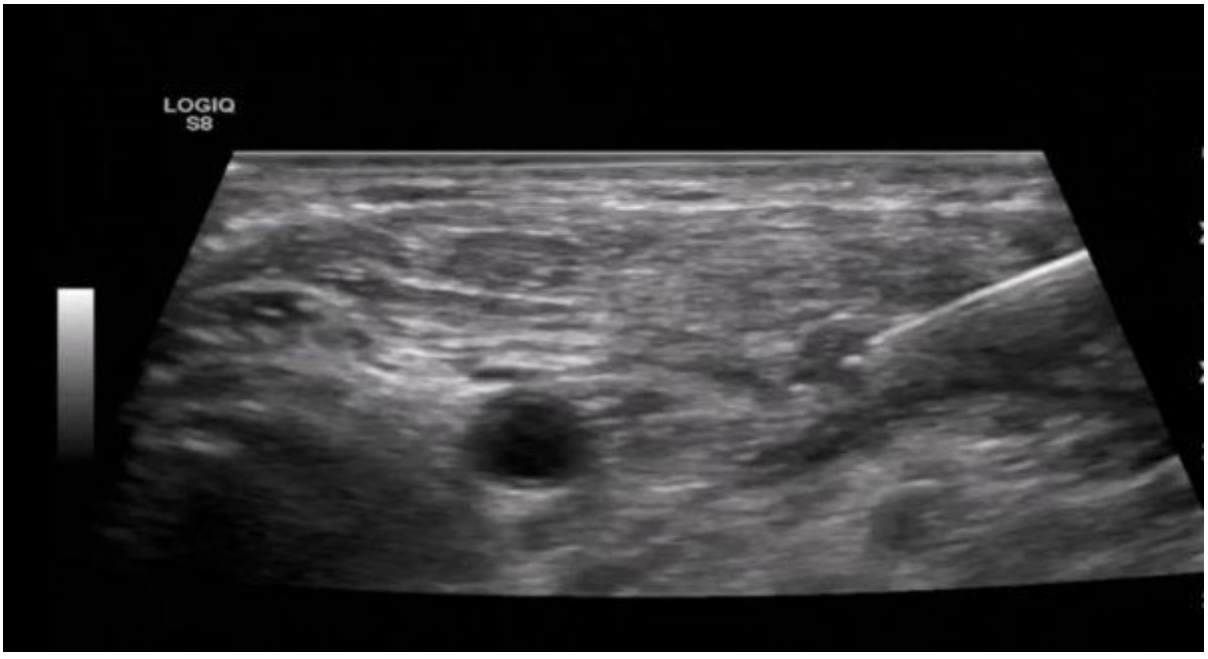
1.Microwave Ablation for Papillary Thyroid Microcarcinoma (Smith et al., 2023):Investigated the clinical effects of microwave ablation for low-risk papillary thyroid microcarcinoma.
2.Anatomy-Based Management of Recurrent Thyroid Cancer (Johnson et al., 2023):Explored radiofrequency ablation's efficacy in recurrent thyroid cancer, emphasizing an anatomy-based approach.
3.Percutaneous Ablation for Low-Risk Papillary Thyroid Cancer (Smith et al., 2023):Discussed the use of percutaneous ablation in treating low-risk papillary thyroid cancer.
4.Ablative Therapies for Thyroid Nodules (Anderson et al., 2023):Explored choices in ablative therapies for thyroid nodules.
5.Microwave Ablation Effectiveness (Johnson et al., 2023):Investigated the effectiveness of microwave ablation in treating thyroid microcarcinoma.
6.Radiofrequency Ablation for Locoregional Recurrences (Smith et al., 2015):Assessed the efficacy and safety of radiofrequency ablation in treating locoregional recurrences.
7.Radiofrequency and Ethanol Ablation for Recurrent Thyroid Cancer (Smith et al., 2023):Explored the current status and challenges of radiofrequency and ethanol ablation for recurrent thyroid cancer.
8.Ultrasound-Guided Ablation for Metastatic Thyroid Cancer (Kim et al., 2023):Studied locoregional control of metastatic well-differentiated thyroid cancer using ultrasound-guided radiofrequency ablation.

Figure:

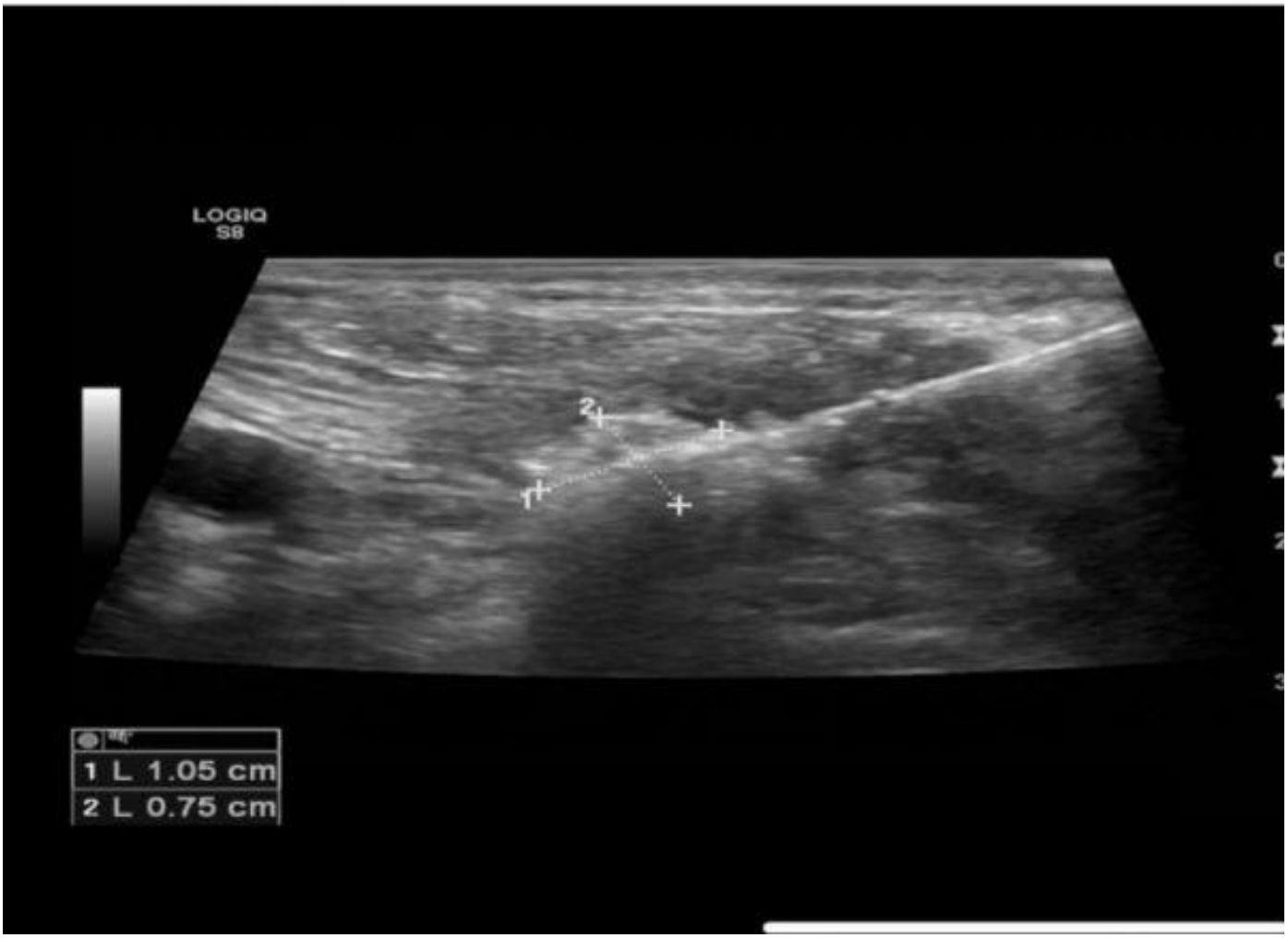
Description of the Figure: Biopsy proven thyroid papillary cancer ultrasound appearence depicted at thyroidectomy site.



Description of the Figure: MW probe insertion in to the recurrent tumor.



Description of the Figure: Ultrasound image during MW ablation with bubles showing termal ablation.



Non-Vascular interventional Radiology
SB-41

CT-GUIDED PERCUTANEOUS MICROWAVE ABLATION OF OSTEOID OSTEOMA: A SINGLE-CENTER EXPERIENCE

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Introduction and purpose: Osteoid osteoma is the most common primary bone tumor in children and young adults, typically with a nidus surrounded by sclerosed bone and pain responds well to nonsteroidal anti-inflammatory therapy[1]. Conventional open surgery is often associated with bone resection, postoperative immobilization, morbidity, and the need for bone graft[2,3]. Our aim in this retrospective study is to evaluate the long-term results and efficacy of microwave ablation therapy guided by computed tomography in the treatment of osteoid osteoma in our center.

Materials and methods: The study included thirty-one symptomatic patients with osteoid osteoma who received CT-guided microwave ablation treatment between February 2022 and July 2023 in Ankara Bilkent City Hospital. All procedures were performed using microwave ablation with cooling system under general anesthesia by an experienced interventional radiologist. The 11-gauge bone penetration cannula was introduced into the osteoid osteoma nidus with a drill through a coaxial system. The electrode was performed at 100 ° C for 2-3 minutes. We recorded tumor location and nidus width. Patients were monitored using a numerical pain scale in the fourth week and sixth month after the procedure.

Results: In all patients, ablation was performed by successfully placing the needle in the nidus, and technical success was achieved. There were no major or minor complications. No recurrence was observed in our patients during follow-up. The group consisted of 10 (32,26%) women and 21 (67,74%) men. The mean age was 20.19 years old and the mean nidus diameter was 6,46 mm. There were 18 cortical niduses, 7 intramedullary niduses, and 5 corticomedullary niduses. The lesions were located in the femur (n = 18), tibia (n = 7), humerus (n = 1), scapula (n = 1), iliac crest (n=2), calcaneus (n=1), and ulna (n = 1).

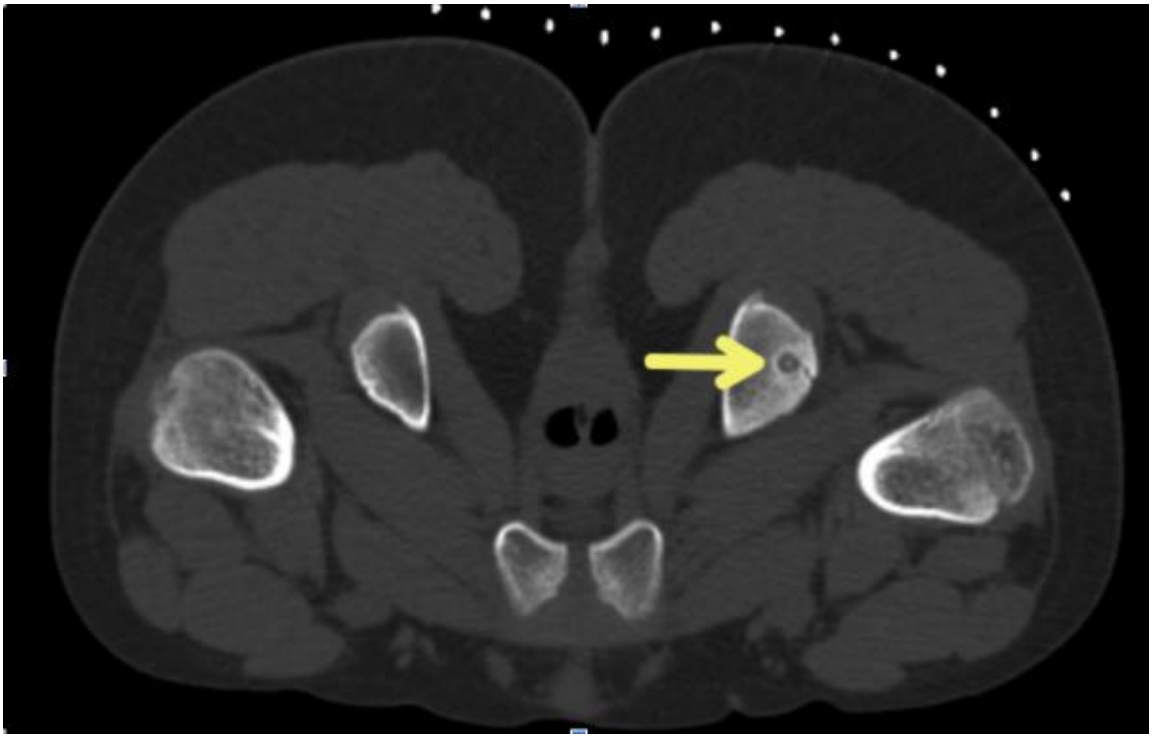
Conclusion: Percutaneous CT-guided microwave ablation of osteoid osteoma is a highly effective and safe minimally invasive treatment for osteoid osteoma[4,5]. It has excellent outcomes and short hospitalization time. Complications and recurrence rates of the procedure are low[4,5]. Parisot, Lucie et al., and Chahal, Rinzler, Elliot S et al. reported high clinical and technical success. In our study, we had good clinical outcomes, and no major complications or recurrence were observed.

Keywords : Interventional radiology, Osteoid Osteoma, Microwave ablation, Percutaneous treatment

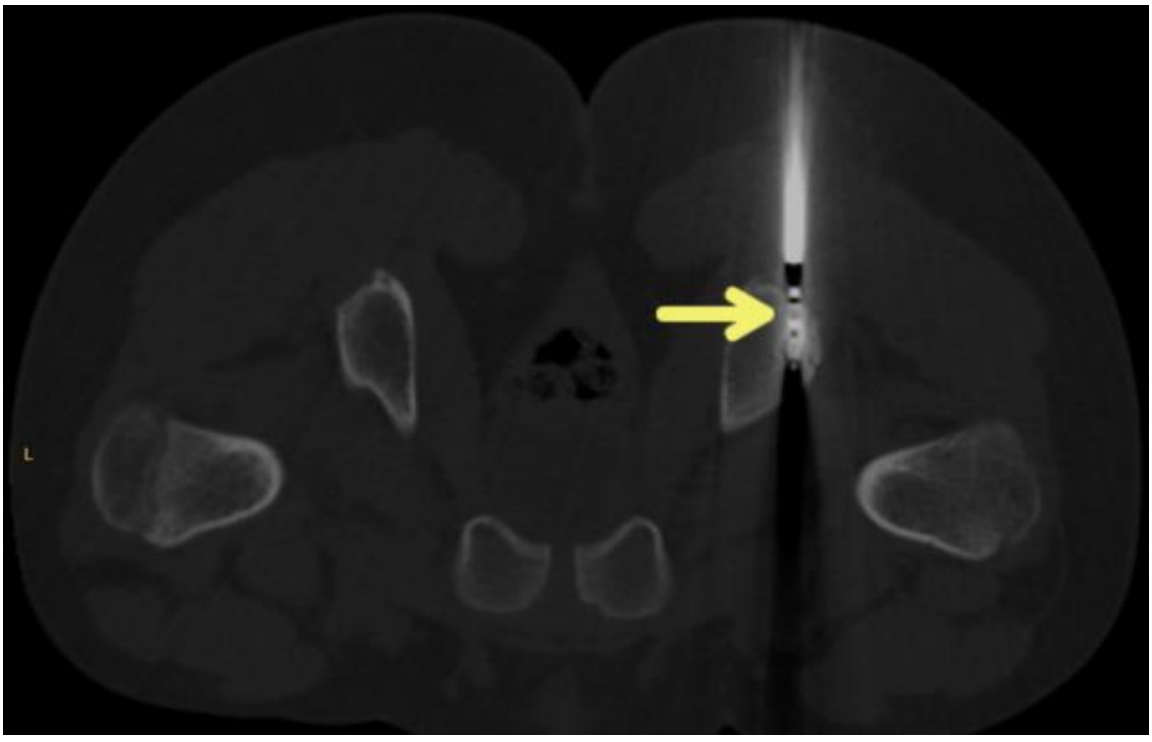
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Figure:

Description of the Figure: Osteoid osteoma in pubic bone



Description of the Figure: Microwave ablation cannula in nidus



Non-Vascular interventional Radiology
SB-42

LYMPHANGIOGRAPHY AND LYMPHATIC EMBOLIZATION FOR THE TREATMENT OF LYMPHATIC LEAKAGE: A SINGLE-CENTER EXPERIENCE

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Purpose: Lymphangiography and lymphatic embolization are established treatments for chylothorax and chylous ascites, presenting a clinical challenge[1]. This study outlines the outcomes of lymphangiography and lymphatic embolization in the treatment of lymphatic leakage.

Material and methods: A retrospective analysis was conducted on 36 cases from May 2020 to May 2023 presenting with lymphatic leakage resulting in chylothorax and chyloperitoneum. All patients underwent intranodal lymphangiography, with a 21G needle inserted into the bilateral inguinal lymph nodes under ultrasound guidance. Transnodal injection was additionally performed using cervical and axillary lymph nodes in three cases. Subsequently, ethiodized oil (Lipiodol®) was injected under fluoroscopy(fig1). In cases where feasible, additional embolization with glue and/or coil was performed, allowing for cisterna chyli transabdominal puncture or retrograde catheterization of the ductus thoracicus via a transvenous approach due to visible venous insertion points(fig2,3,4). The inherent embolic properties of the oil-based contrast used in lymphangiography contribute to the therapeutic nature of the procedure[2]. Demographic details, procedural techniques, lymphangiographic findings, and clinical outcomes were meticulously recorded.

Results: Among our 36 patients (17 female, 19 male; mean age:49.5), 31 had chylothorax, 3 had chyloperitoneum, and 2 had both conditions(table1,2). Etiologies included tumoral invasion (2 patients), idiopathic causes (5 patients), and surgical or non-surgical trauma (29 patients). Notably, 19 cases were linked to oncologic surgery, while 9 resulted from non-oncologic surgery(table2). Among the patients, 20 underwent direct lymphatic embolization, 5 received transvenous retrograde thoracic ductus embolization, and 5 underwent transnodal embolization. In 8 cases, no embolization was possible, and only transnodal Lipiodol injection was administered. In 30 out of 36 patients, the cisterna chyli was visualized, and direct puncture was performed in 20 cases(table3). Inability to puncture the cisterna chyli resulted from rapid contrast media washout and technical/anatomical challenges. 28 patients underwent a single intervention, while eight patients underwent two interventions(table4). 13 patients in the cohort showed persisted lymphatic leakage and 3 of them underwent surgical ductal ligation. 10 patients showed no improvement in lymphatic leakage, and among them, 5 died during follow-up, resulting in a 50% mortality rate in the untreated group(table5). Notably, none of the treated patients experienced mortality. A complication arose in one patient, as an inadvertent puncture of the gallbladder resulted in bile leakage, necessitating a cholecystostomy and subsequent follow-up.

Conclusion: Lymphangiography and embolization emerge as safe, moderately effective, and minimally invasive approaches in treating lymphatic leakage.

Keywords : lymphangiography, embolization, lymphatic leak, ductus thoracicus.

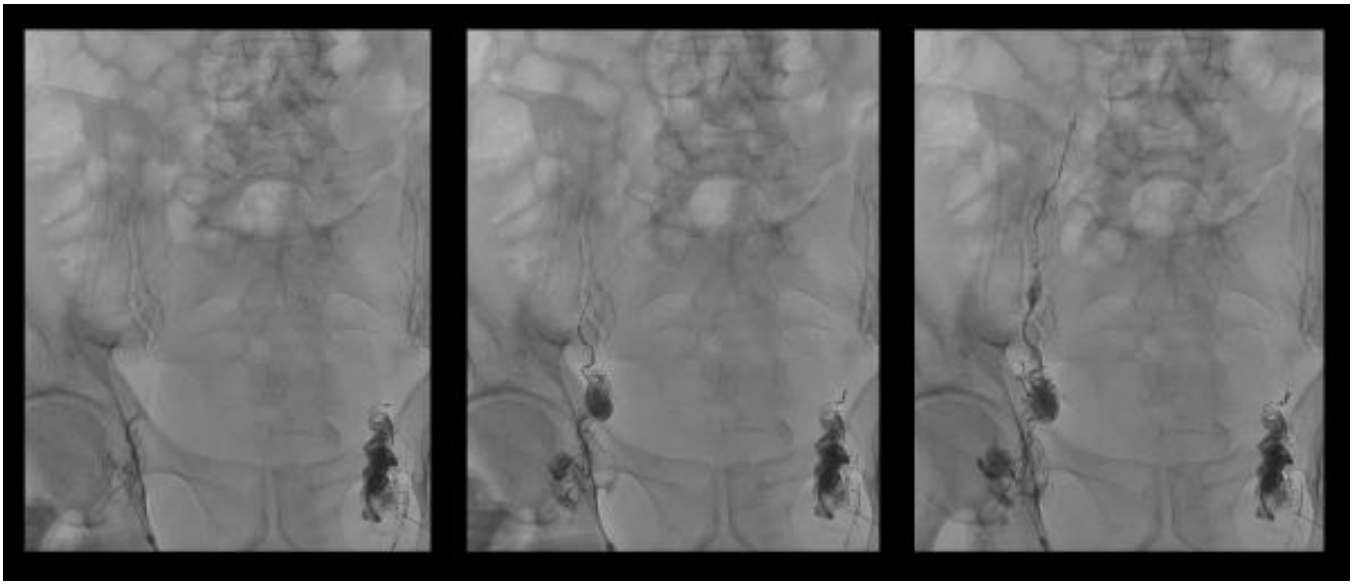
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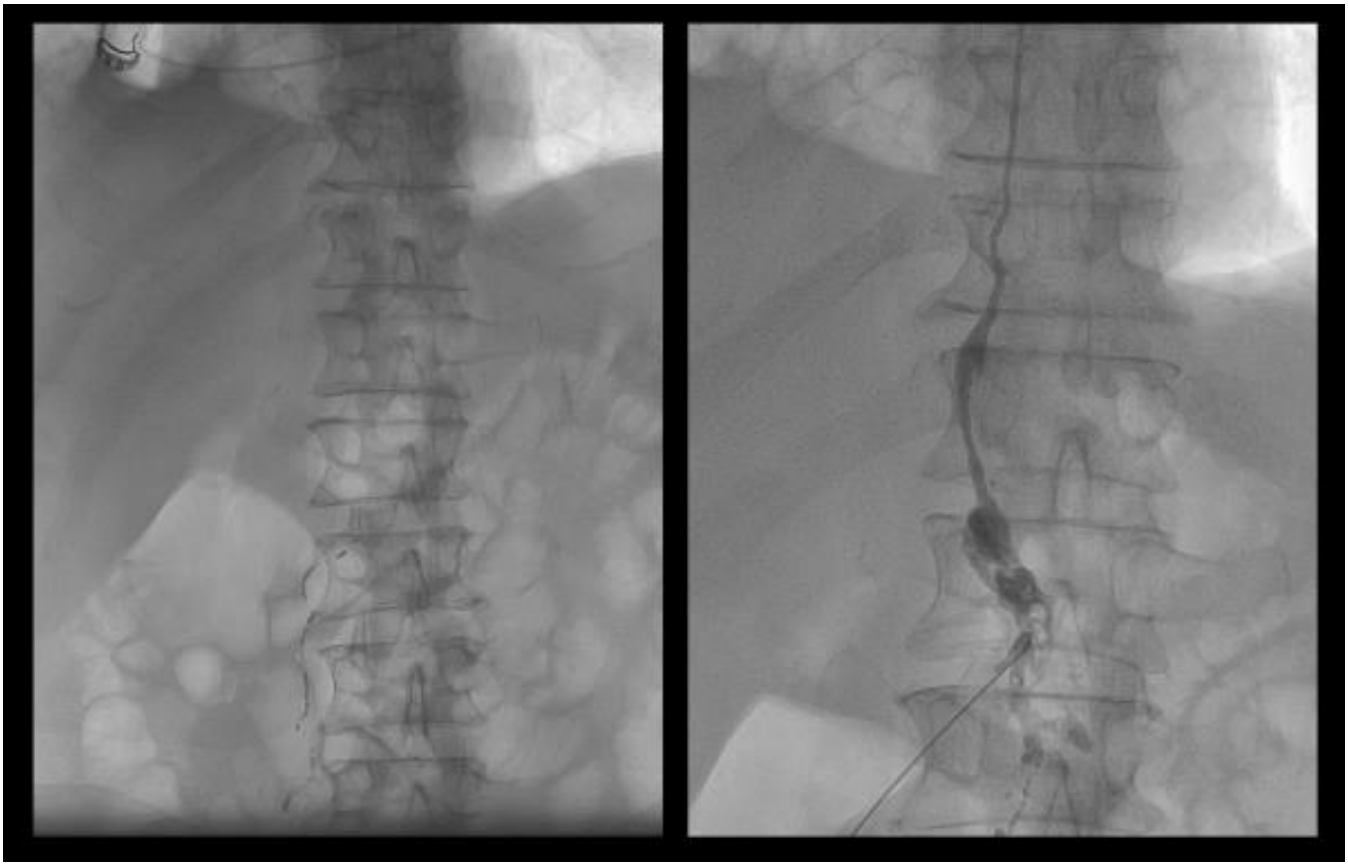
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Figure:

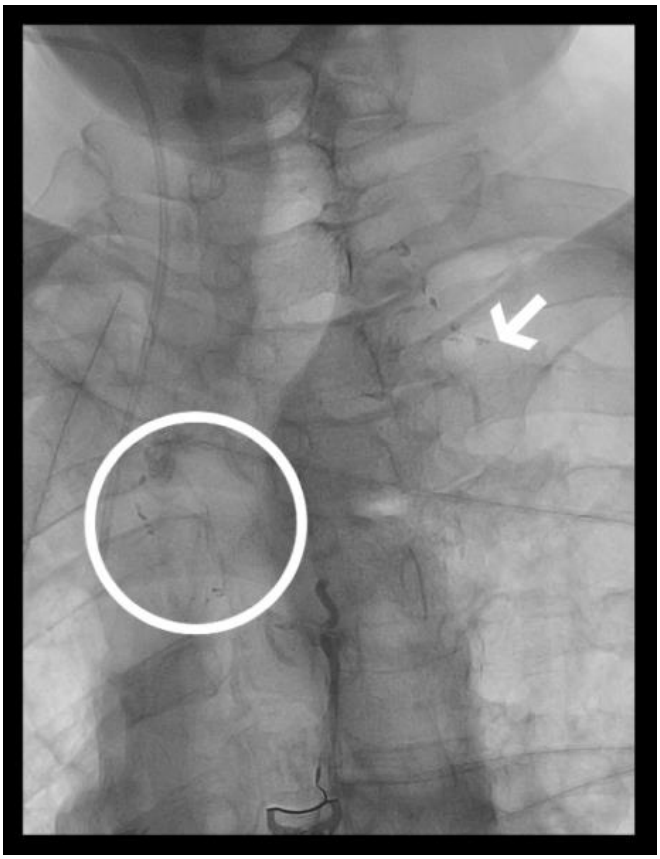
Description of the Figure: Figure1. Following bilateral inguinal lymph node puncture, intranodal lymphangiography reveals the visualization of inguinal and pelvic lymph nodes, along with opacification of lymphatic vessels.



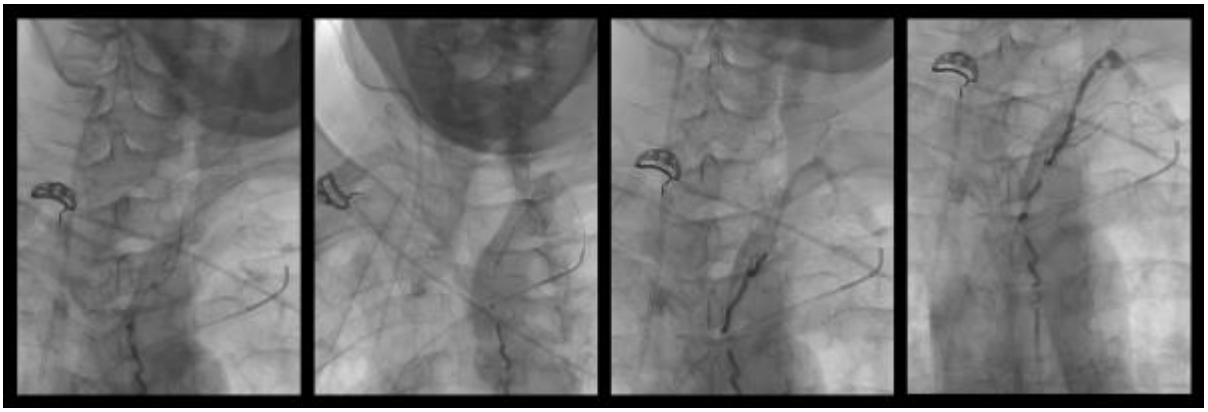
Description of the Figure: Figure2. Following right inguinal intranodal lymphangiography and subsequent opacification of the pelvic and right para-aortic lymphatic chain, visualization of cisterna chyli filling is observed at the L1 level. Subsequently, thoracic duct glue embolization is performed through cisterna chyli puncture.



Description of the Figure: Figure3. Following inguinal intranodal lymphangiography, opacification of the thoracic duct is observed, leading to lipiodol leakage into the right hemithorax (indicated by the white circle). Additionally, opacification of the right-sided lymphatic duct at the right venous angle is noted (indicated by the white arrow).



Description of the Figure: Figure4. Transvenous retrograde thoracic duct embolization. In the same patient as depicted in Figure 3, following the opacification of the right-sided lymphatic duct at the right venous angle, catheterization of the thoracic duct is observed through the right femoral vein entry using a microcatheter and microguidewire. Subsequently, embolization of the thoracic duct is performed with glue.



Tables:

Table1. Patient Demographics

Age	n
Mean	49.5
Median	50
Range	6-82
Gender	
Male	19
Female	17

Table2. Indication and Etiology

Indication	**n (%)**
Chylothorax (only)	31 (86.1)
Chyloperitoneum (only)	3 (8.3)
Chylothorax and Chyloperitoneum	2 (5.6)
Etiology	
A. Traumatic	29 (80.6)
Oncologic Surgery	19 (52.3)
→Lung Cancer	11 (30.6)
→Esophageal Cancer	5 (13.9)
→Abdominal Cancer	2 (5.6)
→Neck Cancer	1 (2.8)
Non-oncologic Surgery	9 (25)
→Cardiac	5 (13.9)
→Other	4 (11.1)
Non-surgical Trauma	1 (2.8)
B. Idiopathic	5 (13.9
C. Malignant Infiltration of Thoracic Duct	2 (5.6)
Time to First Onset After Surgery (days)	
Mean	19.4
Median	13
Range	3-120

Table3. Imaging findings

Choice of Access for Transnodal Lymphangiography	**n**
Inguinal Lymph Node	36
Cervical or Axillary Lymph Node	3
Visualization of Cisterna Chyli	30
Direct Puncture of Cisterna Chyli	20
Reasons for Avoided or Failed Puncture	
Rapid Contrast Media Wash-out	2
Technical / Anatomical Reason	4
No Visible Leakage / Seek for Alternative Access	4
Retrograde Transvenous Lymphangiography	
Tried	9
Succeed	6

Table4. Embolization method and additional interventions

	Lympathic Embolization (only)	**Transnodal Embolization (only)**	**Transvenous Retrograde Embolization (±others)**	None (Lipiodol® only)
Number	19	4	5	8
NBCA (Glue), n (%)	19 (100)	4 (100)	5 (100)	0
Coil, n (%)	0	0	3 (60)	0
Persistent Leakage After First Intervention, n (%)	9 (47.4)	4 (100)	2 (40)	
Second Intervention, n (%)	4 (21.1)	3 (75)	1(20)	
Persistent Leakage (Final), n (%)	9 (47.4)	2 (50)	1(20)	

Table5. Prognosis & outcome

	Persisted	**Not Persisted**
Number of patients	13	23
Surgical Ductal Ligation, n	3	0
Deaths, n	5	0

Neurointerventional Radiology
SB-43

ASSOCIATION OF HYPERDENSE MCA SIGN WITH THE NUMBER OF PASSES IN THE MECHANICAL THROMBECTOMY PROCEDURE AND POSTOPERATIVE TICI SCORE

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OBJECTİVE: Acute stroke is a common and important cause of morbidity and mortality. Hyperdense appearance of the middle cerebral artery on non-contrast tomography is the earliest marker of mca infarction and is seen within 90 minutes after the event. Mechanical thrombectomy is one of the most important treatments at an early stage in these patients. In this study, we investigated the association of hyperdense middle cerebral artery (HMCA) appearance on non-contrast brain tomography with the number of passes in the mechanical thrombectomy procedure and post-procedural TICI score in acute stroke patients undergoing mechanical thrombectomy.

METHODS AND MATERİALS: A retrospective analysis of CT and mechanical thrombectomy procedure data of 107 patients with acute MCA occlusion who underwent mechanical thrombectomy was performed. HMCAS was determined by visual assessment with consensus of two readers. HMCAS were classified into two groups: HMCAS and non-HMCAS. The number of passes in the mechanical thrombectomy procedure and the TICI score at the end of the procedure were analyzed with and without HMCAS. 57 of 117 (%58) patients had HMCA sign,while 50 of 117 (%42) patients had no HMCA sign. Among these patients, TICI 3, TICI 2c, TICI 2b, TICI 2a, TICI 1, TICI 0 were 61 (%57.9),17 (15.9),13 (12.1),4 (3.7),7 (6.5),5 (4.7) respectively. The number of passes was 1 in 33 patients (30.8%), 2 in 21 patients (19.6%), 3 in 17 patients (15.9%), 4 in 15 patients (14%), 5 in 14 patients (13.1%), 6 in 5 patients (4.7%), and 7 in 2 patients (1.9%). In this study, IBM SPSS statistics viewer application was used for all tests. Pearson correlation test was used to determine the strength of the relationship between two variables and the extent of their relationship with each other and independent t test was used to test whether there was a statistically significant difference between two independent groups by looking at the means.

RESULTS: In the study, TICI score was significantly higher in patients with HMCA (p=0.004). In addition, the number of passes was significantly lower in patients with HMCA (p=0.001). Independent t-test results also supported the Pearson correlation test and revealed that the difference was significant.

CONCLUSİON: It was concluded that acute stroke patients with HMCA sign had fewer passes in the mechanical thrombectomy procedure and a higher TICI score was obtained at the end of the procedure.

Keywords : HYPERDENSE MCA SIGN, TICI SCORE, HMCA SIGN, ACUTE ISCHEMIC STROKE, MECHANICAL TROMBOECTOMY

Neurointerventional Radiology
SB-44

THE EFFECT OF ARTIFICIAL INTELLIGENCE ON DOOR-TO-PUNCTURE TIME IN PATIENTS WITH THROMBECTOMY INDICATION IN LARGE VESSEL OCCLUSİON ACUTE ISCHEMIC STROKE

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Introduction: Recently, deep learning-based artificial intelligence(AI) studies are considerably used in the health sector as well as in every field. Software used in the management of acute stroke diagnosis and treatment steps; Computed Tomography and Magnetic Resonance Imaging are used to detect bleeding areas, diffusion restrictive areas and large vessel occlusions (LVO). Time is an important factor for the benefit of endovascular trombectomy (EVT) in LVO ischemic strokes. LVO detection with AI is critical to accelerate in hospital workflows and door-to-puncture time.

Objective: We aimed to determine whether implementation of an LVO detection algorithm that provides immediate active notification to the interventional team through social media and mobile app would improve ischemic stroke workflow at our institution compared to our previous system.

Materiel and Methods: A retrospective review of EVT procedures performed on LVO ischemic stroke between January 2022 and May 2023 was conducted through our hospital records. Our study included 40 patients who underwent EVT in the specified time interval, 20 pre-AI and 20 post-AI, and those with ICA peak and MCA M1-M2 occlusion. Demographic information, radiological findings, hospital admission time, NIHSS values, and hospital stay duration informations were collected. The door-to-puncture time, hospital stays, and NIHSS values were compared pre, post HEVI.AI.

Findings: In our 20 patients who underwent trombectomy pre-AI, the M/F ratio was 10/10(50%), the mean age was 71.7±13.1(42-93), the mean NIHSS values was 10.3±5.6 (1-20). In our 20 patients who underwent trombectomy post-AI, the M/F ratio was 9/11 (45%), the mean age was 75.4±11.8 (49-93), the mean NIHSS score was 14.1±5.2 (4-24), and the collateral score of 8 patients was coded as good. Post-AI, the mean door-to-puncture time of the included LVO ischemic stroke patients decreased by 76 minutes, from 193 minutes to 117 minutes and was found to be statistically significant ($p = 0.035$). The NIHSS score post-AI was statistically significantly higher than the patients pre-AI (p:0.040). The mean hospital stay of patients post-AI decreased by 15 days from 34.7 days to 19.6 days, but this was not statistically significant ($p = 0.084$). The age and gender distribution of the patients did not differ significantly ($p>0.05$)

Discussion and Conclusions: AI software used in the diagnosis of LVO acute ıschemic stroke improves the time factor by supporting the diagnosis and treatment process. Automatic LVO detection with AI, supported by mobile app and social media, can improve in-hospital acute ischemia stroke workflows.

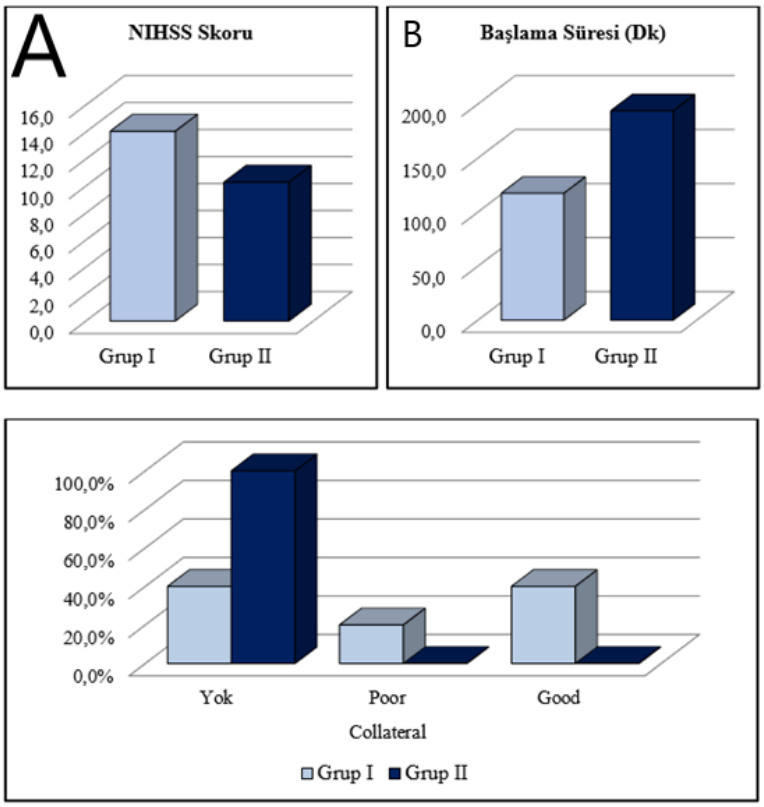
Keywords : Artificial intelligence; Ischemic Stroke; Endovascular Thrombectomy; Door to PunctureTime.

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Figure:

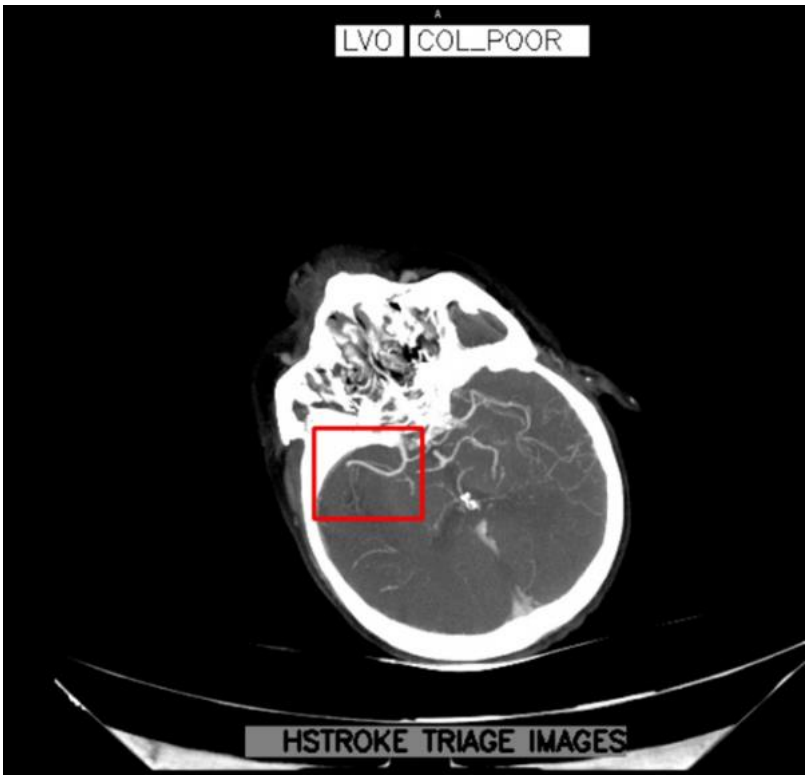
Description of the Figure: Figure 1: Comparison of two groups in terms of NIHSS (a), door-to-puncture time (b) and collateral score (c)



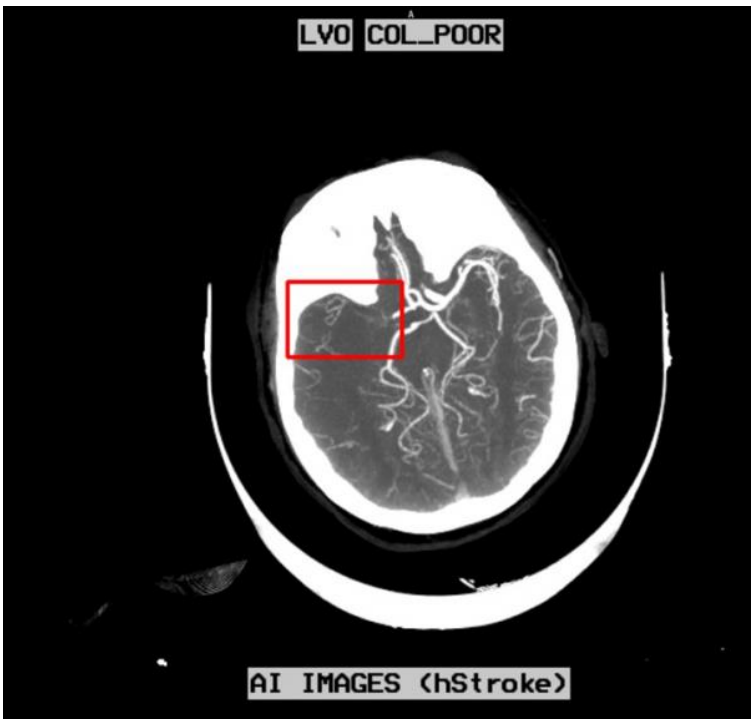
Description of the Figure: Figure 2:RİGHT MCA M1 PROXIMAL, COLLATERAL GOOD



Description of the Figure: Figure 3:RİGHT MCA M1 DISTAL, COLLATERAL POOR



Description of the Figure: Figure 4:RIGHT ICA PEAK, COLLATERAL POOR



Description of the Figure: Figure 5: Comparison of two groups demographic findings, NIHSS values, door-to-puncture time, hospital stay, collateral score

		Group I			Group II			p	
		Mean.±ss/n-%		Median	Mean.±ss/n-%		Median		
Age		75,4 ± 11,8		74,0	71,7 ± 13,1		73,0	0,432	m
Gender	Woman	11	55,0%		10	50,0%		0,752	X²
	Man	9	45,0%		10	50,0%			
NIHSS Score		14,1 ± 5,2		15,0	10,3 ± 5,6		10,0	***0,040***	t
Starting Time (min)		117,5 ± 68,2		112,5	193,8 ± 145,6		166,5	***0,035***	m
Hospital Stay		19,6 ± 14,1		16,0	34,7 ± 30,3		25,5	0,084	t
Collateral Score	None	8	40,0%		20	100,0%		***0,000***	X²
	Poor	4	20,0%		0	0,0%			
	Good	8	40,0%		0	0,0%			

t Independent Samples t test / m Mann-whitney u test / X^2 Chi-square test

Neurointerventional Radiology
SB-45

CAROTID ARTERY STENTING IN NEAR OCCLUSION: A SINGLE-CENTER EXPERIENCE

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[1]Basaksehir Cam And Sakura City Hospital

Purpose: Near occlusion of the carotid artery, characterized by a diminished internal carotid artery diameter beyond prominent stenosis, poses a clinical challenge(1). This study evaluates the effectiveness and safety of carotid artery stenting in cases of near occlusion without collapse.

Material and Methods: From May 2020 to July 2023, we conducted a retrospective analysis of 250 individuals with stenosis in the extracranial internal carotid artery who underwent carotid artery stenting. Among these, 18 patients with near-occlusion were identified based on findings from digital subtraction angiography, computed tomography angiography, and magnetic resonance angiography, as well as the presence of criteria indicating near-occlusion without collapse.Near occlusion of the carotid artery manifests in two subtypes: the severe form exhibits with collapse and a distal ICA lumen resembling a thread, while the partial form lacks collapse, presenting a narrowed but otherwise normal-appearing distal ICA lumen(2). NASCET employed descriptive parameters to differentiate near-occlusion, with or without collapse, from typical stenosis.These criteria included: presence of intracranial collaterals, delayed filling, distal ICA on the ipsilateral side being smaller than that on the contralateral side, and distal ICA on the ipsilateral side equal to or smaller than the ipsilateral ECA.Diagnosis necessitated meeting at least two out of the four criteria(1). Patient characteristics, technical success, perioperative complications, side of near occlusion, contralateral internal carotid artery status, predilation, and stent details were recorded.

Results: The patient cohort included 13men(72.2%) and 5women(27.8%), with an average age of 68.3 years(ranging from 57 to 80 years). Of these patients, 10 were symptomatic (55.6%), while 8 were asymptomatic(44.4%). Table1 and 2 summarize patient data and imaging findings. Figures 1,2,3,4 show examples of right and left near occlusion. Distal embolic protection device was used and postdilatation was performed in all patients. In one patient, the procedure was performed through radial artery access(fig5), while in the remaining cases, intervention was carried out via femoral artery access. In two patients, bilateral internal carotid artery stenting was performed, while in another patient, two stents were used on the same side. Notably, no complications were observed in any of the patients. Postoperatively, transient hypotension occurred in two patients, while temporary bradycardia developed in one patient. In-stent stenosis developed 7 months following the procedure in one patient(fig6).

Conclusion: Carotid artery stenting appears to be a technically viable and efficacious approach in individuals with proximal occlusion, demonstrating its potential to prevent recurrent strokes. Carotid artery stenting for near occlusion without collapse emerges as a feasible and safe technique, showing promise in addressing such conditions securely.

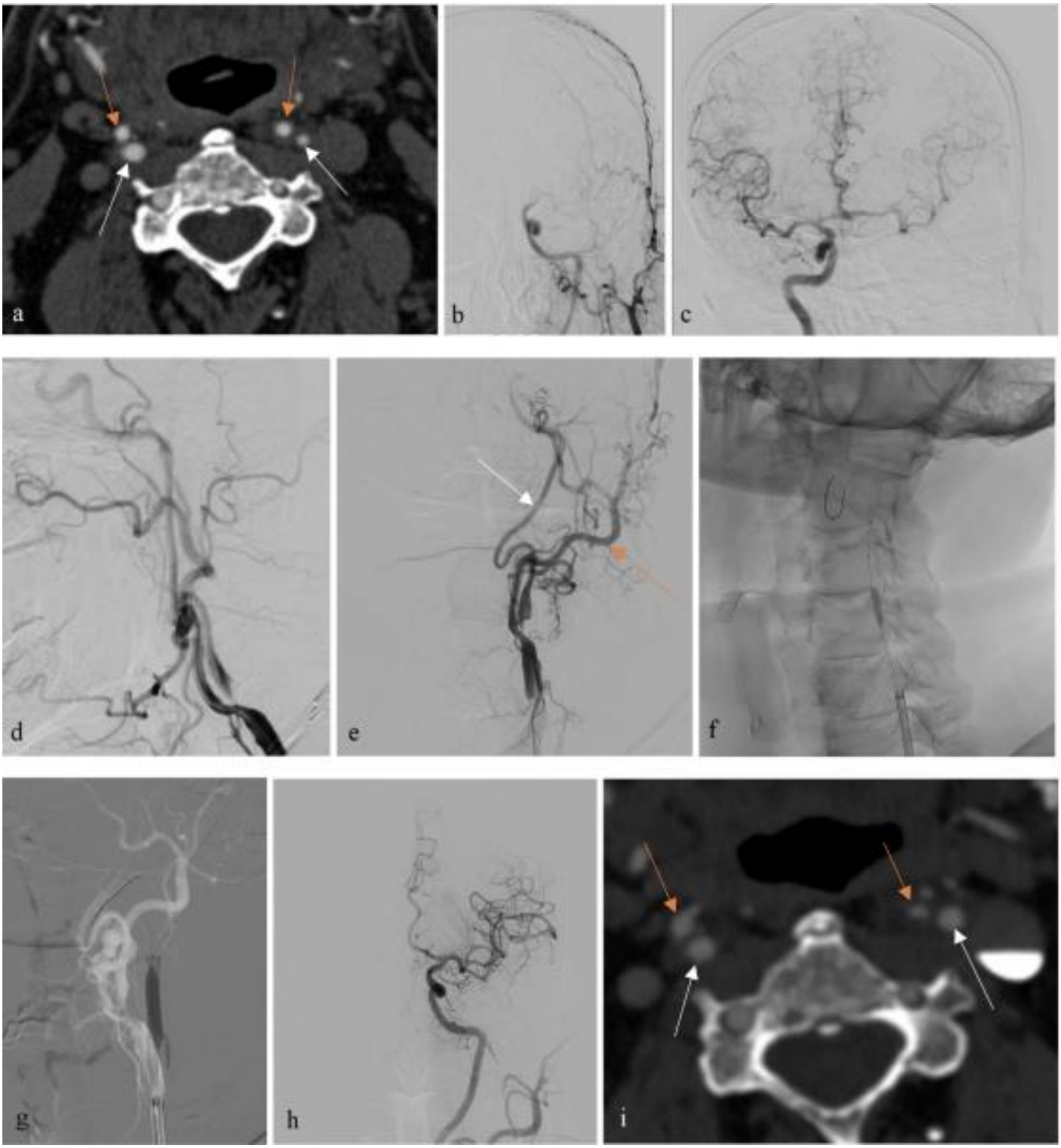
Keywords : Carotid artery stenosis, Near occlusion, Carotid artery stenting.

References:

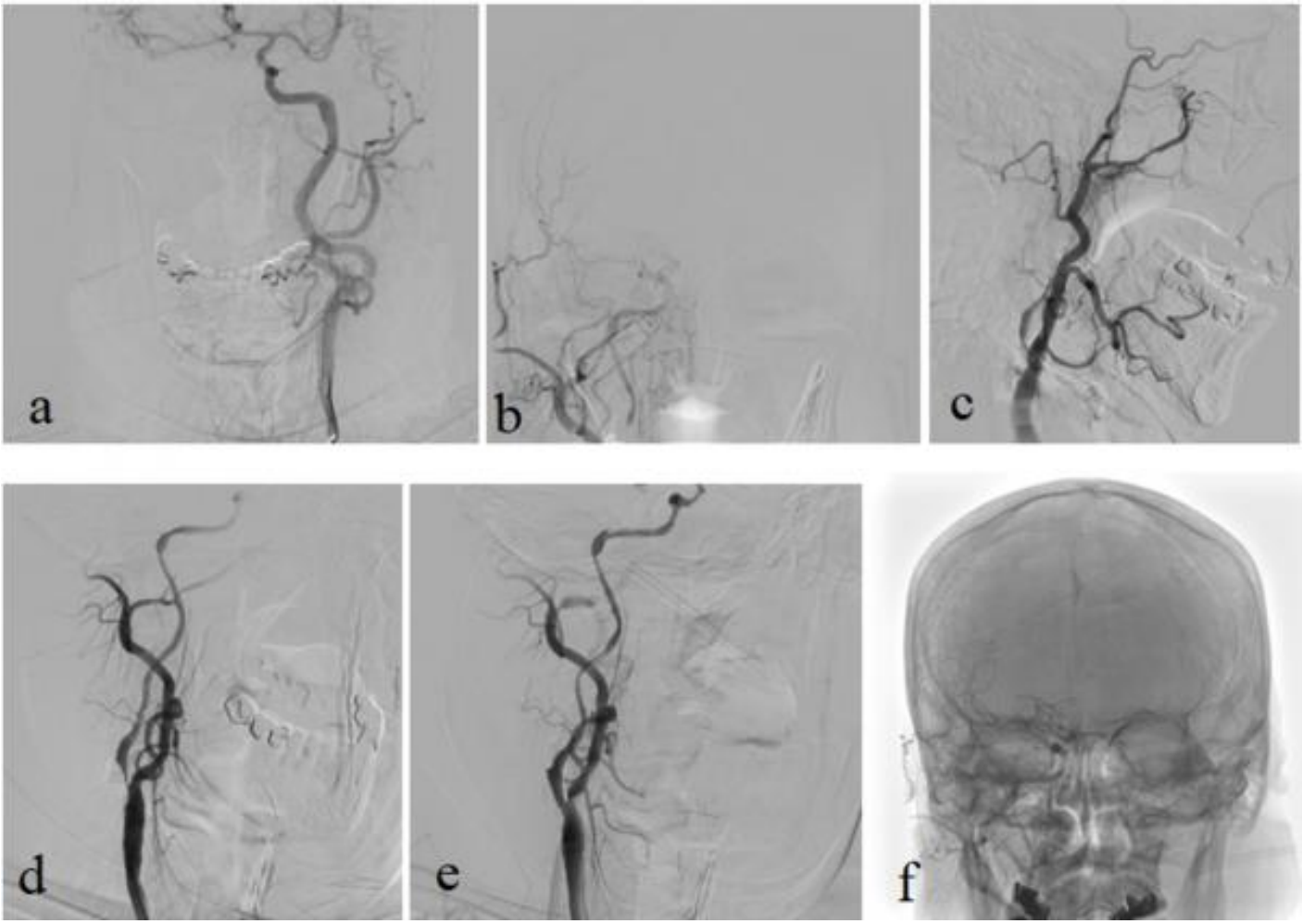
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Figure:

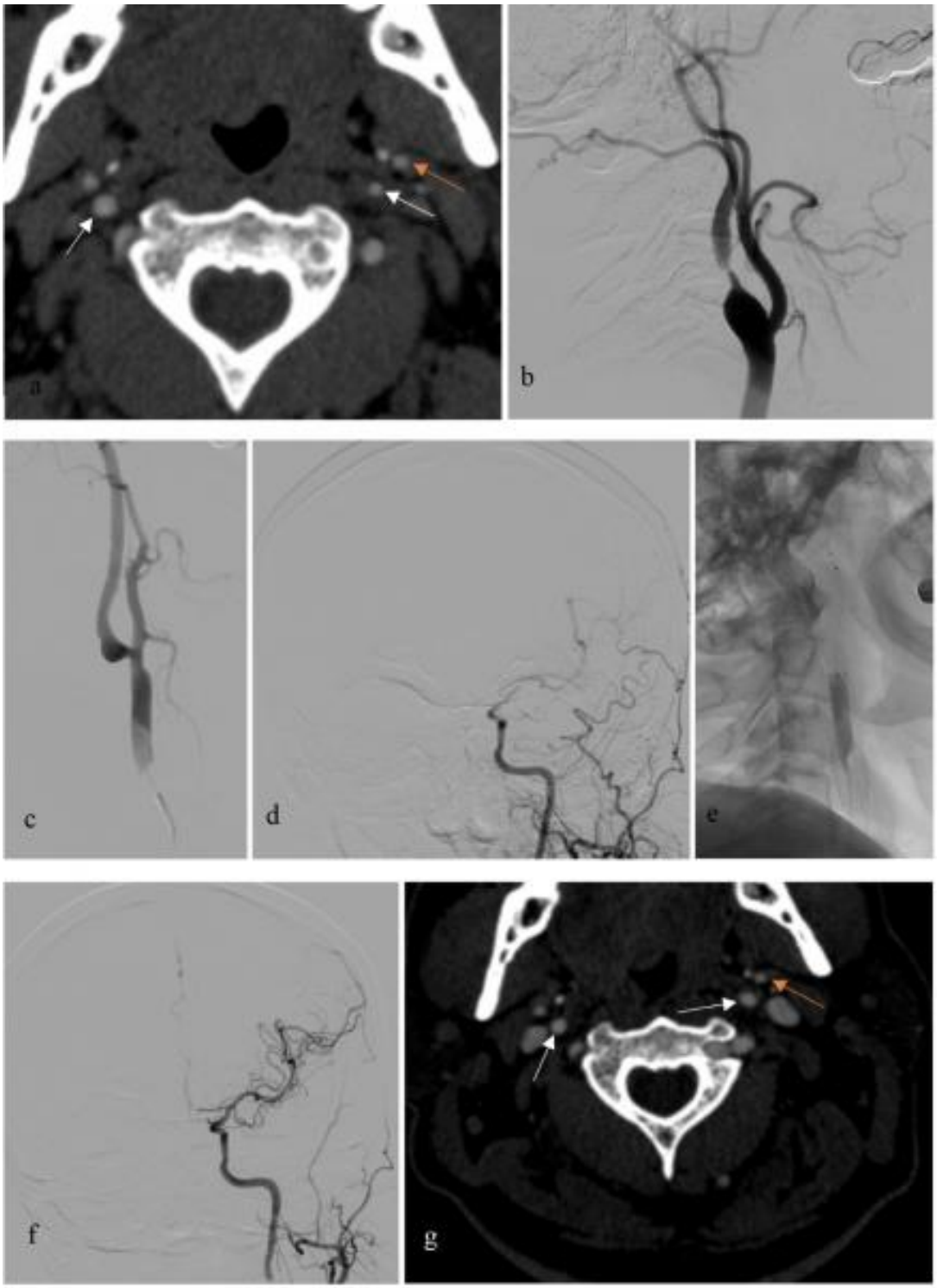
Description of the Figure: Figure1. Near occlusion is observed in the ICA without collapse. A. Preprocedural CTA shows left ICA smaller than ipsilateral ECA and contralateral ICA. B. Left AP angiogram: Delayed filling in distal left ICA compared to ECA. C. Cervical angiogram from right ICA reveals left MCA filling from right side. D, E. Cervical projections show near occlusion of left ICA and smaller diameter compared to ipsilateral ECA. F, G. Balloon angioplasty precedes stent placement to address stenosis; in-stent balloon dilatation follows. H. Post-procedure angiogram displays restored intracranial blood flow. I. CTA 7 months later shows improved left ICA diameter(White arrow: ICA, Red arrow: ECA).



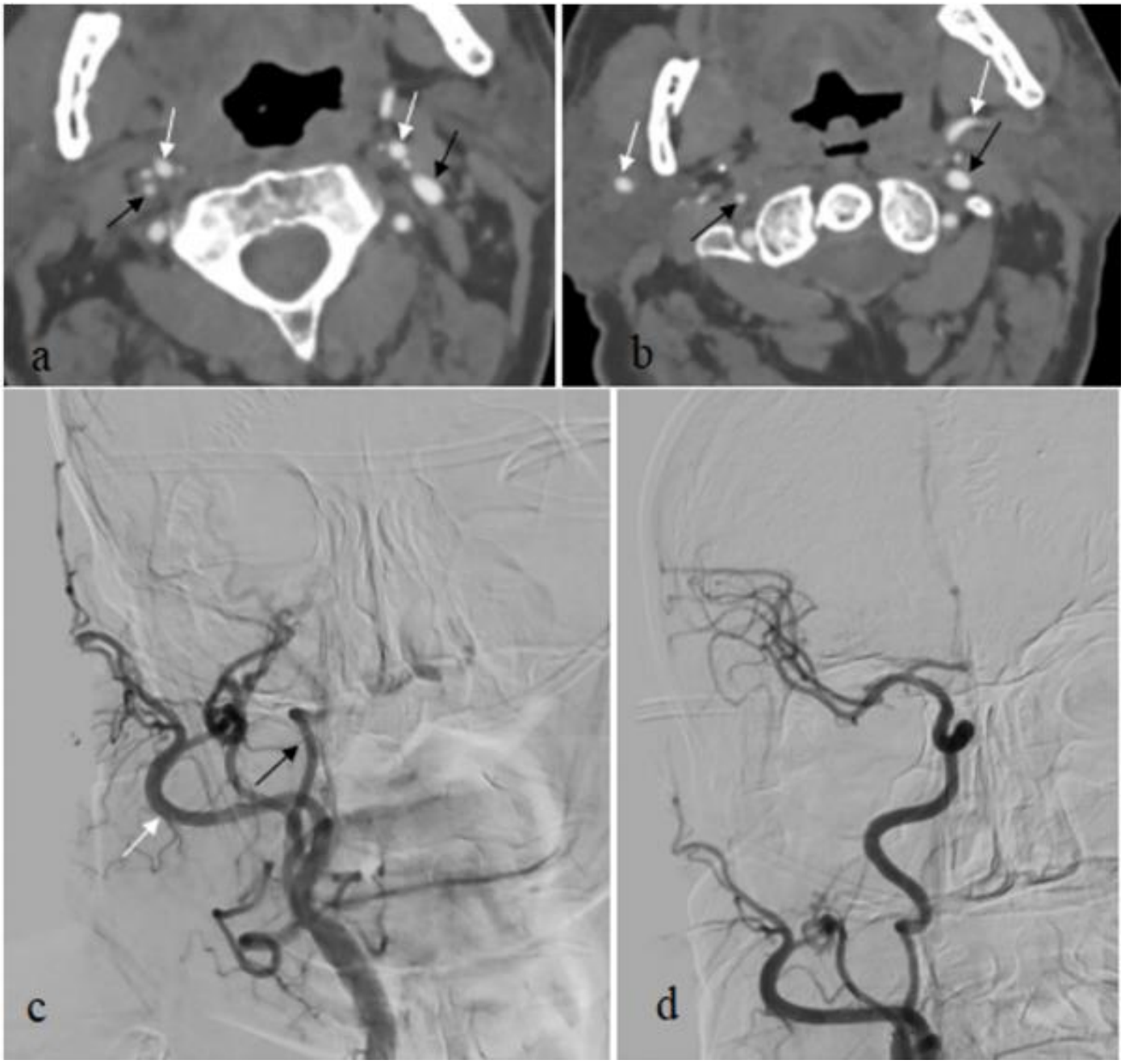
Description of the Figure: Figure2. A. In the anterior-posterior cervical angiogram taken from the right CCA, filling from the left side through the anterior communicating artery is observed in the right cerebral hemisphere without collapse. B. In the anterior-posterior cranial angiogram obtained from the right CCA, delayed filling of the distal left ICA compared to the ECA is noted. C, D. Anterior-posterior and lateral cervical angiograms reveal a near-occlusion in the proximal left ICA, and the calibration of the left ICA is less than that of the ipsilateral ECA. E, F. Following stent angioplasty for left ICA stenosis, the anterior-posterior angiogram shows restoration, and on the non-subtractive cranial angiogram, the right MCA and its branches demonstrate restoration after stent angioplasty, respectively.



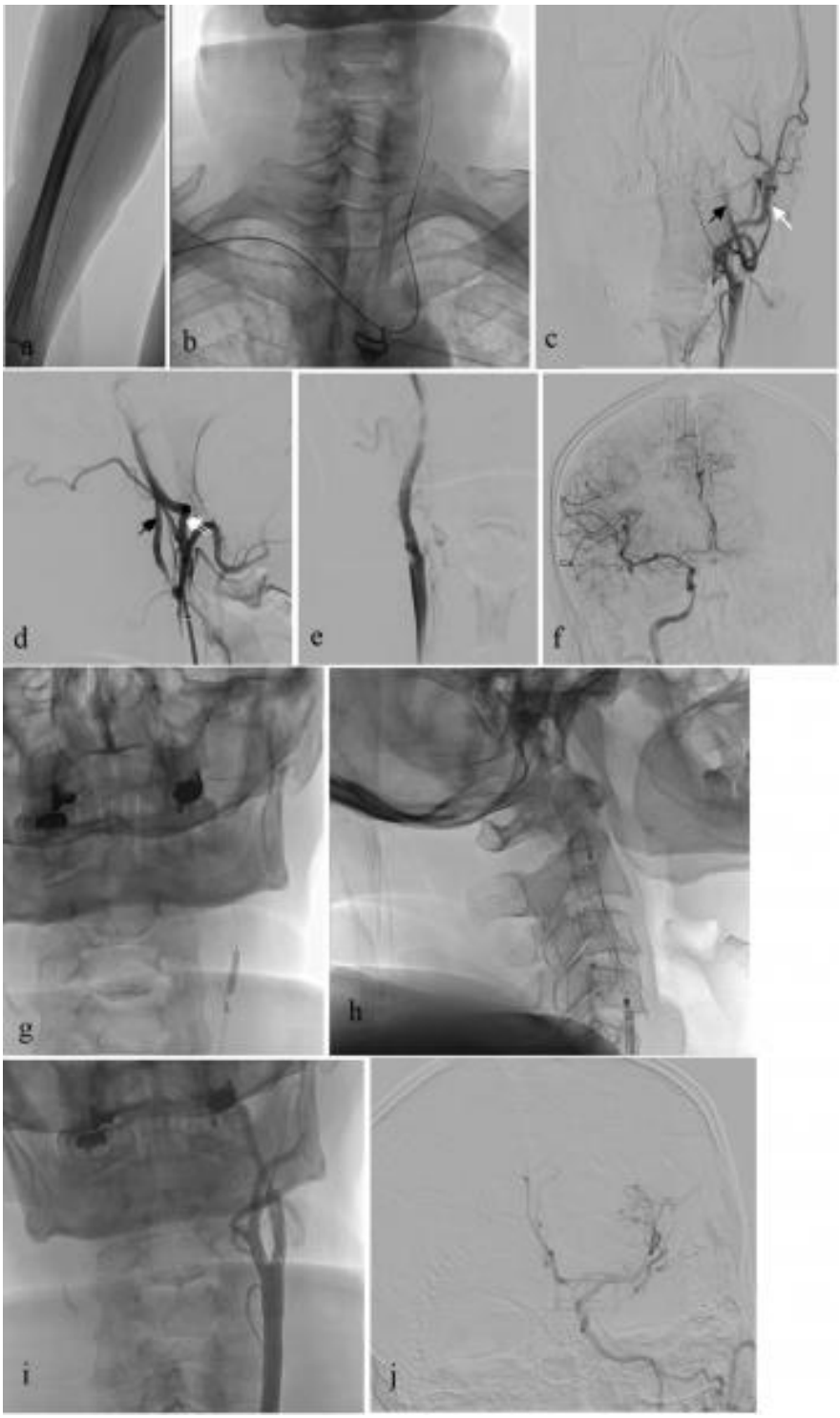
Description of the Figure: Figure3. Left ICA near occlusion without collapse. A. Preprocedural CTA reveals that the diameter of the left ICA is smaller than that of the ipsilateral ECA and the contralateral ICA. B. The left lateral projection of the cervical angiogram demonstrates near occlusion of the left ICA. C. The right AP projection of the cervical angiogram shows moderate stenosis in the right ICA. D. In the digital subtraction angiography image obtained from the left CCA, delayed filling in the distal left ICA compared to the ECA is observed. E. The lateral projection of the cervical region demonstrates in-stent balloon angioplasty. F. After the procedure, the anteroposterior cranial angiogram shows the restoration of intracranial blood flow. G. CTA obtained 2 months after the procedure shows an improvement in the diameter of the left ICA (white arrow: ICA, red arrow: ECA).



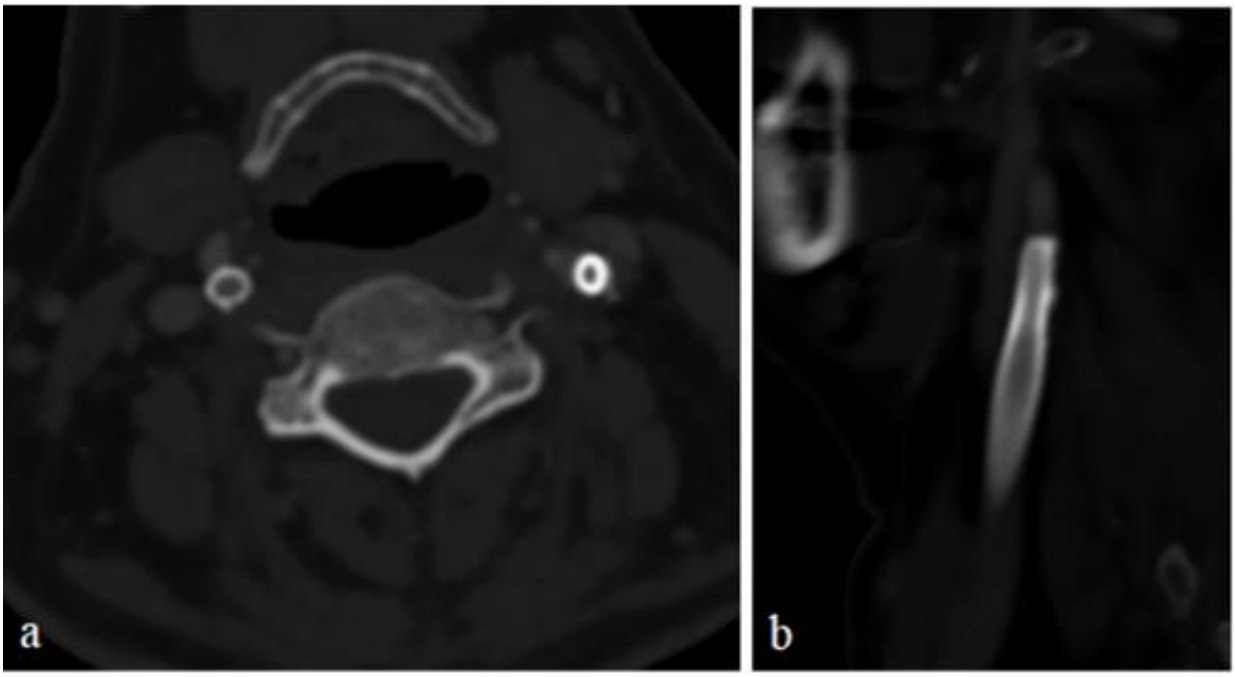
Description of the Figure: Figure 4. A,B. Preprocedural CTA reveals that the ICA diameter is smaller than that of the ipsilateral ECA and the contralateral ICA in a patient with near-occlusion without collapse of the right ICA. C. The contrast filling in the right ICA is observed with a delayed onset compared to the filling in the right ECA and its branches. D. Following the right ICA stent angioplasty procedure, a restoration in the flow of the right ICA is noted in the post-procedural run. (black arrows: ICA, white arrows: ECA).



Description of the Figure: Figure 5. A. Following right radial artery access, left common carotid artery (CCA) catheterization. B. In the runs obtained from the left CCA (C, D), near occlusion without collapse is observed in the left ICA, with the ICA diameter being smaller than that of the ipsilateral external carotid artery (ECA). The filling of the ICA also occurs with a delay compared to the ECA. E, F. In the run obtained from the contralateral CCA, occlusion of the right ECA is noted, along with filling of the right anterior cerebral artery (ACA) and middle cerebral artery (MCA), as well as the filling of the left ACA A1 segment. G, H. After predilatation balloon angioplasty of the narrow segment in the left ICA, stent deployment is performed, respectively. I, J. Postprocedural images reveal improvement in the diameter of the left ICA and intracranial blood flow, respectively.



Description of the Figure: Figure 6. A. axial and B. sagittal contrast enhanced CTA slices show that a stenosis within the stent on the left side was identified at the 7-month follow-up of a patient who underwent bilateral internal carotid artery (ICA) stent angioplasty.



Tables:

Table1. Patient characteristics and procedural data. *: Two stents were used for the patient. M: male, F: female, L: left, R: right.

Patient	Age	Sex	Side of the near occlusion	Pre-dilatation before stent deployment	Stent features	Status of the contralateral ICA
1	75	M	L	yes	Protégé RX 7x40	Total Occlusion
2	66	M	L	yes	Protégé RX 8-6x40	Normal
3	68	M	R	no	Precise 7x40	Moderate Stenosis
4	57	M	L	no	Protégé RX 7x40	Moderate Stenosis
5	65	M	R	yes	Protégé RX 10-7x30	Mild Stenosis
6	57	M	R	no	Protégé RX 8x40	Moderate Stenosis
7	72	M	L	yes	Protégé RX 8-6x40	Moderate Stenosis
8	79	M	L	yes	Protégé RX 8-6x40	Total Occlusion
9	58	M	R	no	Precise 7x30	Mild Stenosis
10	73	F	R	no	Wallstent 7x30	Mild Stenosis
11	62	F	L,R	yes	Wallstent 9x40	Severe Stenosis
12	70	M	L	no	Wallstent 9x30	Mild Stenosis
13	68	F	L	no	Protégé RX 8-6x30	Mild Stenosis
14*	80	M	R	yes	Wallstent,Protégé RX 7x40, 7x30	Mild Stenosis
15	80	M	L,R	yes	Wallstent 9x30	Severe Stenosis
16	59	F	L	no	Protégé RX 8-6x30	Normal
17	73	M	L	no	Protégé RX 8-6x30	Mild Stenosis
18	70	F	L	yes	Protégé RX 10-7x30	Normal

Table 2. Imaging findings in carotid near occlusion without collapse. *: not applicable in two patients due to contralateral total occlusion.

Findings	n	%
Reduced ICA caliber in comparison to the diameter of the corresponding ipsilateral ECA	18	100
Reduced ICA caliber in comparison to the diameter of the corresponding contralateral ICA* Reduced ICA caliber in comparison to the diameter of the corresponding contralateral ICA*	15	83
Delayed contrast filling in the distal segment of the ICA	11	61
Intracranial collateral	9	50

Neurointerventional Radiology
SB-47

CHRONIC SUBDURAL HEMATOMA EMBOLIZATION: ANALYSIS OF THE FIRST 13 CASES

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Introduction: Chronic subdural hematoma (CSDH) is one of the most encountered neurosurgical cases and is defined as a collection of blood degradation products in the subdural space. With the population aging in the world and the increased use of antiplatelet and anticoagulation drugs, CSDH is expected to be the most frequent reason for emergency neurosurgery by 2030.

CSDH may cause effacement of brain structures leading to stroke-like symptoms or dementia.Surgery is effective in relieving the mass effect of hematoma but does not change the underlying pathophysiologic mechanisms, and recurrence occurs frequently.

MMA embolization is a new treatment method for CSDH.

In this study, the effect of middle meningeal artery (MMA) embolization using polyvinyl alcohol particles on chronic subdural hematoma (CSDH) is evaluated.

Materials and methods: The study included 13 patients (6 women, 7 men) who were embolized for CSDH at our institution between 2019 and 2023 years. PVA 355-500 u nonspherical particle was used in all cases.

The success of the procedure was evaluated by comparing brain CT scans taken before MMA embolization with control CT scans taken 6 months post-embolization.

Before the procedure, all patients underwent CT angiography of the head and neck to examine the anatomy of the arch and any variations and a femoral or radial approach was selected accordingly.

Embolization was performed via a radial approach in patients with severe aortic arch tortuosity or type 3 arch.

Embolization was performed by investigating the presence of foramen spinosum, the origin of the ophthalmic artery, and the presence of dangerous collaterals extending between the orbit and MMA artery with head-neck CT angiography and Digital Subtraction Angiography (DSA).

Clinical and radiologic follow-up examinations with CT scans were performed at 1, 3, and 6 months after embolization.

The maximal thickness of CSDH was measured at the level of maximum axial thickness, and midline shift was measured on the axial slices on CT images

Results: The patients ranged in age between 57 and 88 years, with a mean age of 69.5.

Unilateral CSDH was detected in 9 cases, while bilateral CSDH was detected in 4 cases.

The largest hematoma thickness was 30mm and the smallest hematoma thickness was 6.5mm.

MMA embolization was used as the primary treatment method in seven cases, while it was used to treat post-surgical recurrence and residual hematoma in six cases.

Embolization was successfully performed in all cases. No complications were observed in the early or late period.

The femoral approach was used in 9 patients and the radial approach was used in 4 patients.

In the 6th-month follow-up CT, subdural hematomas were observed to have completely regressed in 12 cases, in one case, a subdural hematoma was observed to have substantially regressed.

Conclusion: MMA embolization is seen as an effective method in the treatment of chronic subdural hematoma.

Keywords : chronic subdural hematoma, recurrence, subdural space

References :

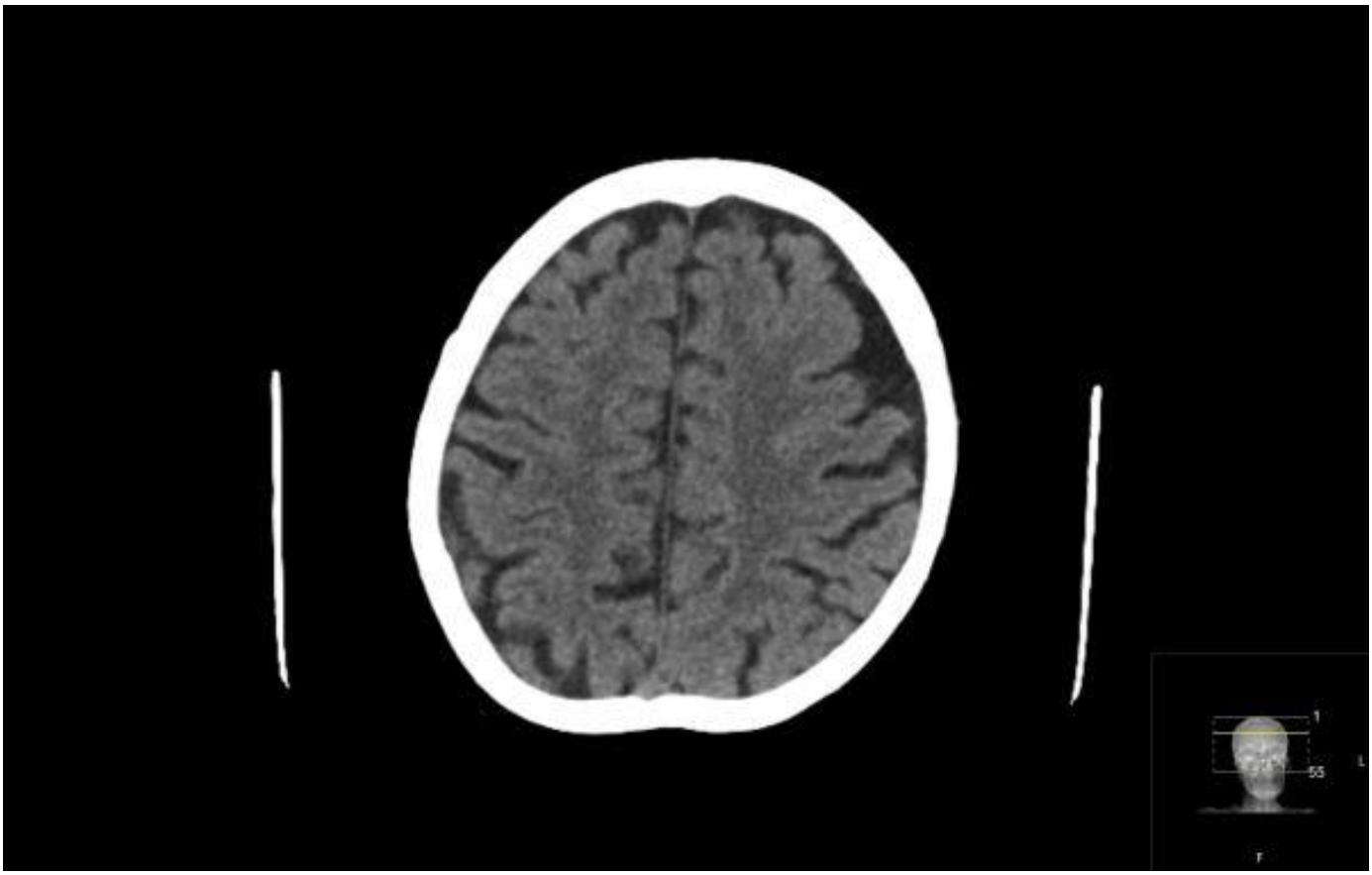
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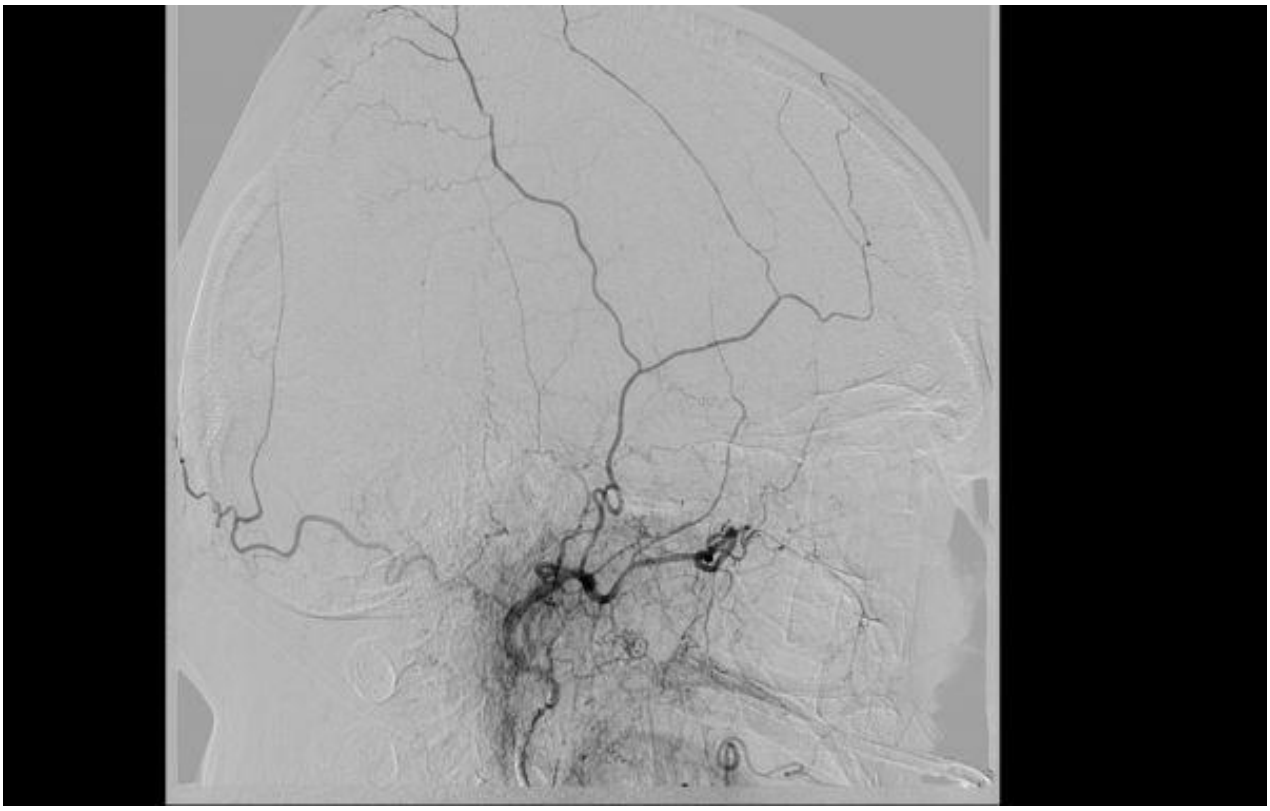
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Figure :

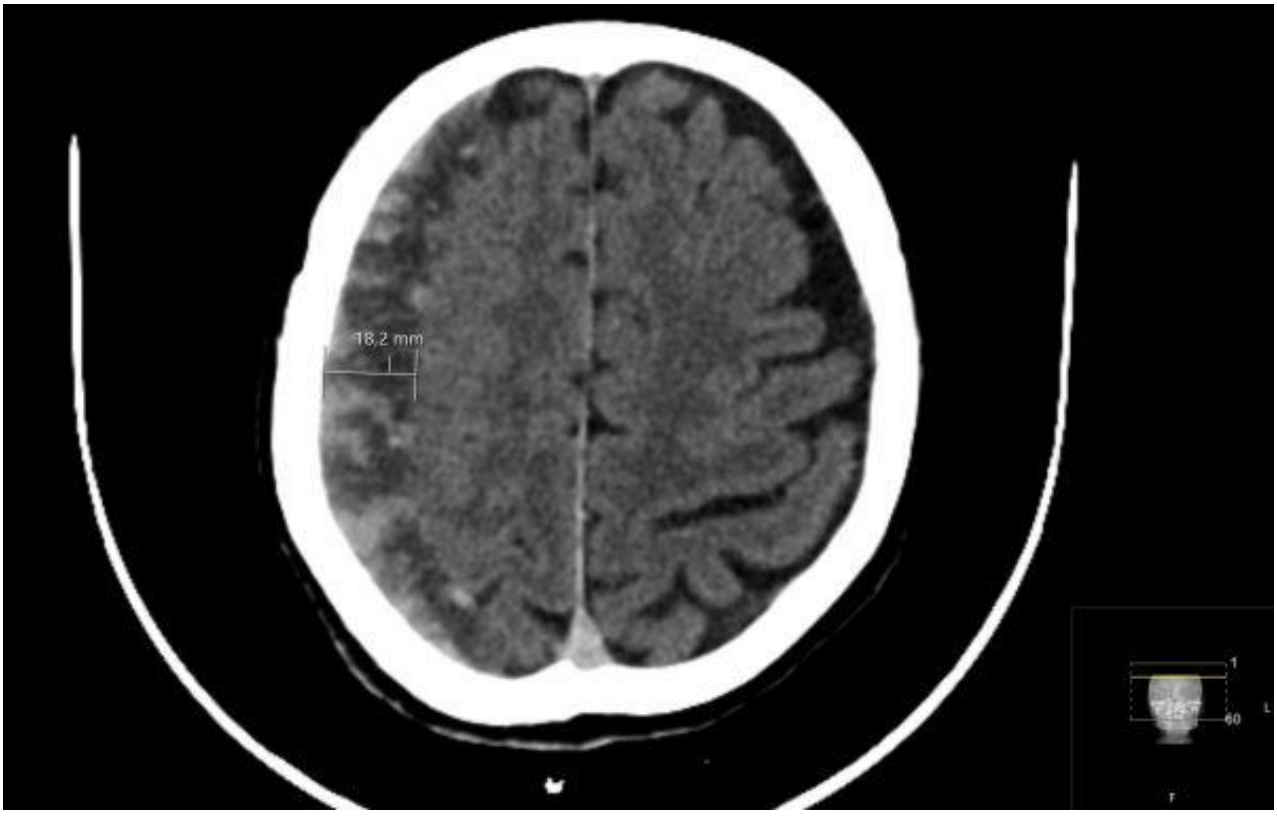
Description of the Figure: POST EMBO BRAIN CT



Description of the Figure: DSA POST EMBO



Description of the Figure: PRE EMBO BRAIN CT



Description of the Figure: DSA RIGHT ECA



Neurointerventional Radiology
SB-48

IS ANTITHROMBOTIC DRUG MEDICATION NECESSARY IN TANDEM OCCLUSION WITH CAROTID ARTERY STENTING AND MECHANICAL THROMBECTOMY?

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[1]İzmir Bozyaka Eğitim Ve Araştırma Hastanesi /izmir Şehir Hastanesi Radyoloji Abd
[2]Ege Üniversitesi Tıp Fakültesi Hastanesi Radyoloji Abd
[3]Ege Üniversitesi Tıp Fakültesi Hastanesi Nöroloji Abd

Aim: Tandem occlusion (TO) refers to complete or near-complete stenosis of the cervical internal carotid artery accompanied with intracranial large vessel occlusion. TO constitute approximately %10-20 of all cerebrovascular events (1) and respond poorly to intravenous thrombolytic therapy (2). Recent studies have found that mechanical thrombectomy (MT) is beneficial in acute stroke patients with TO (3). While there are authors who perform carotid artery stenting (CAS) with MT in the same session, balloon angioplasty, aspiration or MT only. Complexity arises in deciding on treatment because it requires the use of antithrombotic drugs, which may increase the risk of intracranial hemorrhage (ICH) after CAS (4). In our study, we investigated the necessity of drug loading by evaluating post-procedure stent occlusion and hemorrhagic conversion rates in patients with TO who underwent CAS and MT without antithrombotic drug loading.

Materials and Methods: Our study included 44 patients who presented with TO and who were followed up without antithrombotic treatment for the first 24 hours after MT and CAS. Demographic characteristics of the patients, time to admission to the emergency department, needle time with computer tomography angiography (CTA), Thrombolysis in Cerebral Infarction (TICI) score, entry and exit NIHSS scores, presence of ICH complications and stent patency were evaluated retrospectively. Clinical outcome was evaluated by mRS scores at exit and 3 months.

Results: Thirty-four patients (%77.2) were male and 10 (%22.8) were female, and the average age was 65.25. Successful recanalization (TICI 2C-3) was detected except 1 patient. Good clinical outcome (mRS ≤ 2) was achieved in 33 (%75) patients. There was no ICH in %43 of the patients in the control brain tomography(CT) at the 6th hour after the procedure. Sulcal sac was detected in %25 of the patients and parenchymal hemorrhage was detected in %32. Of these, 9 patients (%20) were symptomatic. Stent occlusion was observed in 1 of 44 patients (%0.02) on control Doppler USG or CT angiography.

Conclusion: In the multicenter TITAN study by Papanagiotou et al., administration of antithrombotic drugs was associated with a lower risk of ICH than those without, and had a high rate of intracranial recanalization (%83) whereas the same treatment without antithrombotic drugs had a higher rate of ICH (5).Many European series report utilizing an IV loading dose of acetylsalicylic acid (250-1000 mg) and then an enteric loading dose of clopidogrel (300 mg) after a postprocedural follow-up CT scan shows no evidence of hemorrhage (6).However, based on the available literature, there is no clear antiplatelet regimen that appears to be superior for patients undergoing CAS who present with TO. In our study, the rate of stent thrombosis was found to be quite low with good clinical outcomes in patients without antithrombotic loading. The optimal treatment strategy of TO further larger trials need to be performed.

Keywords : TANDEM OCCLUSION, MECHANICAL THROMBECTOMY, CAROTIS STENTING, STROKE

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Neurointerventional Radiology
SB-49

ENDOVASCULAR TREATMENT AND FOLLOW-UP RESULTS OF INTRACRANIAL ANEURYSMS WITH PERIANEURYSMAL EDEMA

BÜŞRA AK[1], CENGİZ KADIYORAN[2], OSMAN KOÇ[2]
[1]Kahramanmaraş Göksun State Hospıtal
[2]Necmettin Erbakan Unıversıty Medıcal Faculty Hospıtal

Purpose: We aimed to present the endovascular treatment and follow-up results of patients with intracranial aneurysms and vasogenic edema around the aneurysm in brain MRI examination.

Materials and Method: Between January 2010 and March 2022, 29 patients who were treated at Necmettin Erbakan University Meram Medical Faculty, Department of Radiology, Interventional Radiology Unit were included in the study. The clinical status of the patients before the procedure was evaluated with the Modified Rankin Scale. After the treatment, they were called for control in the 1st month, 6th month, first year and later years. Controls were performed with MR Angiography and DSA to evaluate aneurysm filling, while edema was monitored with Uncontrast Brain MRI.

Results: A total of 29 patients, 15 (51.7%) male, 14 (49.3%) female, aged between 31 and 83(mean 58.4) were included in the study. Aneurysm sizes ranged from 5 mm to 80 mm (partial thrombosed) (median diameter 26.03 mm). Eleven of the included patients had partial thrombosed aneurysms. SAH was detected in 5 patients at the time of diagnosis. Locations of aneurysms; 10 MCA bifurcation(%35), 5 basilar artery(%16), 4 ICA(%14), 2 ophthalmic artery(%7), 1 choroidal artery(%3.5), 1 vertebral artery(%3.5), 1 ACA-A1 junction(%3.5), 1 ACom(%3.5), 1 SSA(%3.5), 1 PICA(%3.5), 1 PCA-P2 junction(%3.5), 1 MCA M2-M3 junction(%3.5) was determined as. In addition to aneurysm, intracranial AVM was detected in 2 patients. The mean follow-up period after the procedure was 21 months, and the interval was between 1-45 months. In the long-term follow-up of the patients, Type 1 (100% occlusion) was observed according to the Modified Raymond-Roy classification in 21 patients, while Type 2 (residual neck) occlusion was observed in 4 patients. While 1 refilling aneurysm was treated with WEB and 1 aneurysm current converter, 2 patients did not come for treatment. Edema findings decreased in 19 patients compared to yhe initial MRI, remained stable in 5 patients and increased due to infarction in 1 patient. In the long term follow up, 19 patients survived as asymptomatic, while 10 patients died.

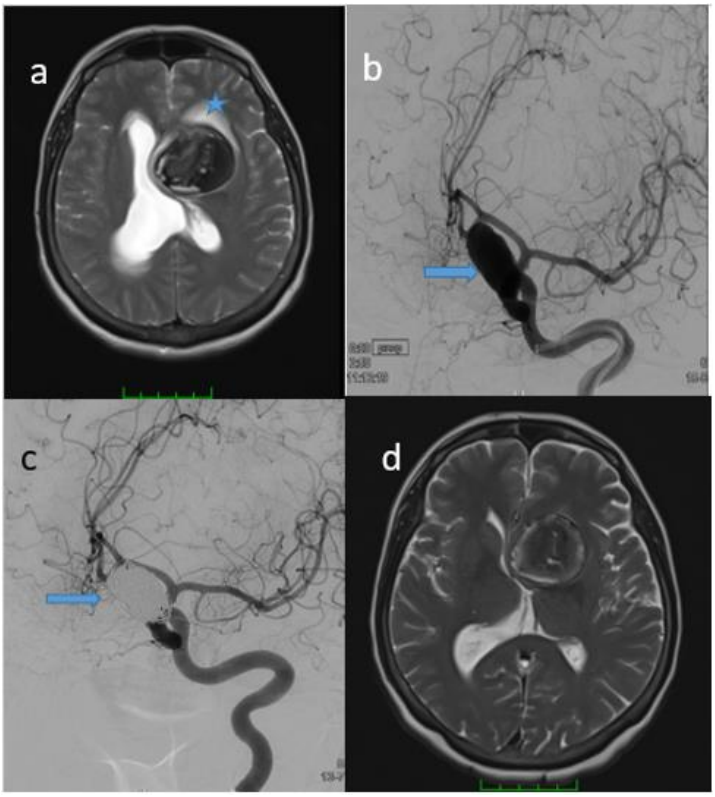
Conclusion: Although perianeurysmal edema is a rare complication of intracranial aneurysms, most of the time, patients may be asymptomatic or present with nonspecific headache, as in our study. As a result of our study, we think that large and giant aneurysms and partially thrombosed aneurysms are in the risky group in terms of edema, consistent with the literature.
Endovascular treatment both eliminates the risk of ruptures and reduces perianeurysmal edema, as we have shown in our study.

Keywords : Intracranial aneurysm, perianeurysmal edema, endovascular treatment, MR Imaging

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Figure:
Description of the Figure: A 54-year-old female patient was being investigated for headache complaints that had been going on for 1 year. In T2A series of brain MRI, an aneurysm with edema in the periphery is detected in the frontal region on the left, adjacent to the lateral ventricle. b. DSA performed on the patient shows a 30 mm diameter partial thrombosed aneurysm in the ICA ophthalmic artery segment. c. View of an aneurysm that is embolized with a coil and does not show filling d. Brain MRI obtained 29 months later shows that the perianeurysmal edema has significantly regressed.



Neurointerventional Radiology
SB-50

DIRECT CAROTID PUNCTURE IN ENDOVASCULAR TREATMENT OF ACUTE ISCHEMIC STROKE

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[1]Konya City Hospital

Purpose: Endovascular mechanical thrombectomy is an effective treatment method in the treatment of acute ischemic stroke. Although femoral access is most commonly used in treatment, access to the carotid artery is not possible in every patient due to anatomical reasons, especially in the elderly population. Direct carotid puncture is an alternative access that can be used in this group of patients. This study aims to determine the feasibility and early complications of direct carotid puncture.

Method: Patients who underwent carotid puncture for mechanical thrombectomy in the angiography unit of our hospital between 2020-2023 were included in the study. The patient results recorded in the hospital information system were evaluated retrospectively. Femoral access was first used in patients who were candidates for mechanical thrombectomy. Brachial access was tried in patients in whom access could not be obtained from the femoral artery within the 15th minute. If brachial access could not be achieved, a decision was made to perform a direct carotid puncture, and a 6F vascular sheath was placed in the main carotid artery. Then, the standard mechanical thrombectomy procedure was performed. At the end of the procedure, the vascular sheath was removed and hemostasis was achieved with compression. After hemostasis, puncture localization was checked with ultrasound and then a bandage was applied. The occluded vessel before the procedure was recorded and the degree of patency achieved after the procedure was determined by the TICI score. TICI score of 2B and above was defined as a successful thrombectomy. 24 hours after the procedure, puncture localization was re-evaluated with ultrasound, complications in the procedure area were recorded, and early complications were determined.

Results: 11 patients (7 men, 4 women) who underwent direct carotid puncture for mechanical thrombectomy were included in this study. The average age of the patients was 72 years. 5 patients were processed due to distal ICA occlusion and 6 patients due to MCA M1 segment occlusion. The procedure resulted in successful thrombectomy in a total of 7 patients, with TICI 3 in 5 patients and TICI 2B in 2 patients. Limited hematoma was observed after the procedure in 2 patients. At the 24th hour, the hematoma remained limited and there were no additional complications. In 1 patient, a growing mass was observed on the neck 3 hours after the procedure. When the ultrasound showed that the hematoma was growing, the patient was taken for angiography again. Upon detection of extravasation, extravasation was treated by placing a stent graft.There were no fatal complications related to the puncture site in any patient.

Conclusion: Despite potential complications, direct carotid puncture in the treatment of acute ischemic stroke enables endovascular therapy and may reduce the rate of poor clinical outcomes associated with delayed revascularization in cases where transfemoral access is not possible.

Keywords : Stroke, mechanical, thrombectomy, carotid, puncture

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Figure :
Description of the Figure: Carotid puncture angiography image



Description of the Figure: Carotid puncture location



Neurointerventional Radiology
SB-51

COMPARING HUMAN-WRITTEN AND AI-GENERATED ABSTRACTS IN INTERVENTIONAL NEURORADIOLOGY: ASSESSING GENUINENESS THROUGH PERPLEXITY SCORES (PPL)

Alperen Elek[1], Hatice Sude Yıldız[3], Batuhan Gündogdu[2], Nisa Cem Ören[2], Benan Akça[2]
[1]Ege University Faculty Of Medicine
[2]Chicago University Faculty Of Medicine
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Purpose: The purpose of this study is to compare human-written and AI-generated academic abstracts in various aspects and demonstrate the utility of Perplexity scores (PPL) in detecting AI-generated texts.

Methods: A set of academic articles were curated from the PubMed database that include the keywords "neuroradiology" and "angiography." The PubMed search engine was filtered to include only English-language, open-access articles with abstracts that had no subheadings, were published after 2021, and did not exceed the word limit for chatbot processing. The first 50 articles that met these criteria were selected, and their full texts (without abstracts) were used as input to generate artificial abstracts with the OpenAI's GPT-3.5 chatbot to produce abstracts with same word count as the original abstracts. The chatbot was reset after each task to avoid bias and information leakage. Then, PPL scores, which yield a metric of a large language model's (LLM) confidence in predicting the given text, were calculated with another LLM, Meta's newest model Llama 2, for both the AI-generated and the human-written abstracts to assess the involvement of generative-AI in the writing process. We compared the PPL scores of human vs. AI-generated abstracts with the Mann–Whitney U test. Moreover we used another state of the art LLM, Google's Bard, to evaluate whether it could distinguish between human-written and AI-generated texts by querying its assessment on whether the given abstract is human-written or AI-generated.

Results: Google Bard performed less than chance in identifying the author of the abstract (human vs. AI) with an accuracy of 36%. On the other hand, PPL scores of Llama 2 for human-written abstracts were higher than AI-generated abstracts written by OpenAI's GPT3.5 ($p < 0.05$)

Conclusion: Although LLMs are useful in facilitating the academic writing process, factors like the genuineness of the text and the author's effort are still in question. LLMs are often quite unsuccessful in recognizing abstracts generated by another language model. However, PPL scores can still be used to assess whether the texts are written by AI or human.

Clinical Relevance: Accurate identification of AI-generated content can ensure the credibility and reliability of medical literature (as well as radiology reports – although this was not the main focus of this study), guiding physicians in making informed decisions

Keywords : Large Language Models, ChatGpt, Google Bards, Microsoft Bing, Interventional Neuroradiology

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Neurointerventional Radiology
SB-52

THE RELATIONSHIP BETWEEN CAROTID ARTERY STENOSIS RATE AND COMPLICATIONS IN PATIENTS TREATED WITH CAROTID STENTING

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Purpose: Determining whether there is a relationship between the rate of stenosis in the carotid artery and complications

Methods: 109 patients treated with carotid artery stenting in our center were included in the study. An indication for treatment was determined as carotid artery stenosis being over 50% in symptomatic patients and over 70% in asymptomatic patients. It was evaluated whether there was a difference in terms of complications between stenoses below 90% and above 90%.

Results: There was no procedure-related mortality in any patient. Minor complications developed in 22 patients (20.2%). There was prolonged hypotension/bradycardia in 17 patients (77.3%) and transient ischemic attack in 5 patients (22.7%). Inguinal entry site complications were detected in 3 patients (2.7%). Major complications developed in 11 patients (10%). There was hyperperfusion syndrome in 5 patients (45%), microinfarcts in 5 patients (45%), and acute stent thrombosis in one patient. No significant difference was found between patients with stenosis below 90 percent and patients with stenosis above 90 percent in terms of age, gender, major and minor complications, and groin entry site complications. It was observed that the open and closed cell morphology of the selected stent did not make any difference in terms of complications.

Conclusion: The most important result of our study is that there is no significant difference in terms of complications between patients who underwent carotid stenting due to carotid stenosis below and above ninety percent.

Keywords : Carotid Stenting, Stroke, Hyperperfusion syndrome, Hypotension

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Tables:

Comparison of patients with stenosis below ninety percent and patients with stenosis above ninety percent.

	Shortness≥90% (n=47)	Shortness<90% (n=62)	
Age (Median)	67	68	0,526
Gender (M/F)	30/17	41/21	0,457
Major Complications	5 (10,6%)	6 (9,6%)	0,935
Minor Complications	9 (19,1%)	13 (21%)	0,889
Groin entry site complications	1 (2,1%)	2 (3,2%)	0,062

Neurointerventional Radiology
SB-53

INITIAL EXPERIENCE WITH LVIS EVO STENTS IN TREATING CEREBRAL ANEURYSMS

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Aim: There are a variety of intracranial stents in the market. In 2020, the low-profile visible intraluminal support (LVIS) EVO stents were officially released. The knowledge about the efficacy and safety of this device is limited due to its novelty. The purpose of the study is to report our technical and clinical experiences with the LVIS EVO stent in treating cerebral aneurysms.

Material and method: A retrospective chart review was performed to identify patients who received cerebral aneurysm treatment using the LVIS EVO stent in our centre between January 2022 and August 2023. Data collected included demographic characteristics, clinical presentation, aneurysmal details including location, size and morphology, procedural aspects, time interval between procedure and last control and clinical outcomes.

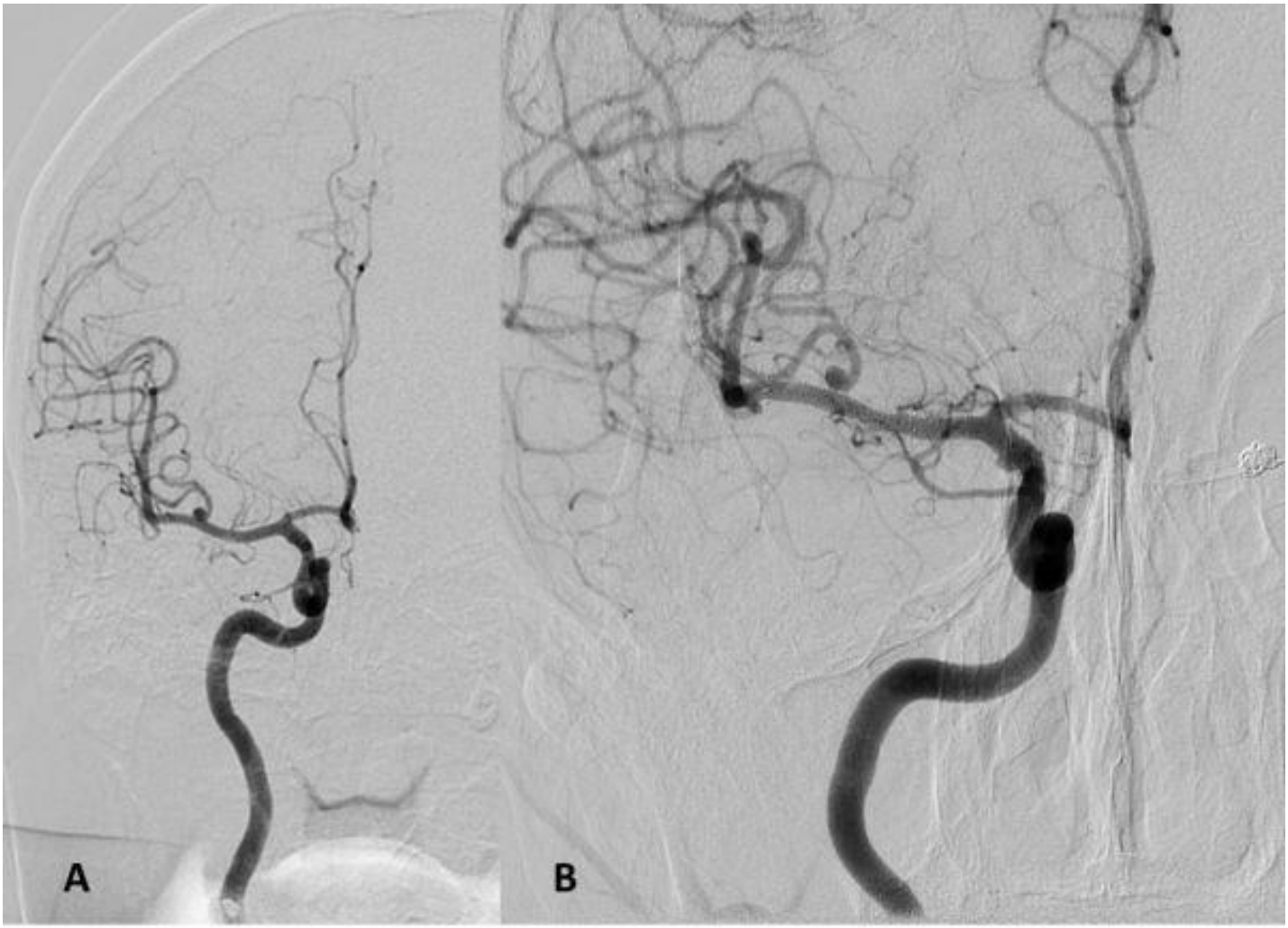
Results: In total, nine patients underwent endovascular embolization with the use of the LVIS EVO stent, including eight (88.9%) females. The mean age was 47 years (range 23–68 years). Out of nine patients, four presented with aneurysmal rupture. The aneurysm location was as follows: three basilar artery, three middle cerebral artery bifurcation, one anterior cerebral artery A2 segment and one posterior communicating artery. The mean aneurysmal size was 4,2 mm (range 1,9–10,4 mm). Two of the nine patients had dissecting aneurysms, one of which was located in the A1 segment and the other in the A2 segment. Except for four, in all patients, telescopic stenting with two stents was performed. Of these four patients, three were treated with inserting only one stent, whereas three nested stents had to be used in one patient. The mean time between the procedure and last control was 5,8 months (range 2,3–12,3 months). Out of nine patients, seven show improvement and two show none. One patient died one month after the procedure due to the complications of prior subarachnoid hemorrhage. One patient, who had a ruptured basilar tip aneurysm, experienced re-bleeding one month after the procedure, and she underwent coil embolization. In one patient, a second LVIS EVO stent was placed inside the first stent in another session due to persistence of the aneurysm.

Conclusion: The usage of LVIS EVO stents is feasible and effective in the management of cerebral aneurysms, producing acceptable results in the short to mid-term.

Keywords : Cerebral aneurysm, intracranial stent, embolization, LVIS EVO

Figure:

Description of the Figure: Digital subtraction angiography images showing the pre and postprocedural status of the right middle cerebral artery aneurysm treated with telescopic stenting (a and b). Note that the aneurysm has a stable course on the 8,6 months of the procedure.



Vascular interventional Radiology
SB-54

CATHETER-DIRECTED IONIC LIQUID EMBOLIC AGENTS FOR RAPID PORTAL VEIN EMBOLIZATION, SEGMENTECTOMY, AND BILE DUCT ABLATION

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Aim: Portal vein embolization (PVE), a procedure that induces growth of future remnant liver (FLR), is often performed before resection of primary and metastatic liver cancers. However, the embolic materials currently in use for PVE do not treat the tumor, which primarily receives its blood supply from branches of the hepatic artery, posing a risk for tumor progression during the interval between PVE and surgery. Here, we developed an ionic-liquid-based embolic material (referred to as LEAD) for embolization, liver ablation, and drug delivery from the portal vein.

Methods: LEAD was optimized and characterized for diffusivity, X-ray visibility, cytotoxicity, antibacterial effect, and injectability through microcatheter. *In vivo* analyses using a porcine portal vein embolization model were performed to examine embolization, ablation of the portal triad, and delivery of drugs. A murine cholangiocarcinoma model and *ex vivo* human tumors were used to test the ablation and drug delivery capabilities of LEAD.

Results: Survival and non-survival porcine liver embolization experiments demonstrated successful portal vein embolization leading to expected segmentectomy, ablation of surrounding tissues, and delivery of a large protein drug (i.e., Nivolumab) with LEAD. In cholangiocarcinoma mouse tumor models and in ex vivo human tumors, LEAD consistently achieved an effective ablation and wide drug distribution. Furthermore, various strains of drug-resistant patient-derived bacteria have shown significant susceptibility to LEAD, suggesting the potential of LEAD to prevent septic complications, which could be seen from tissue ablation.

Conclusion: LEAD delivery into portal veins offers a potential alternative to segmentectomy or lobectomy for tumor ablation and for FLR growth. LEAD has capabilities to embolize, ablate, and deliver therapeutics; it is also easy to use and has a high safety profile.