Orthopaedics & Traumatology: Surgery & Research (2011) 97S, S1—S4

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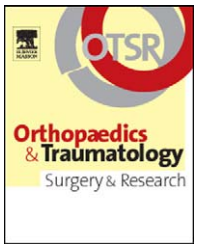

WORKSHOPS OF THE SOO (2010, LA ROCHELLE). TECHNICAL NOTE

Fascial flap protecting the fibular nerve: A rare childhood case

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KEYWORDS
Fibular nerve compression;
Child;
Exostosis;
Fascial fl

Summary Compression of the peripheral nerves (PNs) induces intraneural lesions, which, once surgical decompression has been achieved, requires that the peripheral scar tissue be as non-adherent as possible. This allows optimal nerve tissue regeneration and the flexibility necessary for longitudinal movements of the PNs. In cases showing a risk for adherence, tissue interposition (with fat, muscle, fascia, etc.) can be proposed. The authors describe the use of a fascial flap of the fibular muscles used to protect the fibular nerve (FN) and the fibula head. This flap procedure was performed in a case of PN compression due to exostosis of the fibular nerve in a child.

Introduction

The peripheral nerves (PNs) should be able to adapt their length during limb movement [1]. If this mobility is reduced following compression, intraneural lesions can appear [2]. During surgical decompression, perineural scar fibrosis may create points of adherence and thus limit the flexibility and adaptability of the PNs to movement [3]. To reduce this scar fibrosis and allow nerve regeneration, protection by tissue interposition has been proposed [4].

We present the fascial flap interposition technique performed for a rare cause of fibular nerve (FN) compression by exostosis of the fibular head in a child.

Clinical case

A 10-year-old child consulted for the onset of pain in the right leg and foot arising during exercise and when playing soccer. The clinical examination showed bilateral pes cavus, more pronounced on the right, and paresis of the dorsal flexors. Gait was not disturbed. Palpation of the calf was not painful, but the fibular head was prominent and sensitive. A positive Tinel sign appeared during percussion on the fibular head. The AP and lateral x-rays of the right knee (Fig. 1) showed substantial exostosis of the fibular head.

The diagnosis of FN compression was made and confirmed by electromyogram, which demonstrated a conduction disorder.

Surgery and technique

Surgery was performed under general anesthesia with a pneumatic tourniquet at the root of the limb.

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doi:10.1016/j.otsr.2011.03.010

Figure 1 AP knee x-ray, exostosis of the fibular head.

A lateral approach to the knee and the upper third of the leg was used, centered by the fibula head. The fibular nerve was exposed and found to be separated into its two main branches, stretched and compressed by the exostosis (Fig. 2). Neurolysis of the FN was carried out under loupe magnification ($\times 4$) and the nerve was pulled back very gently using surgical ties.

The periosteum plane was incised and the Pauwels osteotomy was carefully performed with blade plate fixation, keeping the proximal epiphysis and the growth cartilage intact (Fig. 3). The bone plane was then found directly in contact with the FN, with the risk of creating a scar interface that could prevent sliding of the nerve tissue.

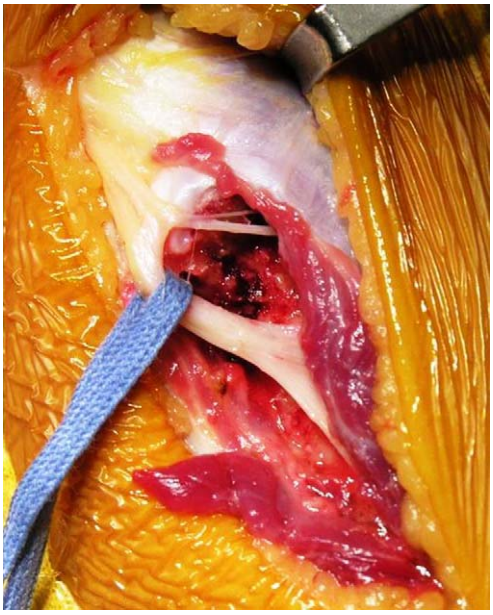

Figure 3 Aspect after neurolysis of the fibular nerve and exostosis osteotomy.

A fascial flap of the fibular muscles was harvested to fit the size of the area to cover (Fig. 4). It was separated from the muscle plane using scissors and remained pedicled in its distal part. Lifting the flap distally allowed it to be raised easily. It was then passed through the muscle bodies and under the FN and its branches using a dissector (Fig. 5). Finally, the flap was sutured to the periosteum of the fibula head, thus isolating the bone tissue from the FN (Fig. 6).

The subcutaneous and cutaneous planes were then closed. Weightbearing was relieved for three weeks using crutches.

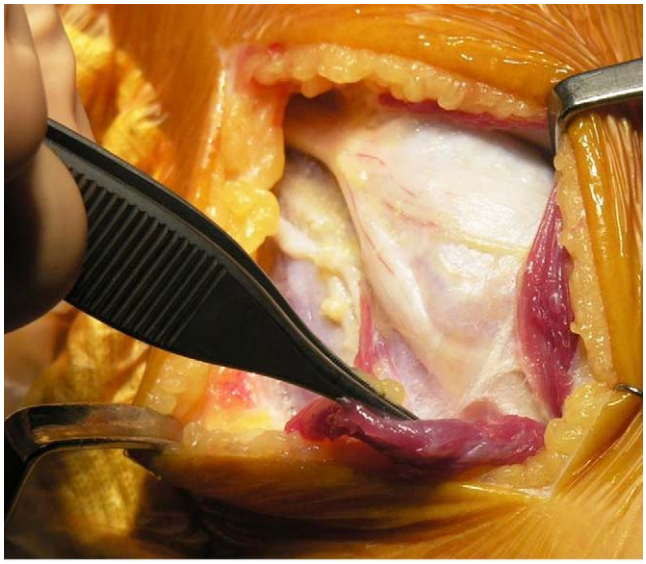

Figure 2 Fibular nerve before decompression; the branches are compressed.

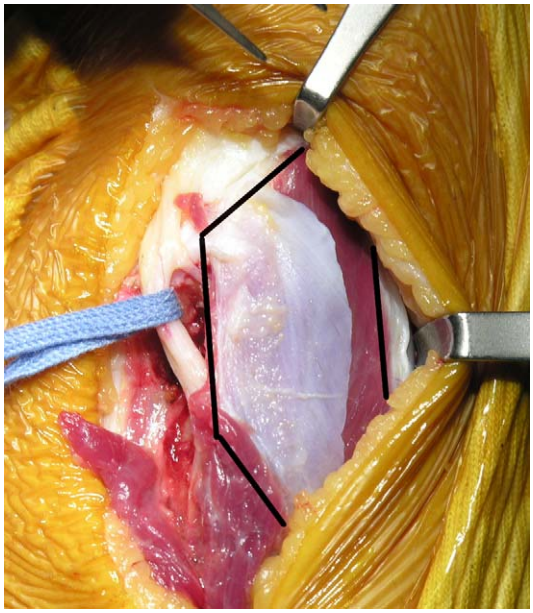

Figure 4 Raising the quadrangular fascial flap, pedicled distally (incision on dotted lines).