CASE REPORT

Compression neuropathy of the common peroneal nerve by the fabella

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SUMMARY

The fabella is a normal anatomical variant and has been found in up to 30% of the general population. We present the case of a 67-year-old man with pain down the lateral aspect of the left lower limb of 18 months duration. A clinical examination revealed a palpable fabella and nerve conduction studies confirmed a common peroneal nerve neuropathy at its level. Dynamic ultrasound scan and MRI of the knee showed the fabella to be impinging on the common peroneal nerve. Operative excision of the fabella was performed with significant improvement at 3 months and full recovery at 1 year. A literature review has shown that the last reported case of a compression neuropathy of the common peroneal nerve was in 1976. Anatomical considerations need to be taken into account and operative treatment has been recommended due to the favourable outcome in this case.

BACKGROUND

The fabella has been considered to be of limited clinical significance. It is a sesamoid bone and is often mistaken for an intra-articular loose body, fracture or osteophyte. It is found embedded in the tendon of the lateral head of gastrocnemius behind the lateral femoral condyle. It's a normal anatomical variant and has been reported to be present in up to 30% of individuals.¹ In total 70–80% are present bilaterally and its incidence is higher in people of far eastern descent. Compression neuropathy of the common peroneal nerve has previously been reported as having various causes, however the fabella is not fully appreciated as a causative factor. Tajima and Hotta² first reported on peroneal nerve palsy due to the fabella in 1963 and the last reported case being in 1976.³

Compression neuropathy of the peroneal nerve is a very rare diagnosis; patients with this condition often present late due to difficulty in diagnosing the condition. We present a sequence of investigations to aid diagnosis and a treatment plan for an individual with this condition.

CASE PRESENTATION

We report a case of a 67-year-old man, with a medical history of polio from 11 months of age, presenting with pain down the lateral aspect of the lower leg of 18 months duration. His symptoms were exacerbated on foot inversion and knee extension; this was attributed to the common peroneal nerve flicking over the fabella, which was subsequently proved on dynamic ultrasound scanning. He was initially treated conservatively, as the source

of compression was thought to be secondary to his ankle foot orthosis (AFO). His symptoms did not improve after he stopped using the AFO. A lumbosacral MRI was arranged to rule out root compression as a cause. Clinically Tinel's test was negative but the patient had a large palpable fabella. The patient did not have any peripheral or dermatomal sensory deficit and motor function assessment was complicated by the fact that he had a foot drop secondary to polio.

INVESTIGATIONS

Nerve conduction studies confirmed a compression neuropathy at the level of the fibula head. MRI were performed of both knees and on the left side a flexion/extension MRI was performed (refer figures 1–4).

Flexion/extension scans were performed to assess the proximity of the nerve to the fabella, and a scan of both knees (figure 5) was used to assess whether the fabella was merely an incidental finding. Results showed that the fabella on the left side was laterally subluxed and adjacent to the common peroneal nerve and it was more prominent in extension.

Figure 1 MRI T1 sagittal (in extension) showing the fabella to be more prominent in extension and causing 'tenting' of the nerve.

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Figure 2 MRI T1 sagittal (in flexion).

TREATMENT

Prior to surgical excision one could feel the peroneal nerve superficial to the fabella. The fabella was approached through a lateral incision, at the posterior border of biceps femoris over the enlarged fabella. The peroneal nerve was isolated and preserved; it had a 'sun blushed' appearance and was slightly flattened where it had been in proximity to the fabella. The fabella was excised and measured 2.3 cm×2.0 cm.

OUTCOME AND FOLLOW-UP

Postoperatively the patient made a remarkable recovery by 3 months and had a full resolution of symptoms at 1 year.

DISCUSSION

The common peroneal nerve is vulnerable to injury. It usually begins at the superior angle of the popliteal fossa and passes

Figure 3 MRI T1 axial (in extension).

Figure 4 MRI T1 axial (in knee flexion).

medial to the biceps femoris tendon and leaves the popliteal fossa by passing superficially to the lateral head of the gastrocnemius muscle. It then winds around the neck of the fibula, where it lies superficial and is prone to injury, and travels deep into peroneus longus muscle.⁴ A literature review has revealed numerous aetiologies for peroneal nerve neuropathies. These include prolonged squatting/leg crossing,⁵ low-grade infection,⁶ varicose veins,⁷ marked weight reduction,⁸ schwannoma,⁹ giant plexiform neurofibromatosis,¹⁰ pneumatic compression,¹¹ total knee arthroplasty, proximal tibial osteotomy¹² and ganglion cysts.¹³ The exact function of the fabella is unknown. Sesamoid bones infer a biomechanical advantage by increasing the lever arm of the pull of a muscle. Their formation may be due to a genetic predisposition or mechanical stresses and loading through a muscle, which may alter biological pathways, ultimately leading to osteocartilaginous metaplasia.¹⁴ An enlarged fabella features as a very rare cause of compression neuropathy of the peroneal nerve. Only one case has been reported outside Japan by Mangieri,¹⁵ who noted a good clinical outcome at 24 months with operative excision. It has also been noted that patients fair well with operative decompression of the peroneal nerve for ganglion cysts, with good-to-excellent results in 87% of the cases.¹⁶ In our case operative decompression took place at 18 months with full recovery at 1-year postoperatively. In this particular instance our patient's symptoms may have been exacerbated by the fact that he had polio. There may have been less soft tissue interposition between the fabella and the common peroneal nerve due to muscle atrophy, thus making it less amenable to conservative treatment.

In summary, we have described a rare case of peroneal nerve compression neuropathy secondary to a fabella, which responded very well with operative excision of the fabella.

Figure 5 MRI T1 axial both knees for comparison.

Learning points

- ▶ The flabella is a sesamoid bone found embedded in the tendon of the lateral head of gastrocnemius behind the lateral femoral condyle.
- ▶ The flabella is often mistaken for an intra-articular loose body, fracture or osteophyte.
- ▶ Compression neuropathy of the peroneal nerve is a very rare diagnosis, often present late due to difficulty in diagnosing the condition.
- ▶ Nerve conduction studies and flexion/extension MRI are key investigations for diagnosis and preoperative targeting.
- ▶ Surgical excision of the flabella has had an excellent outcome in our case.

Contributors RS was involved in the final editing, writing and submission of the manuscript. AP and BJ were involved in the care of the patient and providing case and writing of the case report.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Duncan W, Dahm DL. Clinical anatomy of the fabella. *Clin Anat* 2003;16:448–9.
- 2 Tajima T, Hotta T. A case of peroneal nerve palsy due to fabella. *Tohoku J Orthop* 1963;7:310–14. (in Japanese).
- 3 Itoman M, Yamamoto M, Okuda T, *et al.* A case of peroneal nerve palsy due to fabella. *J West Jap Orthop Trauma* 1976;25:322–5. (in Japanese).
- 4 *Grays anatomy*. 40th edn. Churchill Livingstone, 2008:1418–24.
- 5 Yilmaz E, Karakurt L, Serin E, *et al.* Peroneal nerve palsy due to rare reasons, a report of three cases. *Acta Orthop Traumatol Turc* 2004;38:75–8.
- 6 Schulze J, Troeger H. Fibular nerve compression due to an unusual cause. A case report. *Handchir Microchir Plast Chir* 2004;36:25–8.
- 7 Yamamoto N, Koyano K. Neurovascular compression of the common peroneal nerve by varicose veins. *Eur J Vasc Endovasc Surg* 2004;28:335–8.
- 8 Shahar E, Landau E, Genizi J, *et al.* Adolescence peroneal nerve neuropathy associated with rapid marked weight reduction: case report and literature review. *Eur J Paediatr Neurol* 2007;11:50–4.
- 9 Mahitchi E, Van Linthoudt D. Schwannoma of the deep peroneal nerve. *Praxis (Bern 1994)* 2007;96:69–72.
- 10 Cebesoy O, Tutar E, Isik M, *et al.* A case of isolated giant plexiform neurofibroma involving all branches of the common peroneal nerve. *Arch Orthop Trauma Surg* 2007;127:709–12.
- 11 Fukuda H. Bilateral peroneal nerve palsy caused by intermittent pneumatic compression. *Intern Med* 2006;45:93–4.
- 12 Mont MA, Dellon AL, Chen F, *et al.* The operative treatment of peroneal nerve palsy. *J Bone Joint Surg Am* 1996;78:863–9.
- 13 Greer-Bayramoglu R, Nimigan AS, Gan BS, *et al.* Compression neuropathy of the peroneal nerve secondary to a ganglion cyst. *Can J Plast Surg* 2008;16:181–3.
- 14 Sarin VK, Erickson GM, Giori NJ, *et al.* Coincident development of sesamoid bones and clues to their evolution. *Anat Rec* 1999;257:174–80.
- 15 Mangieri JV. Peroneal nerve injury from an enlarged fabella. *J Bone Joint Surg Am* 1973;55:395–7.
- 16 Fabre T, Piton C, Andre D, *et al.* Peroneal nerve entrapment. *J Bone Joint Surg Am* 1998;80:47–53.

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