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CASE REPORT

Posterior compartment of the lower leg reconstruction with free functional rectus femoris transfer after sarcoma resection☆

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Summary A 72-year-old man with the third recurrence of a low-grade liposarcoma of the right lower leg came to our attention seeking limb-salvage surgery. The tumour was removed en bloc with all the superficial posterior compartment of the leg. Appropriate foot flexion was restored by means of a free-functional rectus femoris musculocutaneous flap harvested from the ipsilateral thigh. The patient was kept on a postoperative splint for 6 weeks. Three months after the operation, clinical and elecromyographic signs of reinnervation were observed. The patient was able to walk, run and climb stairs and no donor-site morbidity was observed. Thigh extension was rated M4, comparable to the contralateral thigh. Foot flexion, without any postoperative exercise, was rated M3 with a 30° excursion. To the best of our knowledge, this is the first report of reconstruction of the posterior compartment of the leg r with a free functional rectus femoris flap. We believe this muscle could be the ideal option for such reconstruction.

Limb-salvage surgery is the standard of care for limb sarcomas. Functioning muscle transfers allow the replacement of the resected muscles and the preservation of limb function. The most commonly used flaps are the latissimus dorsi and the gracilis muscle.[1—4]

In this article, we describe a case of posterior compartment of the leg reconstruction after sarcoma resection with a free-functioning rectus femoris musculocutaneous flap, which, to the best of our knowledge, has never been described before.

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Patients and methods

Case report

A 72-year-old man with a low-grade liposarcoma of the right lower leg (Figure 1) at its third recurrence came to our attention after he was offered above-the-knee amputation in another hospital. The mass measured 26 × 14 cm and involved most muscles of the posterior compartment. Limb-preservation surgery was offered to the patient by free-functioning rectus femoris musculocutaneous flap.

On July 2007, the mass was excised en bloc with the gastrocnemius, soleus, plantaris and flexor digitorum longus muscles and the overlying skin. The popliteal, flexor hallucis longus and posterior tibial muscles were spared. The defect (Figure 2) was reconstructed with a free-functioning musculocutaneous rectus femoris flap. A splint garment was used for 6 weeks to avoid tension on the tendon suture while physical therapy was initiated on the third post-operative day to avoid adhesions.

On histopathologic examination, the diagnosis of low-grade liposarcoma was confirmed. Complete resection was achieved with adequate margins.

Immediately after surgery, the remaining deep musculature of the posterior compartment was not sufficient to allow for a good gait without crutches.

Three months after surgery, the transplanted muscle started contracting and the patient was able to walk, climb stairs and run without any limitations in everyday physical activities. Electromyography confirmed reinnervation. The patient did not complain of any donor thigh weakness. Results of strength tests in the donor site showed M4 full-range leg extension according to the British Medical Research Council grading system as modified by Seddon,[5] comparable to the contralateral thigh. Foot flexion was rated M3 and had a 30° range. The patient refused physical therapy and muscle training to improve muscle strength either in the donor or the recipient site. Despite this and his advanced age, functional outcome was satisfactory. Eighteen months after the operation, the patient is alive and well and free of disease.

Surgical technique

After resection, the wound is re-approximated, the leg draped and the patient placed in the supine position. The ipsilateral thigh was chosen as the donor site. A line drawn from the anterior superior iliac spine to the midpoint of the patella corresponds to the major axis of the muscle. The skin island is centred on this line. The pedicle enters the flap deeply from its medial margin approximately 8 cm below the inguinal ligament.

Flap dissection starts distally. The tip of the skin island is incised first, to the level of the deep fascia. The distal tendon is isolated first (Figure 3, upper left).

The skin island is incised circumferentially and secured with resorbable stitches to the muscle. A running suture is placed on the muscle to mark its normal resting tension.

Then, the distal tendon is divided, leaving at least a 6-cm-long distal stump that is sutured with non-resorbable stitches to the tendons of the vastus lateralis and medialis in order to preserve knee stability.

The muscle is freed from the neighbouring muscles. This is a bloodless plane of loose connective tissue (Figure 3, upper right).

The muscle has only one dominant pedicle (Mathes and Nahai type I); thus there is no vessel to ligate during dissection.

The proximal tendon is exposed and the neurovascular pedicle isolated. The pedicle has two cut ends that may allow for flow-through reconstructions (Figure 3, lower left).

Figure 1 Right lateral view (left) and posterior view (right) of the 72-year-old patient with a 26 × 14 cm mass in the posterior compartment of his right leg.