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Case report

Unusual radiographic images of radiopaque contrast media incidentally observed in intracranial region: two case reports

İlkay Peker,
Berrin Çelik,
Umut Pamukçu,
Özlem Üçok

The oil-based contrast medium has extremely slow clearance rate from cerebrospinal fluid. The medium known as myodil or pantopaque or iopenydylate was firstly introduced in 1944 to be used in myelography, cisternography and ventriculography. It was commonly used until 1980s but was later replaced by water-soluble mediums in 1990s because of its complication and sequelae. Although rare, images of the remnants may still be encountered on radiograms since its remnants may be seen after six decades. In this article, incidental radiopaque images in panoramic radiography and cone-beam computed tomography (CBCT) were presented in two patients whose myelography was taken before herniated discs' operation. Unusual incidental radiopacities in intracranial region were observed on panoramic radiography image of a male and CBCT image of a female, both of whom underwent myelography more than 30 years ago. Dentomaxillofacial radiologists should be aware of this radiographic appearance, should be able to differentiate it from possible pathologies.

Keywords: *Long-term adverse effect; contrast media; panoramic radiography; cone-beam computed tomography; diagnostic imaging*

Introduction

The oil-based contrast medium has extremely slow clearance rate from cerebrospinal fluid. The medium known as myodil or pantopaque or iopenydylate was firstly introduced in 1944 by Ramsey *et al.* (1) and was widely used as synchronous by Steinhausen *et al.* (2) for myelography. This oil-based contrast medium was commonly used until 1980s for myelography, cisternography and ventriculography because of its ideal physical and radiographic features (3, 4). However, the myodil was replaced by water-soluble medium in 1990s due to its several complications and sequelae such as arachnoidids, chronic irritation, arachnoid adhesions and nerve damage depending on extremely slow clearance rate from cerebrospinal fluid (5-7). The remnants of the oil-based contrast medium may be seen after six decades (8). Although rare, images of the remnants may be still encountered on skull radiograms in recent dental practice. In the literature, it has been reported that the remnants of contrast media were observed on brain computed tomography and lumbar and thoracic magnetic resonance images. However, there are limited number of published cases in conventional skull radiograms (4, 9, 10).

The aim of this article is to present two cases with intracranial oil-based contrast medium-related radioopacities incidentally discovered on panoramic radiography and cone-beam computed tomography (CBCT) who had underwent myelography for herniated discs more than 3 decades ago.

ORCID IDs of the authors: İ.P. 0000-0002-2888-2979; B.Ç. 0000-0002-3602-2354; U.P. 0000-0001-8356-8344; Ö.Ü. 0000-0003-4904-0591.

Department of Dentomaxillofacial Radiology, Gazi University, Faculty of Dentistry, Ankara, Turkey

Corresponding Author: İlkay Peker
E-mail: drilkaypeker@gmail.com

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Case reports

Case 1

An 81-year-old man was referred to our clinic for prosthetic rehabilitation. Written informed consent was obtained from the patient. Medical history revealed that he had undergone herniated disc surgery in 1979. There were no other noteworthy findings. Patient claimed that he had had an injection in the lumbar region and a radiograph had been taken before the procedure. Multiple small rounded radiopacities of the millimetric dimensions were observed in the bilateral zygomatic bone region of his panoramic radiography image (Figure 1). Panoramic image was taken by using a Orthophos XG unit (Orthophos XG, Sirona Dental Systems GmbH D-64625, Bensheim, Germany) operated at 90 kVp, 12 mA and 14 seconds exposure time. It was thought that the radiopacities may be related with myelography which was performed 38 years ago. No further examination was performed since the patient was asymptomatic.

Case 2

A 73-year-old woman was referred to our clinic for dental-implant supported prosthetic rehabilitation. Written informed consent was obtained from the patient. Medical history revealed that she had undergone herniated discs' surgery in 1982 and, also, she complained about unilateral headache in the left side and backache since then. Additionally, she was using antihypertensive and antidiabetic drugs. CBCT image were obtained before implant planning. CBCT images were obtained by using a Promax 3D unit (Planmeca Oy, Helsinki, Finland) operated at 90 kVp and 12 mA with a voxel size of 0.16 mm, exposure time of 13.8 seconds, 0.4 mm slice thickness and field of view (face); 200x170 cm. Multiple small rounded radiopacities in the millimetric dimension were observed in intracranial region including sella turcica, left temporal bone and orbita (Figure 2). She was advised to visit a neurology specialist for head and back symptoms but patient refused to do so.



Figure 1. *Multiple small rounded radiopacities (the areas with yellow-marked) on panoramic radiography image in bilateral zygomatic bone regions of case 1.*

Discussion

The remnants of oil-based contrast medium in the spine may cause numerous complications including lumbar arachnoidid, spinal cord compression, nerve damage, low-back pain, weakness in the lower limbs and sensory changes. The intracranial remnants may lead to chronic arachnoidid, headache, backache, hydrocephaly, meningitis, imbalance and vertigo (4-10). It has been explained that the slow clearance rate and prolonged presence of the remnants can cause irritation (4-10).

Myodil remnants presented in the published reports have been observed mostly in the lumbar and thoracic regions, but intracranial remnants are relatively rare (4-11). The intracranial remnants on conventional skull radiograms have been observed in only three published papers (4, 9, 10). In those reports, residual myodil has been shown on Waters' view (4), brain ventriculogram (9), and skull radiograms (10) of the male patients. According to best of our knowledge, there is no published case in panoramic radiography or CBCT. In this report, intracranial radiopacities were observed on panoramic radiography image of a male and CBCT image of a female patient, both of whom had underwent myelography more than 30 years ago.

The typical radiographic appearance of these materials is usually multiple dots or droplet-like radiopaque areas in the intracranial region. These findings may be encountered in daily practice because of prolonged presence of the remnants and may be falsely interpreted as lipomas, hemorrhages and hemangiomas on conventional radiographs, computed tomography and magnetic resonance images (11). However, it has been reported that this condition can be easily diagnosed together with patient history and the presence of radiopacities on plain radiographs or computed tomography images (11-13). In the present cases, multiple small rounded radiopacities were observed on panoramic radiography and CBCT images. Both patients were easily diagnosed based on

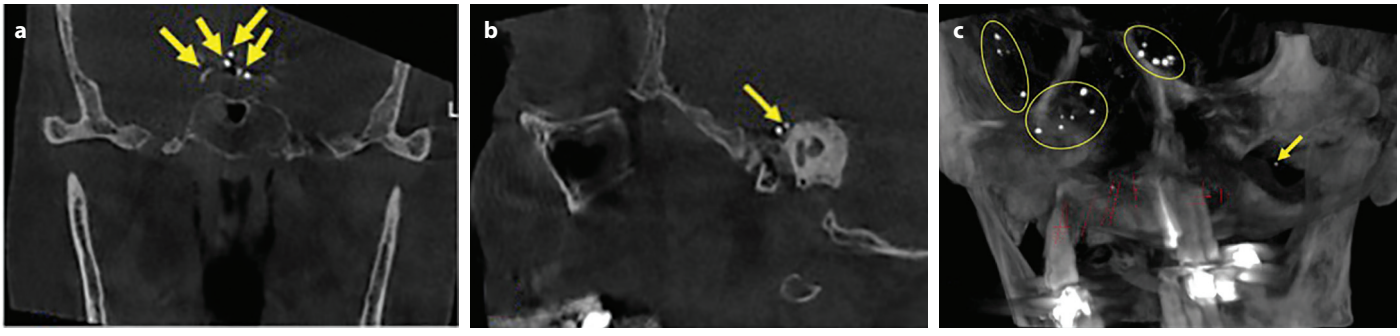


Figure 2. a-c. *Multiple small rounded radiopacities (yellow circles and arrows) can be seen in the intracranial region of case 2 (a) coronal CBCT section of sella turcica region, (b) sagittal CBCT section of left temporal bone, (c) 3-dimensional reconstruction image.*

their medical history as well as by their clinic and radiographic examinations by dentomaxillofacial radiologists.

Complications of pantopaque have been previously investigated in animal studies, clinical and case reports. Mild or severe headache, meningitis, vertigo, imbalance, arachnoidids, hydrocephalus, hypersensitivity have been reported in patients who have intracranial remnants of myodil (4, 9-11). Although some authors believed that the remnants of pantopaque in the intracranial subarachnoid space should be removed (10), symptomatic treatment and/or periodic follow-up are usually accepted approaches by several authors in minor symptomatic and/or asymptomatic cases (4, 8, 9, 14). Accordingly, in the present cases, no further examinations were carried out in the asymptomatic patient (Case 1), but the patient who complained from headache and backache (Case 2) was advised to visit a neurologist.

Conclusion

Although the use of oil-based media has been left in 1990s, its intracranial remnants on radiographic images may be still encountered in daily practice. Especially dentomaxillofacial radiologists should be aware of its radiographic appearance. The clinicians should be able to differentiate from possible pathologies by evaluating rare findings in routinely used imaging modalities.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: İP and ÖÜ designed the study. BÇ and UP generated and gathered the data. İP, BÇ, UP and ÖÜ analyzed the data. İP and ÖÜ wrote the majority of the original draft. All authors approved the final version of the paper.

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Türkçe öz: *İntrakraniyal bölgede tesadüfen izlenen nadir radyoopak kontrast madde görüntüleri: iki olgu bildirisi. Yağ-bazlı kontrast maddeler serebrospinal sıvıdan çok yavaş emilirler. Myodil, pantopaq veya iyofenidilat olarak bilinen bu maddeler ilk defa 1944 yılında miyelografi, sisternografi ve ventrikülografide kullanılması için tanımlanmıştır. Bu maddeler 1980'lere kadar yaygın olarak kullanılmıştır, fakat komplikasyonlar ve sekelleri nedeniyle 1990'larda yerini su bazlı kontrast maddelere bırakmışlardır. Nadir görülmekle birlikte, maddelerin artıklarının altı dekat sonra bile kalabilmesi nedeniyle, günümüzde hala artıkların görüntüleri ile karşılaşılabilmektedir. Bu makalede bel fıtığı operasyonu öncesi miyelografi yapılmış iki hastanın panoramik radyografi ve konik-ışınlı bilgisayarlı tomografi (KIBT) görüntülerinde tesadüfi olarak izlenen radyoopak görüntüler sunulmuştur. İntrakraniyal bölgede nadir olarak karşılaşılan bu tesadüfi bulgular, otuz yıldan fazla süre önce miyelografi yapılmış bir erkek hastanın panoramik radyografi görüntüsünde ve bir kadın hastanın KIBT görüntüsünde izlenmiştir. Dentomaksillofasiyal radyologlar bu görüntülerden haberdar olmalı ve görüntüleri olası patolojilerden ayırt edebilmelidir. Anahtar kelimeler: Uzun süreli yan etki; kontrast madde; panoramik radyografi; konik-ışınlı bilgisayarlı tomografi, diagnostik görüntüleme*

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