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Case Report

Bilateral compressive neuropathy of the common peroneal nerve, secondary to multiple hereditary exostosis in an adolescent patient: a case report

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ABSTRACT

Osteochondroma is the most common bone tumor, accounting for 10-15% of all skeletal tumors and 20-50% of benign ones. These lesions can compress adjacent neurological structures, causing pain, paraesthesia, claudication, and progressive deficit. Common peroneal nerve (CPN) neuropathy is the third most frequent peripheral neuropathy in the lower extremity. Chronic nerve compression can lead to progressive symptoms and permanent neurological deficits if left untreated. Early diagnosis and proper follow-up are crucial. We present the case of a 16-year-old Mexican adolescent with compressive neuropathy of the common peroneal nerve secondary to multiple exostoses. The patient experienced tingling in both legs and dorsum of the feet, and progressive difficulty in dorsiflexion of the right foot. Physical examination revealed bilateral weakness in dorsiflexion, foot eversion, and hallux extension, as well as sensory alteration on the lateral aspect of both legs and dorsum of the feet. Electromyography confirmed decreased nerve conduction velocity in both common peroneal nerves. Surgical treatment with bilateral decompression of the common peroneal nerve and resection of the bony masses was decided. After three months of follow-up, the patient showed improvement in muscle strength and recovery of sensation. Timely surgical resection allows for functional recovery and avoids permanent sequelae. In patients with bilateral symptoms, early evaluation and treatment are critical to preserve motor function and improve quality of life.

Keywords: Osteochondroma, Common peroneal nerve, Chronic nerve compression, Neurological deficits, Diagnosis, Compressive neuropathy of the common peroneal nerve, Multiple exostoses, Electromyography, Surgical treatment

INTRODUCTION

Osteochondroma is the most common bone tumor, accounting for 10-15% of all skeletal tumors and 20-50% of benign tumors. It may present as a solitary osteochondroma (85%) or as multiple tumors in multiple hereditary exostosis (MHE) (15%).[1] Lesions are characterized by being exotic, sessile, or pediculate masses covered with a cartilaginous cap that grow from the metaphysis and/or growth cartilage. These lesions appear shortly after birth and continue to grow during infancy, reaching skeletal maturity.[2] Most are asymptomatic and usually found incidentally. However, they can cause compression of the surrounding neurological structures, causing pain, paraesthesia, claudication, and progressive deficit.[1,2] Nerve compression is considered a severe and rare complication, especially in the pediatric population, with few reports found in the bibliography.[3] Common peroneal nerve neuropathy (CPN) is the most common peripheral neuropathy of the lower limb and the third most common throughout the body. It is only surpassed by the involvement of the median and ulnar nerves. Compressive disease is the most common cause, especially in the absence of a traumatic history; it can be identified along the entire course of the nerve, from its division of the sciatic nerve to its termination in the ankle and foot, being the most frequent site at the level of the head and neck of the fibula, since in this site the nerve is laid out superficially, covered only by subcutaneous tissue and fat.[4,5] Clinically, it is manifested by weakness in the dorsiflexion of the foot (fallen foot), sensory alterations in the side face of the leg and the back of the foot, as well as pain located in the region of the fibula. In the context of an osteochondroma, chronic nerve compression can lead to progressive symptoms that, if not treated properly, may result in permanent neurological deficits. This underlines the importance of early diagnosis and proper follow-up in patients with critically located osteochondromas.[6] In this paper, we present the case of a 16-year-old male patient with sensory alterations in both legs and weakness for dorsiflexion, who required surgical treatment and medical follow-up.

CASE REPORT

A 16-year-old Mexican male, weighing 61 kg and 1.60 m in height, with no chronic diseases or allergies. No history of trauma, previous infections, or neuromuscular diseases. The patient participates in soccer and swimming recreationally, with no history of previous injuries. He went to a medical evaluation for a clinical picture of 6 months of evolution, characterized by sensation of tingling in the side of both legs and the back of the feet, as well as progressive difficulty with dorsiflexion of the right foot. Physical examination revealed weakness in bilateral dorsiflexion (grade 3/5 MRC) in the right foot, 4/5 left foot), as well as for eversion of the foot (bilateral MRC 4/5) and extension of the hallux (MRC 3/5 right, 4/5 left). Sensory alteration was identified in the lateral face of both legs and the dorsum of the feet, with intermittent paresthesias, and a positive Tinel sign at the level of the head of the fibula in both legs. No signs of muscle atrophy or fasciculation were identified.

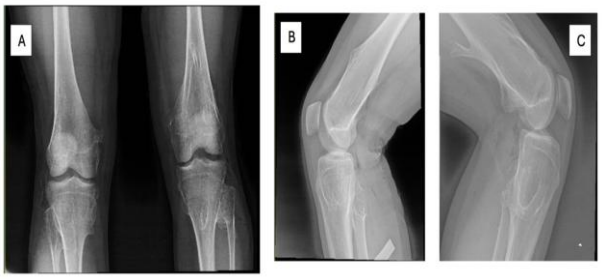

Figure 1: AP (A) and lateral right knee (B) and left (C) X-rays. Multiple exotic masses are observed in the distal third of the femur and the proximal third of the tibia and fibula on both legs.

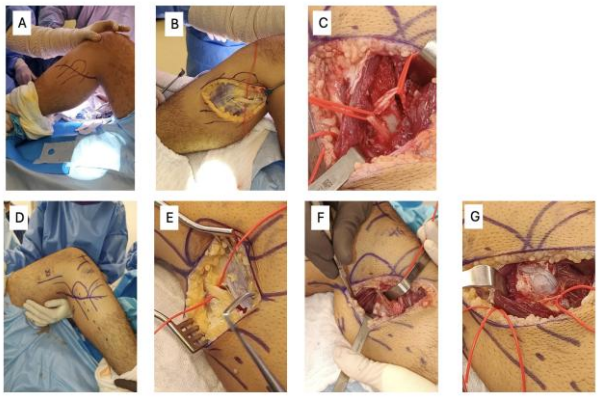

Figure 2: Decompression of the common peroneal nerve in the right (A-C) and left (D-F) legs. An incision was performed on the lesion site at the level of the fibula head (A and D), the common fibular nerve (B and E) was located, and the underlying osteochondroma (C, F, G) was removed.

As part of the diagnostic protocol, X-rays of both knees in anteroposterior and lateral projection were requested (Figure 1), as well as electromyography of the lower limbs. The radiographs showed multiple exogenous masses at the level of the distal third of the femur, proximal third of the tibia, and fibula head. Electromyography reported a significant decrease in nerve conduction speed in both common peroneal nerves, with increased distal latency and reduced amplitude of motor action potentials. The diagnosis of common peroneal nerve compressive neuropathy secondary to multiple exostoses was integrated, and surgical treatment was decided to prevent the progression of the neurological deficit. During the surgical procedure, a detailed examination and bilateral decompression of the common peroneal nerve were performed. Careful resection of the bone masses and epineurolysis of the common peroneal nerve were performed to release any residual perineural adhesion and optimize functional recovery of the nerve (Figure 2). Bone

samples obtained (Figure 3) were sent for histopathological study, confirming the diagnosis of osteochondromas, without evidence of malignant transformation.

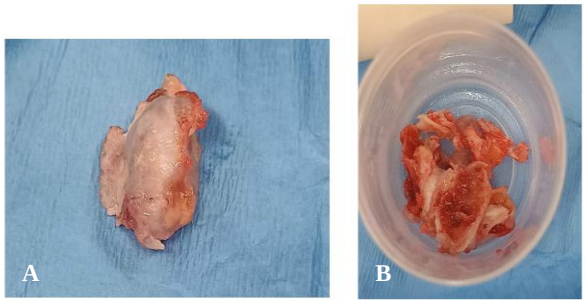

Figure 3 (A & B): Resected bone masses.

The patient was kept in post-surgical surveillance for 24 hours using analgesia and cryotherapy, and evolving appropriately. Passive mobility exercises of the knee, ankle, and fingers were started immediately, and the hospital discharge was indicated with active-assisted mobility without load, as well as isometric quadriceps exercises. Active mobility and gait rehabilitation with progressive support were initiated within 2 weeks of surgery. In the three-month follow-up after surgery, the patient presented improvement of muscle strength, with recovery of sensitivity in both legs, with residual paraesthesia in the back of the left foot. The patient continued with electrostimulation therapy and progressive muscle strengthening exercises for the anterior tibial, fibula, and plantar flexors of the foot, observing complete neurological recovery at 6 months after surgery.

DISCUSSION

Osteochondroma is the most common benign bone tumor and, although it is generally asymptomatic, can cause complications, especially with large lesions or those localized in critical anatomical sites. Skeletal complications such as deformity, joint dysfunction, fractures, and malignant degeneration are the most common; nerve compression is extremely rare and occurs in less than 1% of cases.[7]

Among the few cases of neuropathy secondary to osteochondroma reported in the literature, a study in 2014 reported that the most commonly affected nerves were the peroneal nerve and the tibial, followed by the radial nerve.[8] The most common age of presentation is the first two decades of life, and male predominance has been reported.[7]

Compression neuropathy of the common peroneal nerve (CPN) is a rare manifestation, especially in children and adolescents.[9] CPN has an anatomical predisposition to entrapment at the level of the head of the fibula, because in this area the nerve has a superficial path, covered only by subcutaneous tissue and fat. On the other hand, the muscle fibers of the long fibula and its corresponding fascia form, together with the fibula head, an osteofibrotic tunnel that represses a potential site of entrapment.[10] Motor deficits are more common than sensory deficits, this is due to the arrangement of fascicles within the CPN, with medially located motor fascicles and more laterally sensitive ones.[6] In our case, the patient presented with mixed neurological deficit probably due to the large size of the exostosis, its location and the low elasticity of the fascia of the lateral compartment of the leg, which caused severe compression of the nerve.

Surgical treatment with osteochondroma resection is the choice in patients with progressive symptoms or significant neurological deficits. Surgery allows direct nerve decompression and prevents permanent functional deterioration. The surgical technique should include careful resection to avoid damage to the growth cartilage in pediatric patients.[11] Cardelia et al reported 6 patients diagnosed with osteochondroma in the fibula head associated with paralysis of the common fibular nerve; the patients were treated with surgical excision between 0.5 and 24 months after the onset of symptoms, with 4 patients showing complete improvement and 2 partial.[12]

A more recent study by Birch et al that included 25 patients undergoing excision of osteochondromas on the fibula head at an average age of 12.4 years, reported 23 patients (92%) with complete or near-complete neurological recovery within a year of surgery, including those with significant preoperative deficit.[13] In this same study, early intervention was suggested (<3 months from onset of symptoms); however, it has also been reported in the literature that children with peripheral neurological injury show a higher nerve regeneration compared to adults, due to a greater intrinsic ability of nerve regeneration, a shorter distance for reinnervating the muscle and superior neuronal plasticity.[9,14] Therefore, although the surgery should ideally be performed within three months of the onset of symptoms, it is important to repeat it early after diagnosis in cases of long evolution, such as our patient, who, despite having 6 months of progression, achieved complete neurological recovery.

Postoperative rehabilitation is crucial for optimal functional recovery. Therefore, early-onset protocols should be favored that focus on improving mobility ranges and muscle strengthening.[10] A study conducted by Shah et al reported that postsurgical physiotherapy prevents muscular atrophy and preserves mobility of the ankle.[15]

Long-term follow-up is essential to assess neuromuscular recovery and detect possible recurrences of bone injury. In this case, the favorable patient evolution highlighted the importance of early diagnosis, appropriate surgical intervention, and a well-structured rehabilitation protocol to ensure restoration of functionality and improve quality of life.

CONCLUSION

Osteochondroma can cause a compressive neuropathy of the peroneal nerve, causing a drooping foot and sensory alterations. Timely surgical resection allows functional recovery and avoids permanent sequelae. In patients with bilateral symptoms, early assessment and appropriate treatment are critical to preserving motor function and improving quality of life.

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REFERENCES

1. Muthusamy S, Conway SA, Temple HT. Five polyostotic conditions that general orthopedic surgeons should recognize (or should not miss). Orthoped Clin North Am. 2014;45(3):417–29.
2. Payne R, Sieg E, Fox E, Harbaugh K, Rizk E. Management of nerve compression in multiple hereditary exostoses: a report of two cases and review of the literature. Child's Nervous System: ChNS: Official J Int Soc Ped Neurosurg. 2016;32(12):2453–8.
3. Leveille CF, Zhu XM, Chen J, Burrow SR, Wang Y, Tarnopolsky M, Barkho JO. Pediatric Peroneal Nerve Palsy Secondary to Fibular Osteochondroma. J Am Acad Orthop Surg. 2023;7(10):231.
4. Cherrad T, Bennani M, Zejjari H, Louaste J, Amhajji L. Peroneal Nerve Palsy due to Bulky Osteochondroma from the Fibular Head: A Rare Case and Literature Review. Case Rep Orthoped. 2020;2020:8825708.4
5. Poage C, Roth C, Scott B. Peroneal Nerve Palsy: Evaluation and Management. J Am Acad Orthop Surg. 2016;24(1):1–10.
6. Çınar A, Yumrukçal F, Salduz A, Dirik Y, Eralp L. A rare cause of 'drop foot' in the pediatric age group: Proximal fibular osteochondroma, a report of 5 cases. Int J Surg Case Rep. 2014;5(12):1068–71.
7. Tepelenis K, Papathanakos G, Kitsouli A, Troupis T, Barbouti A, Vlachos K, et al. Osteochondromas: An Updated Review of Epidemiology, Pathogenesis, Clinical Presentation, Radiological Features, and Treatment Options. In Vivo (Athens, Greece). 2021;35(2):681–91.
8. Göçmen S, Topuz AK, Atabey C, Şimşek H, Keklikçi K, Rodop O. Peripheral nerve injuries due to osteochondromas: analysis of 20 cases and review of the literature. J Neurosurg. 2014;120(5):1105–12.
9. Costales JR, Socolovsky M, Sánchez Lázaro JA, Costales DR. Peripheral nerve injuries in the pediatric population: a review of the literature. Part II: entrapment neuropathies. Child's Nervous System. Official J Int Soc Ped Neurosurg. 2019;35(1):37–45.
10. Kozu T, Machida M, Taira K, Oikawa N, Nemoto N, Nakanishi K. Peroneal Nerve Palsy Caused by Proximal Fibular Solitary Osteochondroma: Case Report and Literature Review. Case Rep Orthoped. 2022;2:5865040.
11. Huntley K, Al-Hardan W, Pretell-Mazzini J. Surgical Management of Benign Tumors of the Proximal Fibula. J Am Acad Orth Surg. 2021;5(9):207.
12. Cardelia JM, Dormans JP, Drummond DS, Davidson RS, Duhaime C, Sutton L. Proximal fibular osteochondroma with associated peroneal nerve palsy: a review of six cases. J Ped Orthopaed. 1995;15(5):574–7.
13. Birch CM, Smit KM, Sucato DJ. Peroneal nerve function before and following surgical excision of a proximal fibular osteochondroma. J Ped Orthopaed. 2021;41(1):61–6.
14. Langridge B, Griffin MF, Akhavani MA, Butler PE. Long-Term Outcomes following Pediatric Peripheral Nerve Injury Repair. J Hand Microsurg. 2020;12(1):27–31.
15. Shah N, Vemulapalli K. Foot Drop Secondary to Ankle Sprain in Two Paediatric Patients: A Case Series. Cureus. 2022;14(6):26398.

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