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CASE REPORT / OLGU SUNUMU

A Challenging Case of Locally Aggressive Polyostotic Fibrous Dysplasia

Zorlu Bir Lokal Agresif Poliostotik Fibröz Displazi Vakası

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Abstract

Fibrous dysplasia (FD) is a benign lesion observed mainly in children and young adolescents. Although benign, it can sometimes be challenging to discriminate these lesions from well-differentiated malignant tumours. Here, we describe a confusing case of asymptomatic locally aggressive polyostotic FD in a 49-year-old woman followed for a molar pregnancy. The case was particular due to the rare localization of FD in the ribs and vertebrae, and it posed a diagnostic dilemma with parosteal osteosarcoma. This case highlights the difficulty of distinguishing FD from a well-differentiated malignant tumour, especially when facing artefacts arising from the decalcification procedure.

KEY WORDS: Fibrous dysplasia, parosteal osteosarcoma, histology

Özet

Fibröz displazi (FD) çoğunlukla çocuklarda ve genç adölesanlarda görülen benign bir lezyondur. Bu lezyon benign olmasına rağmen, iyi tanımlanmış malign tümörlerle ikileme düşüren bir zorluk gösterebilir. Molar gebelik için takip edilen 49 yaşındaki bir kadında kafa karıştırıcı bir asemptomatik lokal agresif poliostotik FD vakası tanımlamaktayız. Vaka, FD'nin kaburgalar ve omurgadaki nadir lokalizasyonundan dolayı özelliklidir. Ayrıca, parosteal osteosarkom ile gizli bir tehlike yaratmaktadır. Bu vaka, özellikle dekalsifikasyon prosedürü artefaktlarıyla karşı karşıya kalındığında, FD'nin iyi tanımlanmış malign tümörden ayrımının zorluğunu vurgulamaktadır.

ANAHTAR SÖZCÜKLER: Fibröz displazi, parosteal osteosarkom, histoloji

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INTRODUCTION

Fibrous dysplasia (FD) of bone is a high-turnover bone disease defined as an osteoblastic lineage disorder caused by a post-zygotic activating mutations in the GNAS gene encoding the α-subunit of the stimulatory G-protein [1]. It is considered a developmental anomaly in which normal bone marrow is replaced by fibro-osseous tissue. Diagnosis of FD can be very challenging. This case reflects the difficulties that can be encountered when differentiating the benign lesions of FD from a well-differentiated malignant tumour. Our aim was to highlight the critical diagnostic and differential features of FD, while emphasising the need to inform the pathologist about radiologic findings before making a report of a bone tumour.

CASE REPORT

The case was a 49-year-old woman who presented with a molar pregnancy and was followed by periodic chest x-ray studies and pelvic examinations. She had no history or clinical findings suggestive of endocrine dysfunction. A computed tomography (CT) of the chest and abdomen was performed systematically and showed a costal tumour that had developed upon the right fifth rib. The tumour was heterogeneous, with a cortical rupture and many calcifications (Figure 1). No extension to the soft tissue was observed. The T1- and T2-weighted MR images revealed a hyper-intense tumour. Radiologic findings also included lytic vertebral lesions located in the sixth and seventh dorsal vertebrae. Whole-body bone scintigraphy showed high uptake of technetium-99m methylene diphosphonate by the vertebral and costal lesions. These findings were suggestive of vertebral metastases of a primary costal tumour. Management of the patient consisted of an en-bloc resection of the tumour and the sixth rib with free macroscopic margins. Gross examination revealed a tumour measuring 7 cm (Figure 2a). The routine procedure for acid decalcification of the tumour caused many artifacts and created a diagnostic challenge. Microscopic examination showed a spindle-cell and ossifying tumour that destroyed the cortex. Spindle cells were quite regular without evidence of atypia. Nodules of ossification were focally surrounded by many osteoblasts (Figure 2b). The pathologists were not informed of the radiologic findings or the presence of vertebral lesions, and the invasion of the cortex and lack of atypia led them to conclude this represented a parosteal osteosarcoma. The clinicians asked to review the diagnosis because of the absence of metastases in such a type of tumour, and a biopsy of the vertebral lesions was performed. This biopsy revealed the same features as noted in the costal lesion. Given

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Figure 1. CT scan showing a costal lesion with periosteal thickening and cortical rupture

the radiologic findings, the initial diagnosis was reviewed and the pathologists concluded this was a locally aggressive polyostotic FD. The patient has had no complications over the course of one year of follow-up.

DISCUSSION

Fibrous dysplasia is a non-inherited developmental anomaly of bone in which normal bone marrow is replaced by fibro-osseous tissue. The disease process may be localised to a single bone or multiple bones (monostotic or polyostotic FD, respectively). The latter can occur as a part of McCune-Albright syndrome (unilateral polyostotic FD, ipsilateral café-au-lait spots on the skin, and endocrine disturbances such as precocious puberty), or Mazabraud syndrome (polyostotic FD and soft-tissue myxomas) [1]. FD has also been reported in association with other endocrine dysfunctions such as hyperthyroidism, hyperparathyroidism, acromegaly, diabetes mellitus and Cushing syndrome. We describe a case of polyostotic FD in an adult woman with no signs indicating a particular syndrome. Our case reflects the difficulties in differentiating this benign lesion from a well-differentiated malignant lesion represented by parosteal osteosarcoma. In fact, the latter is an unusual slow-growing variant of osteosarcoma that occurs adjacent to the cortex of long bones. Clinical findings are insufficient to make the diagnosis, and FD is generally asymptomatic like parosteal osteosarcoma.

Parosteal osteosarcoma occurs mostly in young adults during the third decade of life with a slight female predominance. Most cases develop on the lower posterior femoral shaft, although some occur on other long bones [2]. Although rare, costal localisation of this tumour has been reported. Radiographic studies have shown a heavily mineralised mass attached to the cortex with a broad base and the tumour has a tendency to wrap around the involved bone [3]. On the other hand, FD is characterised by a thinning of the cortex without periosteal reaction, and with a matrix appearance that has been characterised as resembling "ground glass" [4]. In our case, the radiologic findings were atypical because FD has been rarely reported as a locally aggressive disease [5]. Histologic features of these two entities are in some cases very challenging. In fact, FD is generally well circumscribed and composed of fibrous and osseous components present in varying proportions. The fibrous component is composed of cytologically bland spindle cells, while the osseous component consists of irregular curvilinear trabeculae of woven bone [6]. Although benign, this entity can be locally aggressive causing cortical erosion and extension into soft tissue [5]. An important feature of parosteal osteosarcoma is the great difficulty associated with histological interpretation. The tumour does not have the conventional hallmarks of malignancy so many cases are regarded as benign or reactive lesions and may consequently result in inadequate surgical management. In our case, decalcification artefacts made identification of rimming osteoblasts difficult and the pathologists were unaware of the radiologic findings. This was presumed to be due to the concentration of the decalcifying agent, and it highlights the fact that decalcification is a challenging task in histotechnology.

To improve the differentiation between benign and malignant bone tumours, Dujardin and co-workers reported that MDM2 and CDK4 immunohistochemistry is a valuable tool in the differential diagnosis of low-grade osteosarcomas and other primary fibro-osseous lesions of the bone [7]. Lee and colleagues reported on the diagnostic utility of identifying GNAS mutations in patients with FD [8]. These findings may be helpful, but pathologists must be aware of the possibility of antigen destruction by the standard decalcification of bone tumours.

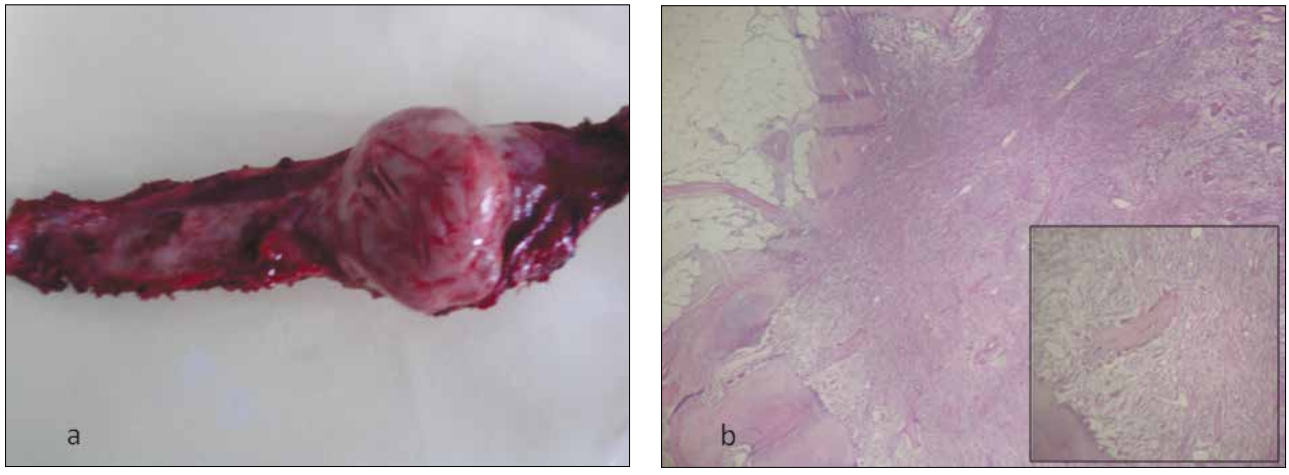


Figure 2. (a) Gross features showing a firm exophytic and polypoid bony mass. (b) Microscopic features showing a locally aggressive tumour (H&E, x250). Inset: spindle-cell and ossifying tumour destroying the cortex with artefacts of decalcification (H&E, x400)

In conclusion, although FD may be benign, it can pose a diagnostic dilemma by mimicking well-differentiated osteosarcomas. This case highlights the difficulty of routinely differentiating these tumours, and emphasises the possible artefacts introduced by decalcification. Correlation between morphologic features and radiologic findings is mandatory for accurate diagnosis.

Conflict of Interest
No conflict of interest was declared by the authors.

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