

## **Anterolateral Thigh Free Flap for Soft-Tissue Coverage of an Open Both-Bone Fracture**

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### **Proposal**

This video shows the technique for management of a grade IIIB open both-bone fracture, from definitive bony fixation to anterolateral thigh (ALT) free flap reconstruction, which is an effective reconstructive option.

### **Case Overview**

The patient shown in this video is a young, right hand–dominant male with a type IIIB open both-bone fracture of the right forearm. The patient previously underwent external fixation and débridement at an outside institution. Because of the extensive soft-tissue damage and exposure of tendon and bone, additional débridement was required for wound assessment. For definitive management, plates were used for bone fixation via a standard two-incision approach, after which ALT free flap reconstruction was performed for coverage. This consisted of a thin, pliable flap with underlying fascia, which affords an optimal tendon gliding surface and cosmetically similar skin.

An elliptical ALT flap (8 × 14 cm) from the right thigh based on the descending branch of the lateral circumflex artery runs intramuscular on the medial border of the vastus lateralis. The flap harvest used the interval between the vastus lateralis and the rectus femoris as a landmark. Simultaneously, the right forearm was débrided, and the ulnar artery and veins were exposed deep to the flexor carpi ulnaris tendon. The ulnar artery was clamped temporarily to assess radial blood flow to the hand. An arteriotomy was performed in the ulnar artery, and the ALT flap pedicle was anastomosed end-to-side into the artery using a microscope. The two ALT flap veins were hand-sewn to the donor veins. The flap was inset and closed, and the forearm was immobilized in a volar splint to avoid pressure on the pedicle.

### **Results**

At 6 months postoperatively, the flap remained viable, and the patient was working on range of motion and strengthening with an occupational therapist. Finger and wrist motions rapidly recovered despite extensive soft-tissue trauma, likely the result of the fasciocutaneous flap providing less inflammation and minimal tendon adhesions. The patient was satisfied with the appearance of the flap, which closely mimicked his natural skin tone and hair.

### **Summary**

An ALT free flap is a valuable and versatile tool for the management of complex soft-tissue deficits of the upper extremity. The fascial layer of the flap provides an ideal environment for tendon excursion, and the skin closely mimics the dorsal surface of the forearm.