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## POLLICIZATION OF THE INDEX FINGER IN A LEVEL 4 FACILITY: CASE REPORT

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### SUMMARY

With the advent of microsurgery indications for pollicization of the index finger have decreased. Pollicization, however still, remains a useful technique for thumb reconstruction. We present a case of patient successfully managed by pollicization procedure with good surgical outcome in a secondary level facility.

A forty five year old female patient presented with a one year history of post traumatic amputation of the left thumb. The level of amputation was about 1cm distal to carpal metacarpal joint. Heterotopic transplantation of the index finger was done with index finger proximal phalanx fixed to the thumb metacarpal stump with k wires. Post-operative evaluation at one year of follow up showed good functional outcome.

In conclusions, pollicization as demonstrated in this case remains an elegant reconstructive tool in the plastic surgeon's armamentarium for addressing reconstructive challenges posed by proximal traumatic thumb amputations.

### INTRODUCTION

The thumb accounts to about 40% of hand function. Its reconstruction therefore takes precedence over any other digit. Basic principles in thumb reconstruction include restoration of length, ensuring joints stability and provision of sensation (1). There are a myriad of procedures that could assist in achieving this depending on the level of the amputation, patient and surgeons preference. These include pollicization, toe-to-thumb transfers and osteoplastic reconstructive procedures (1, 2).

Pollicization of the index finger has in recent times fallen out of favor with most emphasis being placed on microsurgical toe-to-thumb transfers (1, 2). However, unique cultural and technical related challenges have led to lack of universal accessibility of toe-to-thumb transfers especially in many countries with limited resources. We present a patient we successfully managed through pollicization of the index finger with good functional and aesthetic outcomes.

### CASE PRESENTATION

A 45 year old female patient presented to us with an injury to the left hand following a road traffic accident a year earlier. Consent was gotten from the

patient to publish this case report. Examination of the injured hand revealed an amputation stump at the base of the right thumb (Figure 1). A radiogram done showed amputation approximately 1 centimeter distal to carpometacarpal joint. The patient was counselled on the possible options of reconstruction including pollicization of the index finger and toe-to-thumb transfer. She opted for a pollicization procedure.

*Figure 1. Patient with amputated right thumb at time of presentation 1 year after injury*



After applying a tourniquet, a small modification of the Buck Gramcko incision was made so as to ensure adequate soft tissue for first web space reconstruction. Neurovascular structures and

tendons were then identified and separated from the metacarpal and proximal phalanx after which osteotomy was done at the base of the proximal index metacarpal bone (Figure 2). The finger was then shortened and fixed to the thumb stump with k-wires with about 120 degrees abduction and 30 degrees extension (Figure 3).

Figure 2. Immediate pre-operative picture of the hand

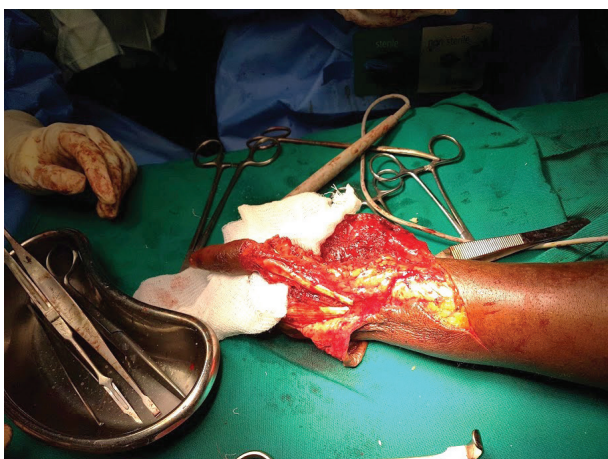


Figure 2. Intraoperative picture of the index finger after osteotomy through metacarpophalanx and creation of an islanded digit pedicle

Figure 3. Early postoperative result day 1 after surgery



Flexor and extensor tendon repairs were done with flexor *digitorum profunda* to flexor *pollicis longus* and extensor *indidis* to extensor *pollicis longus* and extensor *digitorum communis* to abductor *pollicis longus*. Dorsal interosseous muscle was then repaired to the tendon of the adductor *pollicis* and the palmar inserted to the base of the proximal phalangeal joint. The wound was then closed and a dorsal slab applied. K-wires were removed after six weeks and the patient commenced on physiotherapy that involved passive range of movement of the new metacarpophalangeal and interphalangeal joints for four weeks followed by active range of movements till full recovery. The patient was then followed up at a regular interval in the clinic.

Post-operative evaluation at one year of follow up revealed good range of thumb movement with good apposition to all the remaining fingers. The sensory recovery was similar to the other fingers and the patient was happy with the aesthetic outcome (Figure 4). No revision surgery was done.

Figure 4. Outcome at one year of follow up (Figure 4A and 4B)



Figure 4A



Figure 4B

## DISCUSSION

Pollicization of the index has been in practice since the mid-20<sup>th</sup> century after being introduced by Littler *et al.* (3). Primary objective was to achieve a sensate, functional and aesthetical pleasing thumb in reconstruction of total or near total thumb defects. Buck-Gramcko(7) later stretched the indication of this procedure to treatment of congenital thumb hypoplasia (4). With improvement in micro-surgical techniques globally, new techniques such as toe-to-thumb transfer and wraparound flap became more popular relegating pollicization of the index finger to the periphery. Toe to thumb transfer however has an inherent weakness of needing microsurgical techniques and a very demanding peri-operative monitoring of the patients with prolonged length of hospital stay. Wrap around technique on the other

hand requires multiple surgical procedures that often lead to suboptimal results (1,5).

Despite a paradigm shift to micro-vascular based reconstitution, the outcome of pollicization is probably just as good as toe to thumb transfer. Tan *et al* in a comparative study assessing outcomes of toe to thumb transfer and pollicization noted that patients managed with pollicization had early motor and sensory recovery and better range and were better in some activities of daily living (6). Another study by Mochin *et al* found out that pollicization provided superior sensibility, mobility and pinch grasp while toe to thumb transfer had better grasping power. (7)

Our case being a prime case in our unit encountered many challenges. First the patient required a lot of convincing to have the procedure done. Secondly, since we did not have other previous cases, majority of healthcare workers at our institution who interacted with the patient could not comprehend how this procedure could be done and thus ended up discouraging the patient. The surgical team also required to go through some refreshing on how to carry out this procedure. In spite of all the above challenges we still had a good outcome. The patient at one year of follow up was able to use the reconstructed thumb fully. She had normal sensation, good pinch and power grasp and good aesthetic outcome. She was able to return to her occupation at six months post- surgery.

In conclusion pollicization of the thumb is still a good surgical option for thumb reconstruction. It should thus be considered as an alternative to toe to thumb transfer and patients must always be given this option of reconstruction.

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