Chapter 7  
The Tensor Fasciae Latae Muscle Flap

The tensor fasciae latae muscle arises from the anterior part of the outer lip of the iliac crest and is invested in a double fascial layer. These fascial layers blend at the junction between the upper and the middle thirds of the lateral aspect of the thigh and course down as the ilio-tibial tract to insert into the lateral femoral condyle. The muscle flexes and rotates the femur internally.

The muscle is provided with a constant blood supply through one reliable vascular pedicle arising from the lateral circumflex femoral artery and its accompanying vein. The motor innervation is through the descending branch of the superior gluteal nerve. The overlying skin has two sources of sensory innervation: (1) the cutaneous branch of the T12 segment (upper part), and (2) the lateral femoral cutaneous nerve (lower part).

The tensor fasciae latae was first described as a free musculocutaneous flap by Hill, Nahai, and Vasconez in 1978.1,2 This musculocutaneous unit can be transferred with motor as well as sensory innervation; there are ample and different types of tissue that may be transferred based on the vascular pedicle of this muscle.3–6 These properties make the tensor fasciae latae muscle a very reliable workhorse for dealing with various reconstructive challenges.4,6

Preparation

If not otherwise dictated by the site to be reconstructed, the patient is positioned supine with the hip and knee joints gently flexed. The thigh is rotated internally, so that its lateral aspect faces the surgeon (Fig. 7.1). The anterior superior iliac spine and the iliac crest are palpated and marked. The line joining the lateral most aspect of the iliac crest and the lateral femoral condyle marks the course of the iliotibial tract.

The position of the patient is determined by the area to be reconstructed. For instance, in using the tensor fasciae latae muscle as a pedicled rotation flap for the reconstruction of decubitus wounds, the patient may be positioned either on the side or in a prone posture.

Neurovascular Anatomy (Fig. 7.2)

The vascular pedicle that nourishes the tensor fasciae latae muscle arises either from the lateral circumflex femoral artery or, in some cases,
directly from the profunda femoris artery as an ascending branch. The pedicle enters the muscle belly \(\sim6–8\) cm distal to the muscle’s origin from the iliac crest. The skin overlying the muscle is richly vascularized by about four or five perforator vessels arising from this vascular pedicle.

The motor innervation is executed from the dorsal aspect through the descending branch of the superior gluteal nerve. The sensory innervation of the overlying skin is accomplished by the cutaneous branch of T12 that enters the lateral thigh region after crossing the iliac crest, and by the lateral femoral cutaneous nerve that enters the anterior border of the lateral thigh skin \(\sim10–12\) cm distal to the origin of the tensor fasciae latae muscle.

The vascular pedicle as well as the motor and sensory nerves can be reliably dissected by orienting oneself on the landmarks as described later.

**Incasions and Dissection**

The iliac crest, the anterior iliac superior spine, as well as the lateral femoral condyle are palpated and marked. A straight line joining the lateral-most aspect of the iliac crest and the lateral femoral condyle mark the approximate course of the musculofascial tract (Fig. 7.3). Moreover, the muscle belly is palpated and marked. If needs be, practically the whole of the skin of the lateral thigh may be raised along with the underlying muscle and fascia based on the single vascular pedicle.

A skin island centered along the tensor fasciae latae muscle belly is described here. Two points, 8 and 10 cm distal to the iliac crest and along the anterior muscle border, are marked. These represent the entry points of the vascular pedicle and the lateral femoral cutaneous nerve, respectively.

The anterior border of the skin flap is incised first, extending the incision in a lazy-S pattern proximally and distally as found necessary. Care is taken to preserve the lateral femoral cutaneous nerve that appears along the incision.

After the anterior border of the tensor fasciae latae muscle has been identified and dissected free, the muscle belly is retracted laterally and dorsally to reveal the entry point of the vascular pedicle \(\sim6–8\) cm distal to the muscle origin). These vessels travel in the septal space between the rectus femoris (anteriorly) and vastus lateralis muscle (posteriorly). Thus the rectus femoris is separated bluntly from the septal space and retracted anteromedially to visualize the course of the vascular pedicle (Fig. 7.4).

Now the posterior incisions of the skin island are completed, taking care to preserve the cutaneous nerve entering the skin island laterally along the iliac crest. The iliotibial tract is dissected and transected as distally as needed.

If the recipient site demands the transfer of a functional muscle, the dissection of the motor nerve is performed as follows: the posterior border of the muscle is freed sharply cut from the fascial attachments and the muscle is retracted anteromedially (Fig. 7.5). The gluteus medius muscle that inserts into the greater femoral trochanter is retracted posteriorly to reveal the motor nerve innervating the tensor...
fasciae latae muscle. This nerve courses between the piriformis (anteriorly) and the gluteus medius muscle (posteriorly). The nerve is now stimulated and transected after confirming the motor response from the muscle flap.

After the muscle or musculocutaneous flap has been cut, the vascular pedicle is followed to its origin, retracting the rectus femoris muscle anteromedially. The artery and veins are transected separately between ligating clips.

The vascular pedicle is ~6–8 cm in length; the vessel diameters are in the order of 2–2.5 mm (artery) and 3 mm (vein). Based on this single vascular pedicle it is possible and reliable to raise the whole of the iliotibial tract along with the overlying skin (~40 × 20 cm). The motor nerve is 1–1.5 mm in diameter and is relatively short in length (approx. 5 cm).

Disadvantages associated with raising a large tensor fasciae latae musculocutaneous flap include muscle herniation and a long scar. Skin grafting may be necessary, where a broad skin flap has been cut.
**Pitfalls**

Dissection of this usually reliable flap may be demanding when an innervated flap has been planned. Particular care is necessary during the posterior dissection, where the motor nerve runs. It is surprisingly easy to transect the innervating nerves, since these are relatively small in caliber and short in length. Some situations may demand a nerve graft between the donor nerve at the recipient site and the motor nerve of the flap, owing to the limited length of the motor nerve. In our experience results after transferring functional muscle flaps were better when no nerve grafts were used.

It is safe to transfer this flap without motor innervation. Recipient sites that definitively demand a motor innervated muscle may be better treated with the gracilis or latissimus dorsi muscle flaps instead of the tensor fasciae latae muscle.

**References**


