



# Reconstruction of the thumb amputation at the carpometacarpal joint level by groin flap and second toe transfer

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## ABSTRACT

**Introduction:** Traumatic loss of thumb at the carpometacarpal (CMC) joint level is very disabling to an individual. Pollicisation is the recommended technique of reconstruction for loss of thumb at this level. On occasions, injury to the rest of the hand or amputation of additional fingers may make pollicisation an impossible option. Microsurgical transfer of second toe is an option in such situations. Although many large series of toe transfers are available in the literature, no series deals exclusively with this subset of patients.

**Materials and methods:** Eight patients who had amputation of the thumb at or proximal to the CMC joint level were reconstructed by second toe transfer by us in the period 2002–2011. All had preliminary groin flap cover in the area of the thumb during the acute stage of treatment. Second toe with the metatarsal was transferred for thumb reconstruction after a mean duration of 3 months after flap cover. Patients were assessed for their ability to pinch, hold large objects and opposition achieved by Kapandji score. Average follow up is 4 years and 6 months with a minimum of 1 year.

**Results:** All toe transfers survived. They reached their maximum functional potential by 1 year. All patients actively used the reconstructed thumb for day to day activities. Pinch was possible in all patients except two patients who did not have any fingers. Six of them registered grip strength of at least 50% of the opposite hand. When fingers were present, opposition was possible in all patients with Kapandji scores ranging from 5 to 8. Extent of usage was less in patients who did not have good function in other fingers.

**Conclusion:** Second toe transfer is a viable option for reconstruction of thumb loss at or proximal to the CMC joint level. Proper planning of the preliminary flap cover determines the length of the thumb reconstruction. Strategic position of the transferred toe of adequate length and the functional status of the other fingers are important determinants of functional outcome.

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## Introduction

Amputation of the thumb at the carpometacarpal (CMC) joint level is very disabling to the individual. The resultant functional disability is graded to be as high as 40% of the hand. Adaptation of the individual following traumatic loss of thumb is more difficult and incomplete than in congenital loss of thumb. Pollicisation is the recommended method of reconstruction for thumb loss at the CMC joint level. In some instances, the trauma which resulted in the amputation of the thumb may in addition cause significant amount of skin and soft tissue loss and amputation of other fingers making option of pollicisation impossible. In such instances, we

need an alternate method of reconstruction. Toe transfer in such instances though technically challenging is probably an option.

Large series of toe transfers to the hands have been published but no series specifically deals with the technical considerations associated with toe transfer for thumb amputation at CMC joint level and their outcome.<sup>1–5</sup> In this article we are presenting our experience of reconstructing eight patients with amputation of the thumb at the CMC joint with second toe transfers with preliminary groin flap cover and the technical considerations which influence the outcome.

## Materials and methods

During the period of 2002–2011 we had eight cases of proximal thumb amputation at or proximal to the carpometacarpal (CMC) joint. Table 1 details the nature of injury, associated injuries, type of soft tissue cover provided, skeletal fixation, tendons, nerves and

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