

MICROSURGICAL REPLANTATION OF THE FIRST DIGIT FOLLOWING TRAUMATIC METACARPAL-LEVEL AMPUTATION

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Introduction. Replantation of the first digit is one of the most complex and functionally significant procedures in hand microsurgery, due to its essential role in thumb opposition, grasp, and overall upper limb performance. The thumb contributes substantially to hand dexterity, and its loss severely impacts patient autonomy and quality of life. The success of replantation depends on multiple factors, including the mechanism and level of injury, duration of warm and cold ischemia, as well as the conditions of preservation and transport of the amputated segment. Early surgical intervention and strict adherence to microsurgical principles are crucial for maximizing tissue survival and functional recovery.

Case Presentation. A 59-year-old patient presented to the emergency department approximately two hours after sustaining a sharp traumatic amputation of the first digit at the metacarpal level, caused by an axe injury. The amputated segment was properly preserved and transported in a cold environment without direct contact with ice. Clinical and imaging evaluations confirmed the indication for emergency replantation, with no systemic or local contraindications. The patient was immediately transferred to the operating room. The surgical procedure lasted two hours and thirty minutes, and revascularization of the amputated segment was achieved approximately four hours after injury, which is considered favorable for tissue viability. Surgical management included meticulous debridement, skeletal stabilization, repair of flexor and extensor tendons, microsurgical arterial and venous anastomoses under an operating microscope, and fascicular neuroorrhaphy. Careful layered closure was performed to prevent tension and vascular compromise.

Discussion. The first 7 postoperative days represent a crucial period for the survival of the replanted segment, with vascular thrombosis being the primary early complication. Continuous monitoring of tissue perfusion and appropriate anticoagulant therapy are essential to prevent failure. In this case, the postoperative evolution was favorable, with no vascular or infectious complications, and the patient was discharged after 7 days of hospitalization.

Conclusions. Replantation of the first digit performed within an optimal timeframe and in accordance with microsurgical principles can ensure survival of the amputated segment and satisfactory functional outcomes. Prompt trauma management, proper preservation, and intervention in a specialized center are key determinants of success. This case highlights the importance of multidisciplinary collaboration and microsurgical expertise in restoring hand function and improving long-term prognosis.

Keywords: microsurgery, digit replantation, thumb amputation, ischemia time, vascular anastomosis, functional recovery