

Split Latissimus Free Flap Reconstruction of an Exposed Elbow Joint

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Introduction

This video comprehensively describes the surgical technique for split latissimus free flap reconstruction of an exposed elbow joint. The procedure was performed in a 23-year-old woman with multiple injuries during a motor vehicle collision, which left her as a paraplegic. The patient underwent various surgical procedures, including open reduction and internal fixation of bilateral distal humerus fractures, and underwent radiation therapy for heterotopic ossification. Subsequently, a wound and an open elbow joint developed, necessitating free flap reconstruction.

Methods

This video outlines the step-by-step surgical sequence for free flap reconstruction. Surgical preparation of the left elbow, including recipient vessel preparation in the left forearm; free flap and skin graft harvest; free flap transfer to the left elbow; and postoperative management, are explained in detail.

Results

The key surgical maneuvers for this technique involve preservation of the thoracodorsal artery and its descending branch to the lateral muscle while maintaining and neurolysing the thoracodorsal nerve innervation to the remaining medial aspect of the muscle. Transection of the transverse artery branch ensures perfusion of the remaining muscle medially through the secondary segmental intercostal blood supply. In addition, the proximal tendinous aspect of the latissimus attached to the humerus must be retained because this functional muscle aids in preserving adduction, extension, and internal rotation, which are essential in paraplegic patients. The use of a split latissimus muscle flap in this patient population serves multiple purposes and is warranted by specific functional requirements.

Conclusion

The split latissimus free flap reconstruction technique described in this video is effective for addressing the challenge of an exposed elbow joint in a patient who previously underwent extensive surgical procedures and radiation therapy. This procedure helps restore upper limb capability in paraplegic patients by protecting the neurovascular structures and maintaining the functional components of the latissimus muscle.