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CASE REPORT

Spontaneous Regression of Osteochondroma of the Distal Femur: A Pediatric Case Report and Literature Review

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Spontaneous regression of an osteochondroma of the distal femur is unusual. This report highlights the spontaneous regression of a sessile osteochondroma of the distal femur in a 9-year-old boy which resolved over a 4-year period. The mechanism underlying regression of the tumor is discussed with a review of previous reports. Since this type of osteochondroma can spontaneously resolve, conservative treatment is always the first choice to avoid unnecessary surgery.

Key words: Spontaneous regression, osteochondroma, self-resolution tumor, distal femur

INTRODUCTION

An osteochondroma is classified into two types, i.e., either sessile or pedunculated and usually occurs within the metaphysis typically projecting away from epiphysis.[1] Osteochondromas usually locate around the knee (50%) in which distal femur is the most common site.[2]

Osteochondroma is the most common benign bone tumor. However, spontaneous regression of an osteochondroma is extremely rare.[2] We present a case of a 9-year-old boy who complained of the anterior knee pain after trauma and was subsequently diagnosed with an osteochondroma of the distal femur that almost completely regressed within 4 years. The aim of the report is to discuss the possible mechanisms of this rare phenomenon. In addition, a review of the literature (involving 14 cases of spontaneous regression of osteochondromas of the distal femur) is also provided.

CASE REPORT

A 9-year-old boy presented with a chief complaint of occasional right anterior knee pain over 3 months after he sustained a fall. He had no specific past medical or family history and denied taking any medication. He admitted to striking his right knee on the ground with a twisting, deforming force when he fell. On physical examination, a palpable, nonmobile, nontender lump over the lateral aspect of popliteal fossa was noted. Tenderness became worse while playing sports but subsided at rest. The appearance of the knee was normal without evidence of effusion. The knee joint showed the full range of motion and good stability.

Lateral and anteroposterior radiographs [Figure 1] of the right knee showed a posterior sessile lesion within the distal femur. Although a definite pathological diagnosis was lacking, the lesion demonstrated the radiological characteristics of a solitary osteochondroma arising from the distal femur. As there were no radiological or clinical findings suggestive of malignancy (and given the lesion's close to the epiphysis), the boy was followed up and no treatment was given. Four years later, the pain had resolved clinically with full range of motion about the right knee. Repeat radiographs [Figure 2] of the entire right femur were normal. The previously demonstrated osteochondroma on the lateral aspect of the distal femur was no longer visible, confirming its spontaneous regression.

DISCUSSION

Spontaneous regression of an osteochondroma is very rare. The first case was published by Hunter in 1786 in his

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lecture series which were then published in 1835.[3] From 1960 to 2014, there have been 23 published reports of spontaneous regression of osteochondromas with confirmed radiological findings.[1,4-14] We selected 14 of those cases which involved distal femur [Table 1]. Of note, most regressions were noted before skeletal maturity except two patients. Among these 14 patients, predominantly male, the average age at the time of diagnosis was 9.7 years with the eldest being 15 years old. The observed mean duration of spontaneous regression was 3.3 years. Morphologically, nine lesions were characterized as sessile appearance and the rest five were documented as pedunculated. Thus, although there were only 14 cases in the literature of solitary osteochondromas of the distal femur that had spontaneously regressed, the majority of these lesions were sessile and occurred in young males.

Three possible mechanisms may explain the spontaneous regression of these lesions: (1) skeletal maturation is followed by the cease of osteochondroma and lesion was fused into growing metaphysis;[8] (2) bony repair and remodeling process following a fracture was associated with an interruption of blood supply; a fracture of the stalk of a pedunculated osteochondroma may have accelerated resolution of the lesion;[9] and (3) resorption of an osteochondroma occurred due to the presence of an accompanying pseudoaneurysm.[1]

Our patient was diagnosed with a sessile osteochondroma at the age of 9 that regressed spontaneously before skeletal maturity, supporting the first theory. However, our case also had a history of the previous trauma and knee contusion. Although there was no obvious fracture of the sessile lesion in the distal femur on radiographic images, a microfracture of the lesion

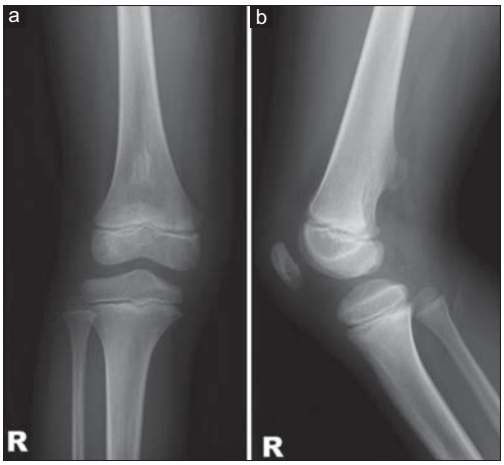

Figure 1: (a) Anteroposterior and (b) lateral radiographs of the right knee show the classic radiological findings of an osteochondroma

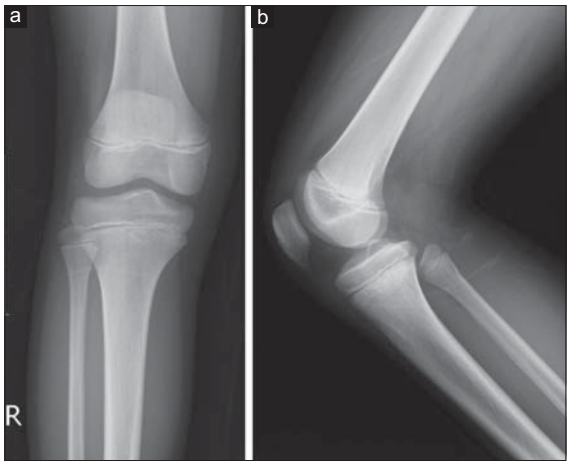

Figure 2: (a) Anteroposterior and (b) lateral radiographs of the same knee obtained 4 years after diagnosis shows resolution of the osteochondroma

Table 1: Summary of case reports about spontaneous regression of osteochondroma of distal femur

Authors	Caser number	Type	Sex	Age of diagnosis (y)	Regression time (y)	Age of regression
Passanise *et al*.[1]	1	Sessile	Male	12	4	16
Alazne Valdivielso-Ortiz[4]	1	Sessile	Female	9	4	13
Yujiro Oyama. *et al*.[5]	1	Sessile	Male	12	3	15
Deprez *et al*.[6]	1	Pedunculated	Female	11	4	15
Hill *et al*.[7]	1	Sessile	Male	6	3	9
Paling[8]	1	Pedunculated	Male	9	2.5	11.5
Copeland *et al*.[9]	2	Sessile, Pedunculated	Male	11,10	2,2	13,12
Merle *et al*.[10]	1	Sessile	Male	6	7	13
Rosa and Cianfanelli[11]	1	Sessile	Male	13	*	*
Reston *et al*.[12]	1	Pedunculated	Male	15	4	19
Choi *et al*.[13]	1	Sessile	Male	15	0.5	15.5
Arkader *et al*.[14]	1	Pedunculated	Female	12	6	18
Present case	1	Sessile	Male	9	4	13

*The original article does not provide the information about regression time and age of regression

may have affected the blood supply to the osteochondroma, supporting the second theory.

This case report demonstrates that a solitary osteochondroma of the distal femur can spontaneously regress especially if the lesion is a sessile osteochondroma in a young male. Due to this type of osteochondroma can resolve spontaneously, conservative treatment is always the first choice to avoid unnecessary surgery.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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