

Replantation of Upper Arm Amputations at a Level 1 Severe Trauma Center: Considerations for Restoring Elbow Joint Function

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Upper arm amputations often result from high-energy trauma such as wars, traffic accidents, or industrial injuries, typically involving severe soft tissue damage, comminuted fractures, and vascular and nerve injuries. These injuries, particularly at the shoulder or proximal radiocarpal joint, challenge successful replantation due to the complexity of blood vessel anastomosis and nerve repair.

Upper arm amputations are classified based on muscle integrity and nerve function. The four types range from near-detachment with intact muscle-tendon junctions to complete muscle destruction, with some involving joint dislocation. Replantation, while addressing life-threatening concerns, remains a difficult and costly procedure, involving extended surgical times, postoperative complications, and often, patient dissatisfaction with functional outcomes. Despite these challenges, the aesthetic and functional reconstruction achieved by successful replantation can be invaluable.

Post-2000 data indicate survival rates of 94-100% for upper limb replantation, with over 50% reporting functional outcomes of good or better. Advancements in microsurgical techniques, improved anesthesia, and microsurgical expertise have significantly enhanced replantation success, even in cases once deemed contraindicated, such as crush injuries. The importance of elbow joint function cannot be overstated, as it plays a crucial role in hand positioning for daily tasks. Recovery of elbow function, aided by early rehabilitation, is critical to preventing long-term disability.

Maintaining biceps muscle function is essential for optimal elbow recovery, and in cases of nerve damage, reconstructive options such as muscle flaps should be considered. In many cases, secondary surgeries may be necessary for full functional recovery. Ultimately, timely replantation and elbow recovery are paramount for maximizing patient outcomes.