Transtibial Amputation with Extended Flap and Bone Bridging

Closure:

Test the extended posterior soft tissue flap position:
For extended posterior flap technique.

Irrigate to remove debris:
Irrigate to clean, remove bone dust, and old blood.

Insert drain:
Bring drain out laterally in the muscular area. A medial exit can cause painful scarring. Cut drain between holes**.**

Close medial fascia:
Bring the medial fascia to the soleus fascia. The fascial closure needs to be secure. It is typically performed with an absorbable suture of moderate strength such as O suture material.

Trim flap corner for optimal alignment

Check flap alignment

Close lateral fascia:
The fascial closure needs to be secure. It is typically performed with an absorbable suture of moderate strength such as O suture material.

Trim flap corner for optimal alignment

Create flap inset and trim flap:
The skin is marked anteriorly to define the area of inset for the extended posterior flap. The flap is positioned to trial the inset, and a scalpel is used to dissect through the epidermis and dermis. The epidermis and dermis are dissected up off of the subcutaneous tissue. The subq tissue is preserved to provide extra padding for the tibia.

Suture fascia to inset flap and perform the myodesis:
Fascial sutures of the superficial fascia and the fascia of the soleus are used to inset the flap to the fascia over the tibia. The muscle itself is not sutured. Securing the posterior flap up and over the tibia and securing the fascia of the flap to the tibia is in essence a **myodesis**.

Comments on myodesis:
Muscular Closure:

- The muscular closure should be considered as reconstruction. In the transtibial amputation the fascia of the superficial muscular compartment is advanced up and over the end of the tibia to the sewn into the periosteum of the tibia and to the fascia of the anterior compartment. Since this muscular fascia is sewn to the bone via its periosteum, this is a myodesis. Some surgeons prefer to drill holes in the edges of the tibia just medial and lateral to its crest. I personally have found that I am better able to advance the muscle proximally up and over the tibia by sewing to periosteum, and am not able to advance the muscle as well using the drill hole technique.
- In the extended posterior flap technique, the fascia is advanced several cm up and over the tibia. When the flap is inset, it is secured to the anterior tibial periosteum and creates the area of myodesis.
- The myodesis and securing the inset of the extended posterior flap are typically performed with an absorbable suture of moderate strength such as number 1 or O suture material.

Trim the flap:
The flap is trimmed on the medial and lateral corners.

Suture fascia:
Place medial and lateral fascial stitches to inset the medial and lateral edges of the flap.

Tie the sutures:
Bring the flap down into position.

Trim the edges

Subcutaneous tissue closure:

1. Skin healing in an amputation surgery can take longer than in other surgical procedures. A subcutaneous closure can help re-enforce the approximation of the skin edges and minimize wound dehiscence. Horizontal subq dermal sutures are placed to inset the flap.
2. The subcutaneous closure is typically performed with an absorbable suture of light strength such as 2-O suture material.

Nylon skin sutures:

1. Skin healing in amputation surgery can take longer than in other surgical procedures. A suture technique that minimizes trauma to the skin edge is needed. I typically use 3-O nylon suture and prefer it over staples as I can leave the nylon in longer with less irritation. It is not uncommon to leave sutures in 4 or 5 weeks. I have found that skin staples tend to show irritation and redness sooner than nylon suture.

Appearance of the extended posterior flap:
The initial appearance of the extended posterior soft tissue flap is quite bulbous and bulky. However, in a very short period of time the edema and the volume of the extended flap resolve, leaving a residual limb with a very well padded distal tibia and a contour that fits nicely into a prosthesis.