

A Novel Method of Fingertip Reconstruction after Zone II or III Amputations

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Introduction: Fingertip reconstruction after tip amputation is a difficult clinical problem with poor treatment options. Here we describe a method of reconstruction in patients with complete zone II or III fingertip amputations that mimics a native fingertip without the need for free flap reconstruction.

Methods: The procedure is completed in three stages. Initially a thenar flap is performed in standard fashion (Fig 1). At division the flap is divided but not inset, and is allowed to heal with local care. In the second stage, an olecranon bone graft is harvested and sculptured into the shape of a key to approximate the shape of a normal distal phalanx. It is placed into the base of the proximal distal phalanx in a peg-in-post fashion, and covered with the thenar flap (Fig 2). The bone is allowed to heal and the skin flap conforms to the shape of the underlying bone. In the third stage, a split nail bed graft is used from the great toe (Fig 3), and further sculpturing of the skin flap is performed if needed.

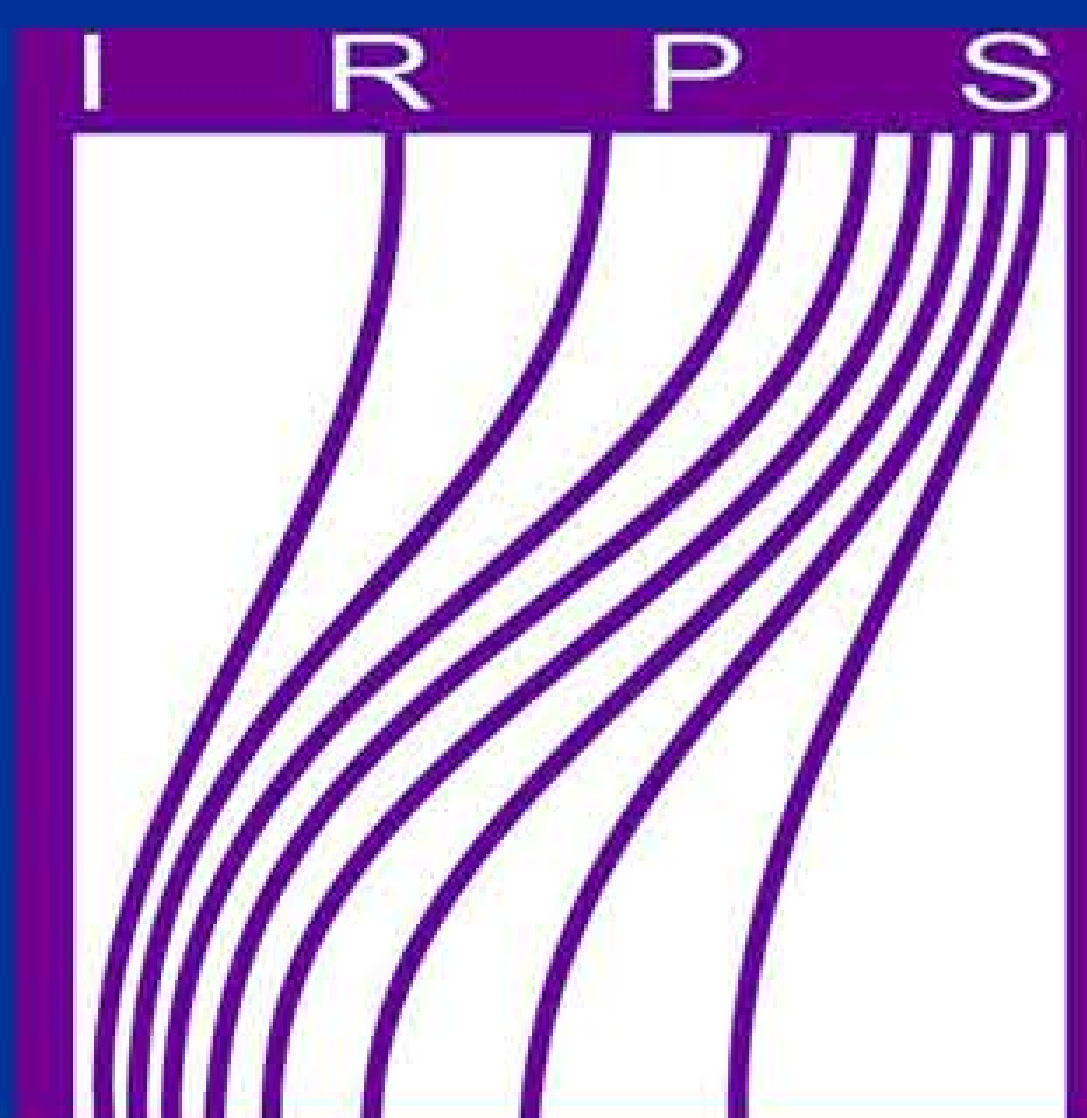


Fig 1. Thenar flap markings



Fig 2. Bone graft with thenar flap



Fig 3. Split nailbed graft

Results: Four patients were treated over a five-year period. The ring finger was most commonly injured (n=3), 3 patients were female, and 1 were male. Average time for completion of all procedures was 3.5 months, with a range of 10 weeks to 6 months. Bony union was achieved in all patients (Fig 4a,b). One patient required a second split nail bed graft. One patient required an additional procedure for additional contouring of the flap. All patients required occupational therapy for range of motion exercises; DIP and PIP range of motion returned to baseline with therapy (Figure 5a, b). Two-point discrimination averaged 8mm, with a range of 6 to 10mm.



Fig 4a. Initial post-operative xray. b. Two-year follow up xray



Fig 5a. Final result



Fig 5b. Full range of motion

Conclusion: This is a novel method of fingertip reconstruction using a local flap and bone graft. This technique restores excellent cosmesis, with creation of a nailbed with adequate bony support. There is minimal donor site morbidity. It is an easily accomplished technique for this difficult clinical problem.



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