Brachial plexopathy and shoulder impairment caused by a glenoid osteochondroma

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Abstract

Osteochondroma is a very common benign tumor of the bones. We present a 51 year old right-hand dominant male with moderate pain of the shoulder, diffuse brachial plexus paresthesias and some muscle strength loosening. He also complained about lose of range of motion especially internal rotation. The patient underwent excision surgery confirming the anatomopathologic nature of the lesion. The brachial plexus was freed of compressions and the patient recovered the range of motion being asymptomatic after the postoperative period.

Introduction

Osteochondromas are the most frequent of all benign bone tumors and represent 10% to 15% of all bone tumors (1,3) Osteochondromas can be solitary or multiple, pedunculated or sessile exophytic. They grow from the bone surface and are composed of cortical and medullary bone with an overlying hyaline cartilage cap. Marrow and cortical continuity with the underlying parent bone defines the lesion (2,4,5).

Historically and currently, most osteochondromas are incidental findings and are treated solely with observation. If they remain asymptomatic, they can be ignored. Lesions that create mechanical symptoms, become painful, begin to enlarge, or cause growth disturbance have historically been treated with surgical removal, and this remains the mainstay of treatment.

The actual frequency of osteochondromas is unknown because many are not diagnosed. The male-to-female ratio is 3:1. Osteochondromas usually appear in children or adolescents between 10 and 15 years, and increase in size during childhood, ranging from 1 to 10 cm. After adolescence and skeletal maturity, osteochondromas usually exhibit no further growth (2,6). In adults, growth or imaging alterations of an osteochondroma suggest the rare diagnosis of malignant transformation; however, extensive growth of osteochondromas without histological evidence of malignancy has been reported (7,8).

Although the exact etiology of these growths is not known, a peripheral portion of the physis is thought to herniate from the growth plate (9). This herniation may be idiopathic or may be the result of trauma or a perichondrial ring deficiency. The result is an abnormal extension of metaphysic cartilage that responds to the factors that stimulate the growth plate and thus results in exostosis growth.

This island of cartilage organizes into a structure similar to the epiphysis. As this metaphysic cartilage is stimulated, enchondral bone formation occurs, developing a bony stalk. The histology of the cartilage cap reflects the classic, defined zones observed in the growth plate, namely, a zone of proliferation, columniation, hypertrophy, calcification, and ossification.

This theory is thought to explain the classic finding of the osteochondroma associated with a growth plate and growing away from the physis while maintaining its medullary continuity. The theory is also thought to explain the clinical behavior of the exostosis growing only until skeletal maturity.

Genetic karyotyping has suggested that reproducible genetic abnormalities are associated with these benign growths and that they may actually represent a true neoplastic process, not a reactive one (10,11). This research is in the early stages, and further investigation is necessary (12,13,14,15).

In this paper we describe the clinical and radiologic findings of a glenoid osteochondroma with a fast recovery after surgical excision in a worker and athletic patient.

Case Presentation

A 51 year-old male right-hand dominant patient was admitted to our hospital with painful, stiff mass which was described to be present for a few years but increased in size in the last year and became painful recently. In his history no special feature was recorded. In physical examination about 5 centimeters stiff immobile painful mass placed in the armpit was palpated. The mass seemed to be placed on
neurovascular structures of the armpit. The anteroposterior (AP) plain X-ray radiography and computed tomography (CT) revealed a bonny prominence 67x40x40 mm (cartilage cap thickness 6,5mm) in size rising from the anteroinferior of the glenoid with extension between subscapularis and teres major muscles and reported to be an osteochondroma (figure 1, 2 and 3). The mass was displacing the neurovascular structures of the brachial plexus and artery. And MRI was taken and confirmed the diagnosis not giving any other relevant information.

The range of motion was normal except for the internal rotation that was blocked passively and actively at 15 degrees. He complained increased night pain and some numbness and tingling in the arm and forearm not related to any specific nerve. In the last few months this clinical findings started to be incompatible with his work activity and sports.

The patient was scheduled for resection surgery. During the operation, through a deltopectoral approach it was observed that the lesion raised from the most inferior and anterior portion of the glenoid and grew through the surface pushing the soft tissues more anteroinferiorly. The bonny mass was excised totally as possible, after freeing it from the neurovascular braquial structures (figure 4) and pathologic examination suggested that it was an osteochondroma of 50x40x40 mm (figure 5). The incision was closed and the patient was discharged 2 days after with no portop problems. He was reinforced to use a sling for 2 weeks and to do passive range of motion exercises. The postoperative X-rays showed a normal glenoid anatomy without the tumor (figure 6).

In physical examination on the 15th day the patient was pain free and he referred an improvement in the neurological symptoms.

After six months of physical therapy the patient had recovered a normal internal rotation and was fully recovered. No radiological recurrence was noted.

No new lesion was detected to date.

Discussion

The majority of osteochondromas are asymptomatic and diagnosed incidentally. Symptomatic lesions usually occur in young population. Clinical symptoms can be related to mechanical effects, cosmetic deformity, neurovascular impingement, pseudoaneurism formation, fractures, overlying bursal formation, or malignant transformation.

Painless swelling and cosmetic deformities related to the slowly enlarging mass are the most common complaints. Spontaneous regression of skeletal osteochondromas has been reported.

Malignant transformation is the most feared sequelae of this lesions. The exact incidence of malignant transformation of solitary osteochondroma is unknown, since a number of these are asymptomatic and never diagnosed (2,18). The reported incidence is 0,4-2,2% in patients with solitary osteochondroma and up to 27,3% in patients with hereditary multiple exostoses (2). The most frequent malignancy is chondrosarcoma arising from the cap. Centrally located osteochondromas about the pelvis, hips and shoulders are particularly more prone to malignant transformation (2,8,19). The thickness of the hyaline cartilage cap is an important criterion in determining malignant transformation (2).

Clinical features suspicious for malignant transformation comprise new onset of pain in a previously stable lesion, rapid or new growth, growth after skeletal maturity and/or large lesion. (2,17).

The radiographic appearance of this tumor if often diagnostic and reflects its pathologic characteristics. Multiplanar reconstruction and three-dimensional imaging features of CT give important about determining of these lesions.

The treatment of osteochondromas in the shoulder can be conservative or surgical (excision). Stable, small asymptomatic lesions can be treated conservatively. If the lesion is painful and growing after skeletal maturity, exhibit signs of malignant transformation should be treated surgically. A marginal resection is adequate and shows a low rate of recurrence. Any remaining cartilage cap may result in recurrence, especially in growing lesions.

References

Illustrations

Illustration 1

Shoulder AP X-ray

Illustration 2

CT 3D scan
Illustration 3

CT scan

Illustration 4

Surgical procedure
Illustration 5

Tumoral mass

Illustration 6

Postoperative x-Ray