

Case Report

Diffusion Weighted Magnetic Resonance Imaging and Ultrasound Findings of Epidermoid Cyst in an Uncommon Location

Muammer AKYOL^a, Gulen BURAKGAZI, Tulin OZTURK

Elazığ Education and Research Hospital, Department of Radiology, Elazığ, Turkey

ABSTRACT

Epidermoid cysts are intradermal lesions that are frequently asymptomatic and can be found in any part of the body. The common sites of presentation in descending order of frequency are head, neck, trunk, extremities and the scalp. Here, we present the diffusion weighted magnetic resonance imaging (DW MRI) and ultrasound (US) findings in a 20 year-old female patient with perineal swelling, diagnosed on histological examination as a perineal epidermoid cyst. This location is rare for this type of cyst and there are limited reports, especially using the DW MRI technique.

Keywords: Epidermoid cyst, perineum, DW MRI, US

ÖZET

Nadir Bir Bölgede Görülen Epidermoid Kist Olgusunun Difüzyon Ağırlıklı Manyetik Rezonans Görüntüleme ve Ultrason Bulguları

Epidermoid kistler vücutun herhangi bir yerinde görülebilen sıklıkla asemptomatik olan intradermal lezyonlardır. Vücutta, azalan sıklık sırasına göre; baş, boyun, gövde, ekstremiteler ve skalp bölgesinde görülmektedir. Biz, perineal şişliği olan ve histolojik inceleme sonucunda epidermoid kist tanısı alan 20 yaşındaki kadın olgunun difüzyon ağırlıklı manyetik rezonans görüntüleme (DA MRG) ve ultrason (US) bulgularını sunmaktayız. Epidermoid kist perineal bölgede nadir görülmekte olup literatürde perineal bölge lezyonlarında DA MRG bulguları ile ilgili sınırlı sayıda vaka bildirilmiştir.

Anahtar Kelimeler: Epidermoid kist, perineum, DA MRG, US

Epidermoid cysts arise as a result of the intradermal proliferation of epidermal cells (1). They are often termed sebaceous cysts, epithelial cysts, epidermal inclusion cysts, keratin cysts or epidermoid inclusion cysts. They are generally small, single, asymptomatic, slow-growing lesions. Even though they may be observed in any part of the body, they arise most frequently in the head and neck or the trunk. Less commonly, they may occur in the extremities, the bones or the breast. They are rarely seen in the perineal region and only a few cases have been reported in the literature. Among the differential diagnosis of epidermoid cysts are infectious-inflammatory lesions, and benign or malignant tumors (1-3).

US, MRI and computed tomography can be used to assess the location, borders and dimensions of epidermoid cysts (2). Moreover, in the literature, there is only one case of perineal epidermoid cyst where DW MRIs revealed diffusion restriction (1). The definitive diagnosis is made by histopathological examination. Surgical excision of the lesion is frequently a curative treatment (3,4).

CASE REPORT

A 20 year-old female patient consulted the surgical outpatient clinic of our hospital with a painless perineal

swelling. She reported that the swelling had been present for several years and had increased in size in recent months. Patient history was otherwise unremarkable. Physical examination showed a subcutaneous mass on the left side of the perineal region. The patient had normal routine laboratory values and was referred to the radiology outpatient clinic for US examination. US and Doppler US showed a lesion that contains both hyperechogenic and hypoechogenic areas without vascular flow signal (Figure 1).

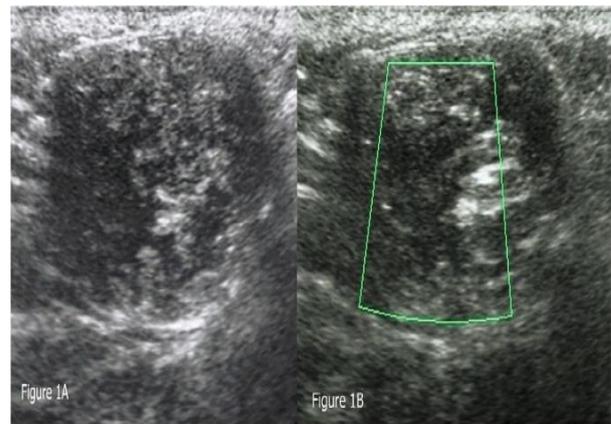


Figure 1. (A) Gray scale US shows a hypoechoic lesion with partially well-demarcated borders, containing hyperechogenic areas. (B) Doppler US do not show any vascularity

^a Yazışma Adresi: Dr. Muammer AKYOL, Elazığ Education and Research Hospital, Department of Radiology, Elazığ, Turkey
Tel: 0 424 2381000
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e-mail: muammerakyol@yahoo.com
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The patient was subjected to an MRI examination with intravenous contrast as an advanced examination. MRI revealed a smoothly marginated 28x24x21 mm subcutaneous lesion without contrast enhancement and appearing hypointense on T1 weighted images, hyperintense on T2 weighted images and hyperintense on fat-saturated T2 weighted images in the left perineal region (Figure 2). Restricted diffusion was observed on DW MRIs ($b=1000 \text{ s/mm}^2$) (Figure 3). The apparent diffusion coefficient (ADC) value was measured as $1.07 \times 10^{-3} \text{ mm}^2/\text{s}$. The tentative radiologic diagnosis was an epidermoid cyst. The lesion was surgically excised and the diagnosis confirmed by histopathological examination. The post-operative period was uneventful and the patient recovered well. Three months following the surgery, the patient was asymptomatic and there was no evidence of local recurrence. The patient was instructed to follow-up on an as-needed basis.

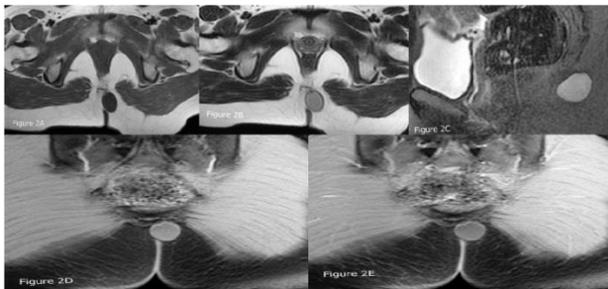


Figure 2. (A) Axial precontrast T1 weighted image reveals well-circumscribed hypointense lesion in the left perineal area. (B) Axial T2 weighted image demonstrates hyperintense lesion compared to the gluteus muscles. (C) The lesion appears hyperintense on sagittal T2 weighted fat-saturated image. (D, E) The lesion do not show contrast enhancement on coronal T1 weighted fat-saturated images without and with contrast medium.

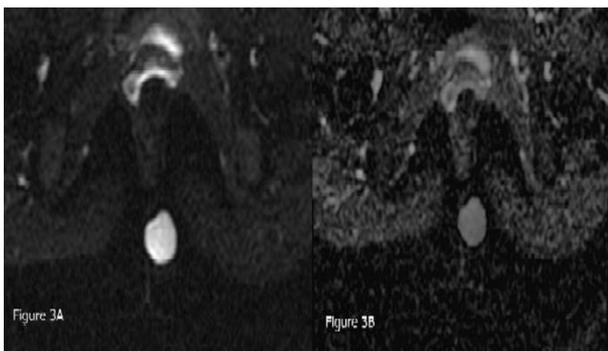


Figure 3. (A, B) Restricted diffusion is seen on DW MRIs ($b=1000 \text{ s/mm}^2$) of the lesion. The ADC value was measured as $1.07 \times 10^{-3} \text{ mm}^2/\text{s}$.

DISCUSSION

Epidermoid cysts are slow-growing benign lesions resulting from the intradermal proliferation of epidermal cells. They are approximately twice as common in men as in women. Although they can present at all ages, they are particularly frequent in the 3rd and 4th decades of life. They are usually 1-4 cm in size. However, they can reach sizes of 15 cm or larger (2,3). While the cysts are

generally asymptomatic, those that grow large and become infected or ruptured and those exhibiting malignant transformation are more likely to be symptomatic. Differential diagnosis includes abscess, cysts of the anal canal, pilonidal sinus or cyst, neurogenic tumor, lipoma, teratoma, perineal dermatitis, ganglion cyst, dermatofibrosarcoma protuberans, tailgut cyst, nodular fasciitis and myxoid tumor (3,5,6).

Although the etiology of epidermoid cysts is incompletely known, various theories have been proposed (3). One hypothesis is that during embryogenesis, an aberrant settlement of ectodermal cells occurs during the cellular differentiation process. Another theory postulates a traumatic intradermal implantation of epidermal cells, such as an injection. This theory is frequently used to explain cysts on the extremities. Another common theory proposes a dermal cystic reaction to inflammation of pilosebaceous structures. This theory is typically used to explain the presence of cysts on the face, neck and trunk. Finally, a Human Papilloma Virus 60 infection of the eccrine canals is also proposed as a mediator of epidermoid cyst development. This theory is used to explain the lesions that appear only on the palms of the hands and soles of the feet (3,7,8).

US and MRI are diagnostic means often employed to detect perineal lesions. US is useful for differentiating cystic and solid lesions. Epidermoid cysts may appear hypoechogenic, iso echogenic or hyperechogenic compared to surrounding structures on US examination. Uncomplicated cysts often have smooth walls and fail to show vascular flow signal. Nevertheless, vascular flow signals can be observed in the cyst wall of infected or inflammatory lesions. MRI is quite valuable in characterizing these lesions. Epidermoid cysts are usually hypointense on T1 weighted images and hyperintense in T2 weighted images. However, they may show different signal characteristics on both sequences. Uncomplicated lesions generally have smooth contours and do not show any enhancement or exhibit a thin peripheral enhancement after contrast agent administration. Ruptured lesions often appear septated and thick, irregular peripheral enhancement on postcontrast images due to the dermal inflammatory reaction caused by cyst contents, potentially generating an image similar to an abscess or a soft tissue tumor. Furthermore, a thick peripheral enhancement can be observed in infected/inflamed cysts and those with malignant degeneration (1,3). In the literature, restricted diffusion was reported in one case on DW MRIs of a perineal epidermoid cyst (1) as was our observation in the current case.

Definitive diagnosis of an epiermoid cyst necessitates histopathological examination. On histopathology, cysts are lined with stratified squamous epithelium that contains a granular layer and are filled

with keratinous material that is often in a laminated arrangement. Their lipid architecture is similar to that of the epidermis. In addition, they express cytokeratin 1 and 10 which are constituent of the suprabasilar layers of the epidermis (2,3). Although an epidermoid cyst is a frequently benign lesion, rarely malignant transformation can be observed. Squamous cell carcinoma, basal cell carcinoma or metastatic carcinoma may develop as a result of malignant transformation (9). The reported frequency of squamous cell carcinoma

arising from epidermal cysts ranges from 0.011 to 0.045% (10).

As a result, the present study reports the DW MRI and US findings in a rare case of perineal epidermoid cyst. We believe that DW MRI might be useful for differential diagnosis of perineal lesions and thus a study can be conducted on this purpose. Moreover, we recommend employing DW MRI in cases where intravenous contrast agent is contraindicated.

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