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Case report

Sciatic nerve injury following hamstring harvest

Glen Vardi*

Droitwich Knee Clinic, St Andrews Road, Droitwich Spa, Worcs WR9 8DS, UK

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Abstract

Injury to the sciatic nerve following harvesting of the medial hamstring tendons is a complication that has not been described. I report a unique case of sciatic nerve injury above the level of its bifurcation into its terminal branches following hamstring graft harvest for use in ACL reconstruction. The sciatic nerve anatomy and technique of graft harvest is briefly described.

Keywords: Sciatic nerve injury; Hamstring harvest; ACL reconstruction

1. Case report

A 33-year-old lady was presented with the diagnosis of anterior cruciate ligament deficiency following a twisting injury to her left knee 16 years earlier. Symptoms of giving way were occurring more regularly and during everyday activities. She requested that her cruciate ligament be reconstructed.

She underwent the surgery, which was performed arthroscopically in a standard fashion using a four-strand hamstring tendon graft after harvesting semitendinosis and gracilis. A one inch longitudinal incision over the pes anserinus was used to gain access to the tendons at their insertion point on the tibia. A Linvatec graft harvester was used to strip the tendons. No leg holder or sand bag was used when harvesting the tendons. The patient is usually placed in the 'figure-four' position with the knee flexed to between 80 and 110° to reduce the stretch on the posterior thigh structures (Fig. 1). A tourniquet was not used.

Standard tibial and femoral tunnels were made after insertion of guide wires. The tunnels measured 8 mm.

After passing the graft, the fixation was carried out using 2 bioabsorbable rigidfix cross-pins (Mitek) on the femoral side and with a 9 mm by 25 mm bioabsorbable interference screw and an AO screw and washer on the tibial side as a post.

The post-operative instructions were routine and she was to follow an accelerated rehabilitation program.

Immediately post-operatively it was apparent that she presented with a dense foot drop and loss of sensation from the knee distally. This did not improve in the subsequent few days and upon her discharge a neurophysiological opinion was sought. At 2 weeks and again at 4 weeks post-operative nerve conduction studies demonstrated a sciatic nerve injury. It was apparent that the nerve had been injured above its bifurcation in the posterior compartment of the thigh. It was thought that the injury was predominantly neuropraxic in nature and hence reversible. An MRI was obtained to rule out a possible non-traumatic sciatic nerve lesion that could have predisposed the nerve to injury, but this was found to be normal.

Post-operative X-rays showed that the tunnels and fixation were correctly placed with no negative features noted.

After 6 weeks of management with physiotherapy and splinting no improvement was noted and she was referred to a peripheral neurosurgeon for an opinion. Four weeks later she was due to have the sciatic nerve surgically explored when some improvement was noted. The surgery was deferred and eventually cancelled as improvement progressed rapidly.

At 1 year post-operation she has almost full function and complete recovery is expected.

*Tel.: +44-01905-794-858.
E-mail address: glen@vardi.freeserve.co.uk (G. Vardi).

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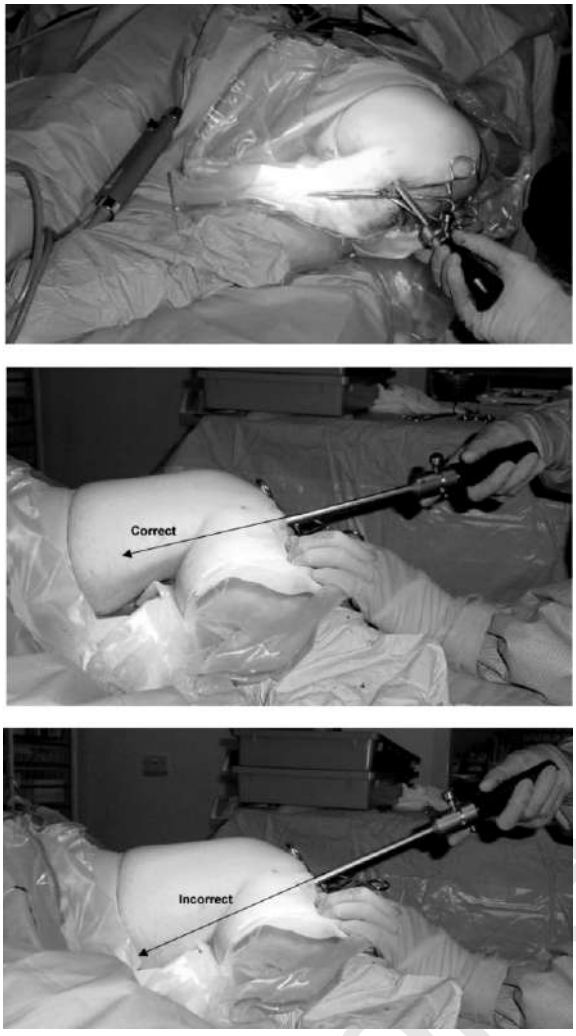

Fig. 1. The position. The patient is in the 'figure-four' position for hamstring graft harvesting.

2. Discussion

The complication of sciatic nerve injury has not, to my knowledge, been described following hamstring graft harvest for use in ligament reconstruction.

The sciatic nerve is the largest single nerve trunk of the body and in the average adult has a diameter about as large as the thumb (16–20 mm). It arises from the L4, L5, S1, S2 and S3 spinal roots and exits the pelvis posteriorly through the greater sciatic foramen and runs laterally along the posterior surface of the ischium anterior to the piriformis muscle. The posterior cutaneous nerve of the thigh accompanies the sciatic nerve as it exits the greater sciatic foramen. The sciatic nerve has medial and lateral components, which separate into the tibial and the common peroneal nerves (Fig. 2).

A number of variations in the course and distribution of the nerve have been reported. Bifurcation into its two major divisions may occur anywhere between the sacral plexus and the lower part of the thigh. The two terminal branches of the sciatic may arise directly from the sacral plexus. The bifurcation has also been reported to occur below the popliteal space [1–4].

In small individuals the sciatic nerve can be found in close proximity to the semitendinosis and gracilis tendons and, therefore, in these circumstances may be prone to injury. This patient was 5 foot 3 inches tall and she weighed 45 kg. Attention should be paid to the direction in which the hamstring graft harvester is advanced. It is advised to aim towards the ischial tuberosity and to remain subcutaneous throughout its course, i.e. in a proximal and medial direction. Any movement towards the midline in a lateral direction brings the harvester dangerously close to the sciatic nerve or the terminal branches of the sciatic nerve if it has bifurcated already (Fig. 3). Pagnani et al. have described the anatomy and technique of hamstring graft harvest [5].

The semitendinosis and gracilis tendons are located at the medial side of the knee between layers I and II as described by Warren and Marshall [6] and by Warren et al. [7]. The sartorius tendon, which is part of layer I, lies superficial to the semitendinosis and gracilis tendons proximally. However, its inferior portion fuses with the semitendinosus and gracilis tendons just proximal to their insertion on the tibia. Together the three tendons form the pes anserinus.

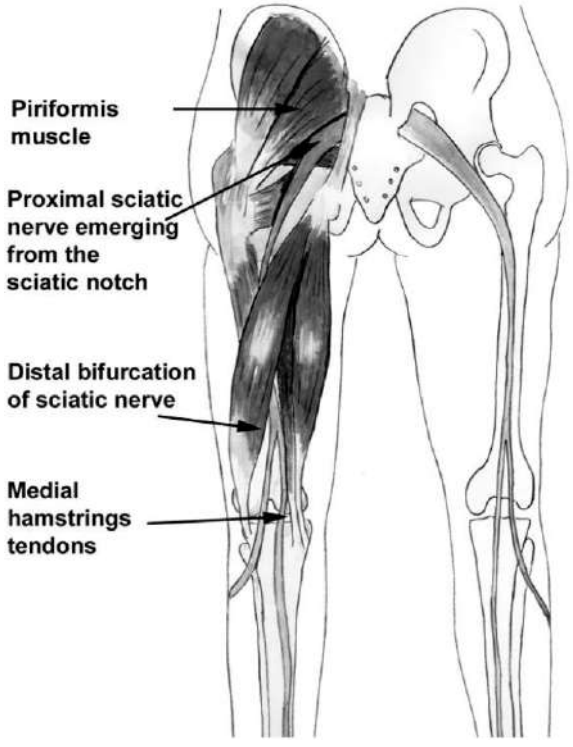

Fig. 2. Simple diagram showing the anatomy of the posterior thigh.

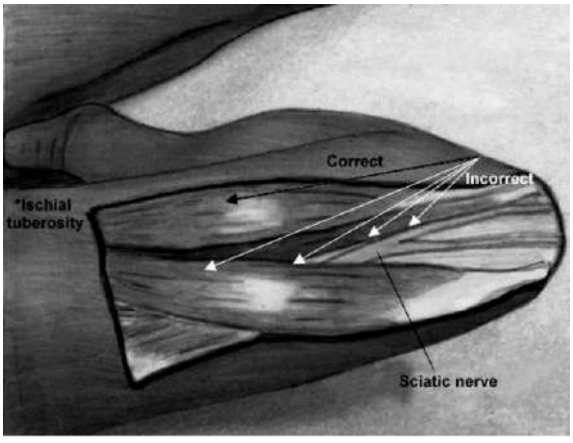

Fig. 3. Superimposed diagram of the posterior thigh from the front in the 'figure-four' position showing the correct and incorrect directions to aim the hamstring graft harvesting.

As dissection proceeds proximally and posteromedially beneath layer I the semitendinosus and gracilis tendons become distinct structures.

One of the most commonly reported neurological complications resulting in pure sensory loss following hamstring graft harvest is that of injury to the saphenous nerve [8–10]. The 'figure-four' position of the leg improves exposure and minimizes tension on the saphenous nerve, sciatic nerve and the tendons, thus reducing the risk of injury.

In conclusion, attention should be paid to the technique of hamstring graft harvest especially in patients who have a small body structure. The complication described here, although very rare is severe and debilitating.

NOTE: The post op XR were reported to be normal and in keeping with an uneventful ACL reconstruction but unfortunately we are not able to locate them now. The patient has left the country to return to Japan and there is no way of finding out where she is.

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