Compression of the External Popliteal Sciatic Nerve by an Osteochondroma of the Fibula's Head


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Abstract

Osteochondromas (OC) are the most common benign bone tumors, most commonly near the knee joint, and are generally asymptomatic, rarely causing nerve compression. A rare case of a solitary OC complicated with compression of the external popliteal sciatic nerve (SPE) is reported in the head of the fibula. The surgical excision of the tumor and neurolysis were performed, with good clinical and radiological progression, without signs of long-term recurrence.

Keywords: Osteochondroma, Fibula head, external popliteal sciatic nerve

1. Introduction

Osteochondroma (OC), also referred to as osteochondral exostosis, is the most common benign bone tumor, accounting for 10-15% of all bone tumors and about 30% of all benign bone tumors(1). Although it may appear in a context of hereditary exostosis, it most often occurs as an isolated lesion in the form of a solitary OC(2). Fibrous involvement is rare and is often diagnosed fortuitously at a later stage of complications, mainly when the tumor causes neurovascular compression leading to a deficit syndrome or malignant degeneration which is observed only in less than 1% of cases Of knee OC(3).

We report a rare case of OC of the fibula's head, compressing the SPE nerve, in a teenager with a sensory deficit in the leg and foot. We present it for its rarity, and its accessibility to early diagnosis, which remains the only way to prevent the installation of irreversible neurological lesions.

2. Case Report

This is a 14-year-old boy with no specific pathological history, with tingling on the outside of the right leg, and paresthesias in the dorsal aspect of the right foot, which has been evolving for six months Without any pain associated with it.

Clinical examination showed an ovoid swelling at the external surface of the right knee, depending on the head of the fibula, 3 cm in diameter, of hard consistency, mobile with respect to the superficial plane and fixed with respect to the Deep plan. Without inflammatory signs. The neurological examination showed a sign of tinel (+), and a sensory deficit in the territory of the SPE nerve, with no sign of associated motor deficit.

The standard radiography of the knee face and profile showed an opacity in the head of the fibula, in metaphyso-diaphyseal juxta-cortical, in the form of a clear ovoid geode with sharp contours, evoking its cartilaginous nature (Fig :1). On the other hand, there were no associated bone lesions, and the adjacent soft tissues were normal.

The MRI evoked the cartilaginous nature of the lesion, specifying its intimate relationship with the SPE nerve that was compressed. The tumor is hypo-signal in T1 and hyper-signal in T2, the rest of the examination is normal (Fig : 2,3).

The surgery revealed a very limited cartilaginous tumor adherent to the nerve SPE (Fig 4). We performed neurolysis of the SPE nerve (Fig 5) around the fibula's head and excision (Fig 6) of the mass curettage which was sent to the pathologic examination and confirmed the diagnosis of an OC without signs of malignancy.

The sequences were favorable, a control EMG was done in the third postoperative month, it showed a complete disappearance of the neurological lesions. At the last follow-up, and at the two-year follow-up, there was no recurrence of the tumor, and the patient resumed his daily activities without symptoms.

Fig. 1 : Radiological image showing an opacity of cartilaginous nature of the head of the fibula

Fig. 2&3 : Image by magnetic raissonnance showing compression of the sciatic nerve popliteal external

Fig. 4 : Image in peroperative showing the tumor adherent to the external popliteal sciatic nerve
OC is a benign bone tumor caused by endochondral ossification of an underlying abnormal cartilage island\(^{(1,2)}\). Its localization at the level of the fibula's head, compressing the nerve SPE is very rare, and is not reported in the English literature to our knowledge\(^{(3)}\). The age of predilection of this lesion is distributed over the first three decades with a peak at 20 years. There is a slight male predominance\(^{(5)}\).

The etiology of this lesion is not well known, many hypotheses have been postulated to explain the development of a solitary OC which can be the consequence of repeated trauma that induce metaplasia of the extra-synovial mesenchymal cells\(^{(6)}\). This leads to abnormal intimate relationships between the proximal fibula and the SPE nerve. These can be the direct consequence of accumulated squatting, regular wearing of high boots, iatrogenic injury during surgery (knee arthroplasty, high tibial osteotomy), pneumatic compression of the knee in a vicious position during sleep or The coma\(^{(7,8)}\). In addition, several cases of OC formed by surgical transplantation of growth plate cartilage during epiphysiodeses were noted\(^{(1)}\).

The OC is often asymptomatic. For this reason, its true frequency is underestimated, its accidental discovery on standard radiographs performed for another indication is estimated at 1 to 2% of the patients\(^{(5,9)}\) and in 9% of patients Exostoses involving the head of the fibula\(^{(10)}\). Symptomatic forms may be related to sudden increase in size, fracture, vasculo-nervous compression, pseudo-aneurysm formation, orthopedic deformation following compression of an adjacent growing bone\(^{(11)}\). Or a possible sarcomatous transformation. Clinically, OCs are in the form of a hard and painless bony swelling of the fibula's head. A sensory or motor neurological symptomatology must evoke compression of the SPE nerve by mass effect\(^{(12,13)}\).

Chondrosarcoma\(^{(5,10)}\), which is exceptional for osteochondroma in its solitary form, is thought to be painful, increased in volume of swelling, and a limitation of movement. This risk is estimated to be only 5 to 10% of cases\(^{(5,14)}\), and is of interest only to OCs on mature bone. Our patient was symptomatic, and presented a sensory neurological deficit, without associated pain, probably because of the unusual location of his OC compressing the SPE nerve.

On standard radiography, this tumor may be sessile or pediculate, originating perpendicularly to the metaphysis and leading to the diaphysis of the supporting bone; The cortex and the spongy bone of the OC and the adjacent bone are in continuity, its cartilaginous cap is visible only when it is calcified\(^{(5)}\).

The clinico-radiological diagnosis of CB is not uncertain, and the use of sectional imaging is a decisive contribution. Thus, MRI will be designed primarily for complex anatomical areas and is only performed when SPE nerve compression or degeneration is suspected\(^{(15)}\).

EMG may help to localize the lesion and distinguish SPE nerve trapping, sciatic neuropathy or L5 radiculopathy\(^{(16)}\).
Therapeutic abstention is the rule in typical asymptomatic 
OC, the slightest suspicion of malignant transformation should lead to surgical biopsy. On the other hand, symptomatic forms, forms compressing adjacent vital structures (nerves, arteries, joints), rapidly growing forms, or those associated with an unacceptable aesthetic deformation of the limb, localization that leads to\(^{(17)}\), this excision and the extent of the lesion may take different forms, ranging from a simple curettage to a true osteotomy, followed or not by the implantation. Place of the spongy graft, and osteosynthesis material essentially of the screwed plates.

We decided to operate our patient who presented with a FO head of the fibula, compressing the SPE nerve causing symptomatology affecting its daily life, before these nerve lesions became irreversible.

The lesion was approached directly as a function of the imaging, the SPE nerve was released, and a curettage of the entire exostosant mass was performed without filling by the cancellous bone graft.

In the long term, follow-up was necessary up to skeletal maturity to detect the two most severe complications, namely, tumor recurrence noted in 30% of cases in the literature, or malignant chondrosarcoma degeneration noted in 5 to 10% of cases\(^{(15)}\).

4. CONCLUSION

OC is a benign bone lesion of easy radio-clinical diagnosis. Clinicians need to be aware of this rare entity of the head of the fibula, compressing the nerve SPE. The tumor is generally asymptomatic until it compresses the adjacent neurovascular structure or when it undergoes malignant degeneration. Its diagnosis and its early therapeutic management, before the installation of the irreversible neurological lesions, allow a favorable functional prognosis after the surgical decompression.

Therapeutic abstention is the rule in asymptomatic forms; conversely, atypical forms must benefit from an anatomopathological study of the excision workpiece, which is necessary in view of the very small but real risk of A sarcomatous transformation.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES
