

Transfemoral Amputation

Myodesis:

Adductor tissue

The distal attachment of the adductor muscle is demonstrated. This tissue must be preserved and dissected off of the femur to be used for the adductor myodesis.

Adductor tissue dissected

The overlying skin and subq tissue are dissected distally off the adductor fascia to better visualize the adductor. The adductor tissue is dissected off of the femur. The fascia is left with the muscle.

Adductors transected distally

The adductors are transected distally, after preserving adequate length for the adductor myodesis.

Medial hamstring mobilization

Mobilization of the medial hamstring tendon for myodesis (the tendon and the muscle going into the tendon is shown). The tendon is pulled up through a proximal level in the posterior flap. This avoids tethering the subcutaneous tissue in the distal, posterior medial flap and facilitates a better closure of the tissue layer.

Locate unicortical drill hole area

Pointing out the areas on the lateral and anterior femur where unicortical drill holes will be made for the sutures to be passed in and then out of the femur to act as myodesis points.

Drill 4 myodesis holes

Using a 2.5mm drill bit, 4 unicortical drill holes are made in the distal femur. Irrigation is used to cool the drill bit.

First hole is on the anterior-most portion of the femur. The three other holes move laterally from the first.

Four holes allows for the placement of three independent sutures: Anterior (A), Anterior Lateral (AL), and Lateral (L). The suture is of number 2 ticon; a strong non-absorbable suture.

Place 1st suture (A)

Suture is first passed from the outside of the cortex into the medullary canal. Suture is often easier to pass then from inside the bone with the blunt end of the needle as the sharp end gets caught in the trabeculi of the bone. This suture is placed in the first and second holes, starting medially. It is the most superior/anterior suture – anterior suture “A”.

Clamp suture

Suture “A” is clamped, the needle is left in place.

Unblock trabecular bone

If needed, a pointed bone clamp can be used to unblock trabecular bone from the pathway into the cortical bone hole.

Place 2nd suture (AL)

The second suture (anterior lateral, “AL”) is passed using the blunt end of the needle in order not to damage the first suture and weaken it. The sutures share space within the central two holes. This suture is placed in the second and third holes.

Place 3rd suture (L)

The third suture (lateral, “L”) is placed in the third and fourth holes.

“A” suture used for myodesis of medial hamstring

The medial hamstring tendon and muscle are mobilized. The anterior suture will be used to myodese the medial hamstring muscle by suturing in the tendon, near the myotendinous junction.

A locking Krakow suture technique is used within the tendon to obtain secure fixation and minimize devascularization of the tendon tissue.

Medial hamstring tied up over femur

After suturing the tendon with the anterior suture (“A”), the medial hamstring is myodesed up and over the distal femur.

Tendon secured

The myodesis is secured with a second pass of the suture through the tendon.

Excess tendon is removed

The tendon can be secured to the periosteum as well.

Adductor muscle advanced

The adductor muscle with its fascia is advanced over the distal end of the femur to illustrate where it goes and how the AL and L sutures will be used to secure the two separate parts of the fascia for a secure myodesis.

Posterior muscle fascia sutured

Before the adductor myodesis, the posterior muscle fascia is brought up over the distal end of the femur and secured to the hamstring tendon and periosteum with absorbable suture.

Suture adductor fascia

The illustration shows the placement and locking points for the Krakow technique suture used to secure the adductor tendon.

The lateral (L) suture is placed through the adductor fascia, securing the posterior edge of the fascia and the central portion of the fascia again with a Krakow locking suture technique.

The central (AL) of the three sutures is identified. This is used to secure the central portion of the adductor fascia and then the anterior portion of the adductor fascia with a Krakow locking suture technique.

Adductor muscle secured

Adductor is mobilized across the femur and suture advanced and tied. As one strand secures the tendon in a locking fashion, the suture must be tightened by advancing the free end of the suture through the drill holes in the femur and pulling the adductor fascia up and over the femur to secure it in place.

Now, the second suture is secured.

Deep quadriceps myodesis

Absorbable suture is used to secure the deep fascia of the quadriceps to the myodesis point by suturing it to the adductor fascia and periosteum.

A second suture is used to secure the deep fascia of the vastus lateralis to the myodesis point.

More sutures placed to secure the deep quadriceps fascia to the myodesis area on the distal femur and help keep the femur centralized within the muscle mass.

In a transfemoral amputation, the greater trochanter and abductor muscle insertion remain normal, so abduction remains strong. The lesser trochanter and attachment of the iliopsoas tendon also remain normal and therefore flexion remains strong. The main goal in a transfemoral myodesis is to try and restore some extension and some adductor strength to the limb. This helps rebalance the limb between flexion and extension, and abduction and adduction.