

TYPE-1 FRONTAL FİBROHYALİNİZE PAROSTEAL (PERIOSTEAL) LİPOMA

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ABSTRACT

Lipomas are the most common benign soft-tissue neoplasms and they account for almost 50% of all soft-tissue neoplasms. Osseous lipomas may be considered as a separate group of rare benign neoplasms affecting the bones, exhibiting either medullary, cortical or parosteal involvement. Over 150 cases of parosteal lipoma have been reported to date, accounting for 0.3% of all lipomas. We report a 24-year-old man with a parosteal lipoma located in the frontal region,

histologically surrounded by a thick fibrohyalinized rim. The differential diagnosis of this distinct type lipoma has been discussed with imaging technics, on the basis of the literature. To our knowledge, this is the second reported case of the parosteal lipoma on the frontal region and the first reported case in terms of being surrounded by a thick fibrohyalinized rim in literature.

Key Words: Periosteum, lipoma, frontal bone, gadolinium, magnetic resonance imaging *Nobel Med 2013; 9(2): 118-121*

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ÖZET

Lipomalar, en sık rastlanan iyi huylu yumuşak doku tümörleridir ve yumuşak doku tümörlerinin neredeyse %50'sini oluştururlar. Kemiği etkileyen iyi huylu tümörlerin nadir rastlanan farklı bir grubu olarak adlandırılabilir olan osseöz lipomalar ise, medüller, kortikal ya da parosteal (periosteal) yerleşimli olarak ortaya çıkarlar. Tüm lipomaların %0,3'ünü oluşturan parosteal lipomalarla ilgili, bugüne kadar 150'nin üze-

rinde olgu bildirisi yapılmıştır. Burada, frontal parosteal lipoması olan, 24 yaşında bir erkek olgu bildirilerek, histopatolojik olarak, kalın fibrohyalinize bir kılıfla çevrilmiş bu farklı tipteki lipomanın, literatür bilgileri ışığında, görüntüleme teknikleri ile ayırıcı tanısı tartışılmıştır. Bildiğimiz kadarı ile olgumuz literatürde bildirilmiş ikinci frontal parosteal lipoma olgusu olup, kalın fibrohyalinize bir kapsülle çevrili olması açısından da bildirilen ilk olgudur.

Anahtar Kelimeler: Periost, lipom, frontal kemik, gadolinyum, manyetik rezonans görüntüleme *Nobel Med 2013; 9(2): 118-121*

INTRODUCTION

The majority of soft-tissue lipomas are superficial ones. Deep lipomas are less frequently encountered and parosteal lipoma is one of the deep osseous lipomas that is located adjacent to the periosteum.¹⁻³ The original description of this condition was published by Seering in 1836 in German language. The term “parosteal lipoma” which was introduced by Power in 1888, was preferred over the previously applied “periosteal lipoma” due to its mere description of contiguity with the periosteum rather than a misleading implication of the precise tissue of origin.^{2,3} In contrast to the subcutaneous lipomas, parosteal lipomas are more commonly found in the extremities, occurring adjacent to the diaphysis or diametaphysis of the bone. They have also been encountered at the scapula, clavicle, ribs, pelvis, metacarpals, metatarsals, mandible and skull.^{1,2,4,5} Typically, lipomas are composed of only mature adipose tissue. However, other mesenchymal elements, such as smooth muscle or fibrous cartilaginous, and osseous tissue may occasionally be found.^{1-3,6,7} The causes and pathophysiologic mechanisms underlying these lesions have not been understood yet.^{2,4,7}

CASE REPORT

We present a 24-year-old male with a complaint of a 4 month duration of progressively increasing swelling on the frontal region. There were no history of trauma, and local or systemic illnesses. The findings of general clinical examination were within normal limits. On dermatologic examination, a nontender, oval, and a firm swelling was found on the frontal region. The size of the mass was 6.9x10.2 cm. There was mild erythema on the overlying skin (Figure 1a,1b). Mobility of the mass was restricted but overlying skin was slightly moved over the mass. All laboratory and biochemical parameters were within normal limits. Lateral radiogram revealed a mild periosteal reaction, and a well-circumscribed soft tissue mass containing a linear radiolucent area. The mass was attached to the cortex of the underlying frontal bone with a large base (Figure 2a). Axial computed tomography (CT) imaging showed some mild undulations and roughness anterior to the frontal bone. On the other hand, CT imaging demonstrated a linear hypodense, soft tissue which was surrounded by a mildly hyperdense thick rim (Figure 2b). Owing to these characteristics of the lesion, the mass was interpreted as a fatty tumor surrounded by a fibrous or cartilaginous thick rim. On magnetic resonance (MR) imaging, the mass was noted to be firmly attached to the periosteum of the bone. Its dimensions were 61.3x48.06x8.06 mm. Linear low-signal strands within the interior of the lesion were



Figure 1a,1b: Clinical pictures of the patient (frontal and lateral views of the mass). The erythematous and firm bulging on the frontal region

noted on T2 weighted (T2-W) images (Figure 2c,2d). The same lesion was viewed bright on the T1-W fat suppressed (T1-W-FS) images. On the other hand, there was a thick rim around the lipomatous centre. This rim was found at an intermediate-signal intensity on T2-W images. However, it was seen bright on T1-W-FS images. After the gadolinium injection in order to increase the signal intensity, intermediate signals on T1-W images of the rim and bright high-signals on T1-W images at the interior of the lesion were visualized (Figure 2e,2f). These MR findings suggested that this thick rim could be a fibrous rather than a cartilaginous tissue. After these observations, deep excisional biopsy was performed. Histological examination of the lesion revealed a mature adipose tissue enveloped in a thick hyalinized tissue with predominant dense collagenous fibrous sheaths. Additionally, there were vanishingly small number of fibrocytes. The tumor did not have any ossification or cartilaginous tissues. Based on the histomorphological and radiologic findings, a diagnosis of “type-1 parosteal fibrohyalinized lipoma” was made.

DISCUSSION

Miller et al. classified parosteal lipomas into four types according to the presence and characteristics of the associated bone reactions. Type I is comprised of parosteal lipoma that has no ossification, while Types II, III and IV referred to those with pedunculated exostosis, sessile exostosis and patchy chondro-osseous modulation, respectively.^{2,3,6} They usually present with slowly growing painless masses fixed to the underlying bones in the extremities. It is usually difficult to determine the tumor consistency. Radiographic features of a parosteal lipoma are characteristically a well-circumscribed radiolucent mass around a bony excrescence, attached to the cortex of the underlying bone.^{1,2,6} CT imaging has been shown to provide great assistance for evaluation of parosteal lipomas. Both lipomatous and osseous components of the tumor can be easily appreciated based on the characteristic CT attenuations. Both the cortical and marrow components of the bony excrescence may be demonstrated, again without →

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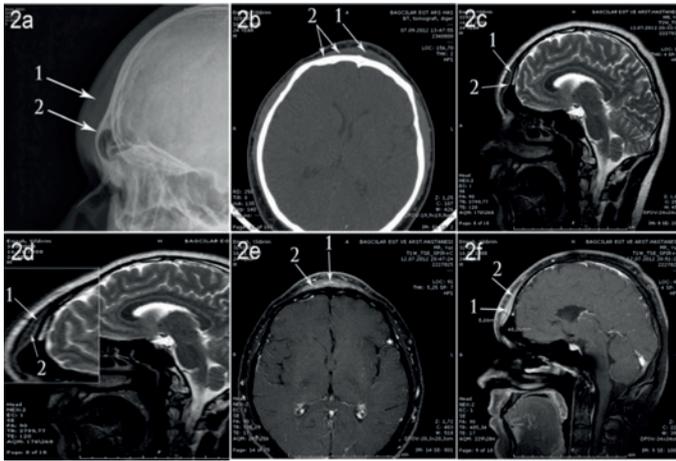


Figure 2a. Lateral craniogram: The soft tissue mass containing a linear radiolucent area (1) and a mild periosteal reaction anterior to the frontal lamina (2).

Figure 2b. Bone window on axial-CT imaging: The soft tissue mass (1), mild osseous undulations and cortical thickening (2) anterior the frontal bone.

Figure 2c. Sagittal T2W-MRI: The fusiform soft tissue mass. Intermediate-signal intensity on the rim (1) and low-signal intensity on the linear-lipomatous centre (2) of the mass.

Figure 2d. Sagittal T2W-MRI : Enlarged image of the T2W-MRI.

Figure 2e. Axial T1W-SPR+C MRI: Enhancement of signal intensity (bright, high-signals) in the lipomatous centre of the mass (1) and in the thick-fibrous rim (2), after the gadolinium injection.

Figure 2f. Sagittal T1W-SPR+C MRI: Enhancement of signal intensity (bright, high-signals) on the lipomatous centre of the mass (1) and on the fusiform-fibrous rim (2), after the gadolinium injection.

continuity with those of the underlying bone. Enhancement of the fibrous tissue component adjacent to the osseous excrescences has been described.^{1,2,5,6,8} MR imaging has been considered to be the most useful adjunct to conventional radiography in the evaluation of parosteal lipoma owing to its superb soft-tissue contrast and multiplanar imaging capability.^{1,2,5,8-11} The MR imaging features of parosteal lipoma have been described as a juxtacortical mass with a signal intensity identical to that of subcutaneous fat in all pulse sequences, including fat suppression images, with or without, osseous or periosteal changes (osseous bowing, projections, excrescences, cortical erosion, hyperostosis, undulations, periosteal reactions).^{1,2,5,8,10} Additionally in the MR imaging, appearance of fibrous tissue is variable but it is usually seen as areas of intermediate or low-signal intensity on T1-W and T2-W images.^{12,13} On the X-ray of our patient, there was a well circumscribed, radiolucent mass which has soft tissue characteristics anterior to the frontal bone and mild periosteal reaction. Axial CT imaging showed a linear hypodense centre which was surrounded by a thick mild-hyperdens rim, and slight undulations and roughness at the adjacent to the frontal bone. These findings were interpreted as a lipomatous and encapsulated soft tissue mass. On MR imaging low-signal T2-W strands and high-signal T1-W strands at the interior of the mass were found which were interpreted a lipomatous tissue. A thick rim with intermediate-signal intensity around the lipomatous

mass on T2-W images, which turned bright on T1-W-FS images was found which could represent a fibrous or cartilaginous tissue.

Cartilage and fibrous tissue are distinguishable by their different characteristic signal intensity on MR imaging. Cartilaginous tissue is visualized as areas of intermediate intensity on T1-W images and high intensity on T2-W.^{1,5,8,10} On MR imaging, appearance of fibrous tissue is variable but it's usually seen as areas of intermediate or low-signal intensity on T1-W and T2-W images. Lesions with high fibrous tissue content tend to have intermediate signal intensity.^{12,13} MRI features, enhances with gadolinium injection in parosteal lipomas.^{1,5,8,10,14} In our case, high-signal intensity at the interior of the lesion (lipomatous portion) on T1-W image was enhanced after gadolinium injection. Additionally, after gadolinium injection in order to better demonstrate the signal intensity, the thick rim of the lipoma showed an enhancement on the intermediate-signal T2-W images. The fibrous tissue can enhance brilliantly after the injection of the contrast material.¹³ However cartilaginous tissue itself does not usually become enhanced after gadolinium injection.¹ Therefore we thought this rim could represent the fibrous tissue. Additionally, there was no histologically demonstrable cartilage, but there was a significantly hyalinized tissue which had very few fibrocytes. With the all of these findings, a diagnosis of "type-1 frontal fibrohyalinized parosteal lipoma" was made.

In the differential diagnosis of parosteal lipoma; liposarcoma, osteochondroma, fibrolipoma, hibernoma and ossifying chondroid lipoma should be considered.^{2,5,7,8,14} Kransdorf et al., in an attempt to define MR imaging features that distinguish lipomas from well-differentiated liposarcoma, concluded that although a certain number of lipomas with nonadipose areas would demonstrate an imaging appearance similar to well-differentiated liposarcoma, certain features may suggest malignancy. These features include increased age, large size, thick septa, nodular and/or globular or non adipose mass-like areas and decreased percentage of fat composition.^{1,14} Panzarella et al. suggested that a false positive predictor of liposarcoma may occur with gadolinium-enhanced benign lipomatous tumors including angioliipoma, fibrolipoma, hibernoma and ossifying chondroid lipoma, owing to their increased vascularity.¹⁵ Amores-Ramirez et al. recently pointed out that parosteal lipoma should be included in such a group due to its enhancing component.^{1,10}

Although malignant potential has not been reported previously, a parosteal lipoma may easily cause paralysis or impingement syndrome because of an anatomical →

relationship of adjacent nerves. As parosteal lipomas are adherent with underlying periosteum, subperiosteal resection is mandatory in the treatment.^{2,9,16} Even though parosteal lipomas are difficult to diagnose, together with the histopathologic examination, the

characteristic radiographic appearance together with CT or certain MR imaging features should be sufficient for correct diagnosis. In this report, we tried to draw attention to this rare entity and its specific differential diagnosis with imaging techniques.



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