

Saphenous nerve injuries during hamstring ACL reconstruction

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Anterior cruciate reconstruction is the most popular arthroscopic sports injury operation in the world. The overall incidence rate is roughly 30 / 100 000 per year. In Finland there occurs thus about 1 500 ACL injuries per year.

Complications

It is a routine operation in most of the sports trauma centres due to the high incidence. Nevertheless, like all surgery it is prone to complications. Minor ACL surgery complications include: bleeding, infection, numbness around the incision, instrument failure or breakage, painful or abnormal scar formation, knee stiffness, ligament or cartilage injury and allergic skin reaction to tape, dressing, or latex. Major ACL surgery complications include: serious infections, fracture of the kneecap or thighbone, rupture or failure of the graft, thromboembolism, nerve injury, serious bleeding from blood vessel injury, serious reaction to anaesthesia, allergic reaction to medication, persistent pain or numbness, long-term decreased knee motion, persistent swelling of the knee, transmission of disease (if a cadaver graft is used), continued knee looseness or return of the original symptoms or loss of life.

Nerve injuries

The most common complication is nerve injury. Injuries to the saphenous (1,2), sural (3), peroneal (4) and even ischial (5) nerves have been reported. Injuries to the peroneal, sural and ischial nerves are rare; saphenous nerve injuries are common but neuralgias rare (6). The incidence of saphenous nerve injury varies; from 88 % (7) to 74 % (2), hypoesthesia of the ISBN area was observed in 77 % and electro-physiologically detected injuries of ISBN in 68 % (1). In some series a lower incidence from 24 % to 65,7 % has been reported (8). The incidence for IPBSN saphenous nerve injuries has been reported to range from 43 % to 59

% (9) and from 39,7 % to 14,9 % (10). The altered sensation diminishes from 60 % postoperatively to 37 % at minimum follow-up of 13 months (3).

Anatomy of the sural nerve

Sural nerve is sensory branch of the femoral nerve, it descends vertically along the medial side of the knee behind the sartorius, pierces the fascia lata, between the tendons of the sartorius and gracilis, and becomes subcutaneous. It in some cases pierces the tendon of sartorius. The infrapatellar branch runs medially in subcutaneous space at the medio-inferior side of the patella. The sensory branch down runs in intimate contact with saphenous vein.

Prevention

In a cadaveric study when vertical incision was made in 80 % of the knees the IPBSN was injured (11). According to a cadaveric study there seems to be a safe zone to prevent SN injury when using incision from 3,5 cm lateral from the tibial tuberosity extending 5,0 cm lateral and in about 51 to 52 degrees angle (12). So the smaller the incision minimizes the likelihood of nerve injury. However, in harvesting hamstring graft a safe zone does not exist (11). The preparation of the nerve should be done under good visual control in a blunt manner. The pulleys should be cut also under good visual control. The stripper should have a blunt and round distal edge. When suturing only the subcutaneous tissue should be closed and the fascia left open.

Special attention should be addressed for preparation with a concomitant medial collateral injury causing scar formation at the distal end of hamstring tendons. In general the preparation of hamstring tendons should be performed under good visual control with the knee in 90 degrees of flexion and hip in external rotation.

Conclusion

Nerve injuries with hamstring graft preparation occur commonly. They cannot be totally avoided due to the anatomical variations of the nerve and due to the anatomic fact that there exists no real safe zone at the site where the incision for harvesting the tendons is made. However, if the incision is made in 51 – 52 degrees angle and from 3,5 to 5cm lateral from tibial tuberosity, the incidence can be minimized.

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