■ CASE REPORT

Sciatic nerve palsy after total hip replacement

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We report a case of sciatic nerve palsy following total hip replacement which has led to a novel hypothesis to account for this complication.

Sciatic nerve palsy after total hip replacement (THR) may result from direct injury of the nerve.¹⁻⁶ Occasionally, a palsy may occur without an obvious cause.⁴ The case we now report is the basis for an hypothesis to account for some idiopathic palsies.

Case report

A right THR was performed on a 56-year-old woman at another hospital. Immediately after the procedure, a sciatic palsy developed. Four weeks later, the patient fell and loosening of the acetabular component was diagnosed. She was referred to our care at four months. Neurophysiological tests were performed and a palsy affecting both the medial and the lateral components of the sciatic nerve was identified. Neither was complete although the lateral component was more severely affected than the medial.

At revision of the acetabular component (Fig. 1), a variant of the relationship between

the sciatic nerve and the piriformis muscle was found. The lateral part of the nerve penetrated the muscle and the medial half passed distal to it (Fig. 2). The piriformis had retracted after an external rotator tenotomy performed at the primary surgery. The nerve was stretched, adherent to the muscle and embedded in immature scar tissue. Part of the piriformis was resected to release that part of the nerve passing through the muscle while the remainder of the nerve was dissected from scar tissue. After the operation, sciatic nerve function started to improve and gradually progressed to full recovery. Nerve conduction one year after the revision procedure showed normal function.

Discussion

Variants of the normal relationship between the piriformis muscle and the sciatic nerve, involving the penetration of the muscle either by the lateral part or the whole nerve occur in about 15% of cadavers. These variants first

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Fig. 1a

Fig. 1b

Radiographs showing a) loosened acetabular component and b) after revision.

Fig. 2a

Fig. 2b

Figure 2a – Intra-operative photograph of the hip (1, lateral part of sciatic nerve; 2, medial part of sciatic nerve; 3, upper part of piriformis muscle; 4, lower part of piriformis muscle; 5, the line of piriformis tenotomy performed during primary THA). Figure 2b – Diagram. The hypothesis to account for sciatic nerve palsy after piriformis tenotomy.

Fig. 3

A dissection of a Type IV (Beaton) variant as described in this case. The forceps grasp the upper and lower parts of the piriformis muscle. The sciatic nerve passes partly through and partly below the muscle.

described in 1897,⁷ were classified in 1937⁸ and are included in textbooks of anatomy.⁹ This report is concerned with the most common variant^{8,10,11} (Fig. 3).

We suggest that in some of the currently inexplicable sciatic nerve palsies after THR the piriformis tendon may have been divided at operation (as in our case) and in the presence of an anatomical variant involving the penetration of piriformis by the whole sciatic nerve, or only its lateral fibres, the subsequent medial retraction of the piriformis muscle may drag the penetrating part of the nerve with it, damaging the nerve in the process (Fig. 2).

Although this mechanism may have accounted for our case, the frequency could only be gauged by exploration of other hips in cases of sciatic nerve palsy after THR and piriformis tenotomy. No other case has come under our care. We put forward this hypothesis in the hope that surgeons may explore apparently idiopathic lesions in the future. If part or the whole nerve was found to penetrate the muscle, division or resection of the muscle might validate the hypothesis and promote recovery, as it did in this case.

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