CASE REPORT

Intraneural ganglion cyst on the external popliteal nerve

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SUMMARY

There are many causes for the paralysis of the external sciatic popliteal nerve, such as the intraneural ganglion cyst. In this case, we evaluate a 52-year-old woman with no relevant personal record, who was admitted with paresis of the right foot of 4 months of evolution associated with alterations in the sensitivity that rose up to the posterolateral region of the leg. The diagnosis was based on MR and cyst decompression and disconnection of the articular branch. Given the low incidence of these lesions, their origin is still subject to controversy. The most widely accepted theory is the unifying articular theory described by Spinner in the year 2003. Intraneural ganglion cysts must be included in the differential diagnosis of progressive paralysis of the sciatic nerve, lesions of the nerve root at L5 and nerve sheath tumours that start at the lateral compartment of the knee. The treatment of a fibular intraneural ganglion cyst must be surgical and the operation must be performed as soon as possible.

BACKGROUND

This case is of great value because of the low incidence of the pathology and its great result described with adequate surgical treatment as Spinner describes in his articular theory.

CASE PRESENTATION

The patient is a 52-year-old man with no relevant personal record who had not had previous operations, no associated diseases or known allergies. He is admitted with a decreased sensitivity on the sole of the foot and the external side of the leg, together with steppage gait of 4 months of evolution.

The exploration shows loss of strength (2/5) in the dorsiflexion of the foot and right hallux extension, absence of lumbar pain on palpation, presence of osteotendinous reflex and negative results for Lasegue, Valsalva and Bragard tests.

A lumbar nuclear MR (NMR) was performed, and it did not reveal an acquired spinal pathology derived from the involvement of the right L5 nerve. Afterwards, an electromyography was performed, and it showed a decreased conduction in the external sciatic popliteal (ESP) nerve.

A second examination of the knee did not show lack of stability, with a complete articular balance, and the exploration of the ligament structures was negative. Tinel's sign was negative in the ESP nerve at the head of the fibula.

The X-ray of the knee was normal, and an NMR showed a multilobulated image of approximately

2 cm associated with the head of the fibula with an atrophy caused by denervation of the tibialis anterior muscle which was compatible with a malformative lesion or an arthrosynovial cyst (figure 1A–C). An ultrasound revealed a non-vascular anechoic tubular structure inside the ESP nerve compatible with intraneural ganglion cyst that came from the superior tibiofibular joint (figure 1D).

DIFFERENTIAL DIAGNOSIS

Lesions of the nerve root at L5 and tumours that appear in the lateral compartment of the knee.

TREATMENT

We decided to implement a surgical treatment of the ganglion cyst and our approach followed the techniques described by Spinner.^{1–2} The ESP nerve was dissected from the head of the fibula to the bifurcation of the common sciatic trunk (figure 2A, B). The ganglion was ligated in the joint area, as well as its communication with the nerve branch (figure 2C). The joint capsule was resected and a neurolysis was performed in the ESP nerve path, draining the liquid contents of the cyst (figure 2D). We verified the absence of a ganglion cyst cross-over in the posterior tibial nerve.

OUTCOME AND FOLLOW-UP

The patient showed a good evolution after 1 year, with total recovery of sensitivity and a two-point recovery of strength (4/5).

DISCUSSION

Ever since it was first described in 1810 by Beauchêne, intraneural ganglion cysts have been a subject of interest and study for several authors. Owing to the low incidence of these lesions, their aetiology is still a matter of controversy. However, the most widely accepted theory is currently the articular unification theory described by Spinner in 2003,^{3–5} which suggests that the true origin of these lesions is the superior tibiofibular joint and that the dissection of the epineuron of a small branch of the ESP nerve (articular branch), the mucinous content moves proximally until it reaches the main trunk of the nerve and its two main terminal branches. This small branch starts precisely in the bifurcation of the nerve, which is in fact a three-way fork.^{6–8}

The common fibular nerve is a branch of the sciatic nerve, which separates in the popliteal fossa and is later divided into deep and superficial fibular nerves. It is responsible for the dorsiflexion and eversion of the foot via the tibialis anterior muscle

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Figure 1 (A and B) MR coronal section that shows the start and end point of the lesion; (C) transverse section of the lesion; (D) ultrasound with the same image.

and the fibularis longus and brevis. Therefore, a lesion in this area will lead to a drop of the foot and symptoms of neural irritation in the anterolateral section of the leg.^{9 10}

The ultrasound or MR can be used as an imaging technique to confirm the diagnosis. The ultrasound shows the cyst as an anechoic and well-circumscribed lesion. However, it fails to provide a clear definition of the surrounding tissue, while the MR can be used to identify the anatomical relationship between different cysts in articular structures, and to assess the presence of associated abnormalities in the knee.^{11 12}

It is important to carry out a diagnosis of this kind of pathologies as early as possible. Afterwards, the recommended treatment is simple and conservative, which requires a decompression—if possible—with a complete removal of the cyst. This must be accompanied by a ligation of the pedicle and, more importantly, of the articular branch of the fibular nerve, which must be dissected in order to prevent recurrence.^{13 14}

In many cases, a cyst decompression leads to clinical improvement a few days after surgery, which goes on progressively and steadily in the following months. An analysis of the reviewed literature revealed that the best results were achieved in relation to

pain control, because the recovery of motor function is less predictable and more changeable. Predicting the evolution of the patients is more difficult because the ESP nerve does not generally recover as easily as other nerves.

Nowadays, the implementation of this theory has been essential for a decreased recurrence rate and better clinical results.

Learning points

- ▶ Prepare an adequate clinical record of the patient to rule out the different differential diagnoses that may interfere with a later decision with regard to the described pathology.
- ▶ Know and appreciate the importance of Spinner's articular theory to reach a precise diagnosis and an adequate treatment.
- ▶ After a complete diagnosis, the surgical treatment consists of the resection of the articular branch which feeds the cyst, followed by a re-evaluation of the need of draining the cyst.

Figure 2 (A and B) Dissection of the popliteal sciatic nerve and its articular branch; (C) articular branch that explains Spinner's theory; (D) drainage of the contents of the intraneural ganglion cyst.

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