



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Deep peroneal nerve palsy due to osteochondroma arising from fibular head and proximal lateral tibia

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ARTICLE INFO

Article history:

Received 10 January 2017

Received in revised form 18 January 2017

Accepted 19 January 2017

Available online 24 January 2017

Keywords:

Peroneal nerve
Osteochondroma
Fibular head

ABSTRACT

Following median and ulnar nerves, peroneal nerve entrapment is the most frequent nerve involvement in the body Katirji and Wilbourn (1998) [1].

Osteochondromas are the most common benign bone tumors comprising 9% of all bone tumors and 35% of benign bone tumors Porter (2000) [2].

Hereditary exostoses (HME) is an autosomal dominant disorder with variable penetrance characterized by multiple osteochondromas near joints. It is one of the most common skeletal dysplasias with a frequency of about 1.18%.

In this study, we aimed to present a case with a drop foot resulting from osteochondromas of proximal tibia and fibula and help to guide the clinicians in differential diagnosis according to SCARE criteria Agha (2016) [3].

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1. Introduction

Osteochondromas are a relatively common imaging finding, accounting for 10–15% of all bone tumours and 35% of all benign bone tumours [2] 5. Although usually thought of as a benign bone tumour, they may be thought of as a developmental anomaly. They are frequently asymptomatic and have very low malignant potential if sporadic and solitary. We aimed to present a case with a drop foot resulting from osteochondromas of proximal tibia and fibula and help to guide the clinicians in differential diagnosis according to SCARE criteria Agha(2016) [3].

2. Case report

A 13 year old male patient attended our orthopaedic department and traumatology as an outpatient with complaints of difficulty in walking, lifting his right foot for the last 6 months, and painful hard lumps on the medial side of proximal tibia and distal thigh.

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<http://dx.doi.org/10.1016/j.ijscr.2017.01.050>

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On physical examination, there were multiple hard lumps around both the knee joints, proximal humerus, and on the left distal ulna and radius. There were mild valgus deformities of both the right and left ankle joints and growth disturbance of left forearm with deformity. His neurological examination revealed 1/5 tibialis anterior, 0/5 extensor digitorum longus, and 0/5 extensor hallucis longus muscle power—according to the manual muscle testing grading system. Sensation was not improved. Peroneal muscle power was 5/5. Electrophysiological study confirmed denervation of the nerve muscle supplied by the deep peroneal.

Roentgenographic evaluation revealed multiple bony exostoses arising from the proximal end of both tibia and fibula, distal femur, proximal humerus, and the left forearm. The

diagnosis was consistent with hereditary multiple osteochondromas and deep peroneal nerve palsy due to compression of the osteochondromas at the proximal tibia and fibula.

Extraction of the two osteochondromas originating from right proximal fibula and one osteochondroma from right proximal tibia was done with peroneal nerve neurolysis (Figs. 1 and 2)

Also, symptomatic osteochondromas originating from medial side of right distal femur and right proximal tibia were also removed.

Pathologic specimen depicted osteochondromas.

Tibialis anterior muscle power returned to 4/5, extensor digitorum longus muscle 3/5 and extensor hallucis longus to 2/5, 48 h



Fig. 1. Peroneal nerve looks edematous and inflamed with tibial osteochondroma at the level of fibular neck.

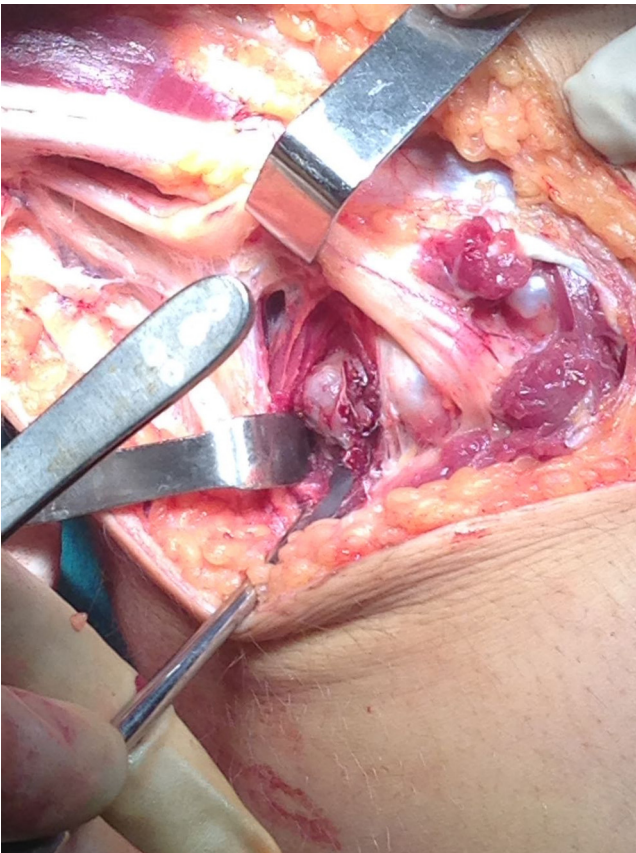


Fig. 2. Two fibular and one tibial osteochondroma compressing peroneal nerve.

after surgery. Patient is under follow-up and a physical training program.

Six weeks have passed since operation. As clinical improvement is observed, control EMG has been planned at third month postoperatively.

3. Discussion

Peroneal nerve is located behind the bony prominence of the fibular neck. It is covered primarily by subcutaneous tissue and skin. This superficial anatomical course makes the nerve extremely susceptible to injury [1,4,5].

Common causes of damage to peroneal nerve include the following: Blunt trauma to the knee, fracture of the neck of the fibula, use of tight plaster cast, prolonged squatting, regularly wearing high boots, iatrogenic injury during surgery (knee arthroplasty, high tibial osteotomy), pneumatic compression, and pressure to the knee from position during sleep or coma [6,7].

Multiple hereditary osteochondroma, also known as multiple hereditary exostosis, is an inherited skeletal dysplasia with an autosomal dominant pattern mainly affecting the epiphysis of long bones [8].

About 40 percent of the cases are sporadic [2].

Those patients have skeletal deformities and short stature clinically. The lesions are radiologically and are histopathologically similar to solitary osteochondromas. Severe HMO may lead to major spinal deformities and scoliosis [9].

These patients, however, have a risk for malignant transformation—5–10% [10].

Deformities occur due to disorganized endochondral ossification in the growth plate and may require surgical correction [11].

Disease affecting the knee joint has been described in 94% of all cases [12]. Nerve compression caused by osteochondroma is extremely rare and present in only ≤ 1 of all cases [13]. Osteochondromas are composed of osseous tissue, which is surrounded by a cap of cartilage. These lesions may be solitary or multiple, as in hereditary multiple osteochondromas.

These lesions may compress the nerve—especially in the fibular neck area—and cause total peroneal palsy or isolated deep peroneal nerve, as in our case [14]. Although there are few case reports of common peroneal nerve palsy due to proximal fibular osteochondromas in the literature in English, this case is unique because of an isolated deep peroneal nerve palsy due to osteochondroma of proximal fibula and tibia.

Neurological improvement may be achieved if surgery is performed before nerve damage becomes irreversible.

Electrophysiological tests can help to localize the lesions along the course of the nerve and can help to distinguish entrapment of the peroneal nerve from sciatic neuropathy or L5 radiculopathy [15–17].

If we do not operate the patient, nerve damage may become irreversible and involvement of superficial peroneal nerve besides deep peroneal nerve may ensue.

4. Conclusion

Most peroneal nerve trauma or compression due to mass occurs at the fibular head-neck area, where the common peroneal nerve has not yet divided into its deep and superficial peroneal branches; thus most nerve lesions involve both branches, although isolated cases as in our report may occur. Clinicians dealing with drop foot etiology should be aware of the possible mass tumoral lesions, such as osteochondromas and synovial cysts, compressing the peroneal nerve [18,19].

Conflict of interest

None.

Funding

There is no source of funding.

Ethical approval

It is retrospective case report and no necessary ethical approval.

Consent

Written consent was provided from patient for the publication of this case report.

Contributions

MD and KO conceived of the study and participated in its coordination. BK, MA, AA, FUO contributed to the acquisition of clinical data, its analysis and interpretation and to the preparation of images. KO, FUO carried out the literature review. MD, BK contributed to the preparation of the manuscript. MA, AA, contributed to the refinement of the case report. All authors have approved the final article.

Guarantor

Murat Demiroglu, Korhan Ozkan.

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