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Time of return back to work and complications following cross-finger flaps in industrial workers: Comparison between immediate post operative mobilization versus immobilization until flap division

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ABSTRACT

INTRODUCTION: Previous authors have immobilized the injured hand or digits following cross finger flaps.
PATIENTS AND METHODS: About 3 years ago, the author adopted a protocol of immediate postoperative active and passive mobilization (without a splint) following cross finger flap surgery in industrial workers. The current study is a retrospective audit comparing postoperative complications and time of return back to work following cross-finger flaps in two groups of injured industrial workers: Group I (n = 12) had immediate postoperative mobilization; and Group II (n = 12) had immobilization till the time of flap division.
RESULTS: The complication rate was similar in both groups. However, patients in Group I returned to work earlier than those in group II and the difference was statistically significant.
CONCLUSION: Immediate postoperative mobilization following cross-finger flaps in industrial workers does not increase the risk of complications and has the advantage of early return to work.

1. Introduction

Cross-finger flaps are commonly used for reconstruction of complex finger defects. There are three main types of cross-finger flaps. The "classic" flap is harvested from the dorsal aspect of the donor finger to cover a volar defect in the recipient finger [1,2]. In "de-epithelialized" flaps, a flap from the dorsal aspect of the donor finger is de-epithelialized first and is then turned over to cover a dorsal defect in an adjacent finger [3,4]. Cross-finger flaps can also be raised as "adipo-fascial" flaps to cover dorsal or volar defects of adjacent fingers [5]. Regardless of the technique, all previous authors immobilized the hand or the operated digits until flap division. Complete immobilization was employed for 10 days [6,7], 14 days [1,2,8,9] 18 days [10,11], and 21 days [12–17]. One series employed early partial mobilization (the exact details of this partial mobilization were not stated) until flap division at 24 days, at which time full mobilization was started [18].

The author has been the main hand surgeon at an industrial hospital for many years. About 3 years ago, the author adopted a protocol of immediate postoperative active and passive mobilization (without a splint) following cross-finger flap surgery. The following retrospective study compares postoperative complications, the need to refer to physiotherapy, and time of return back to work following cross-finger flaps in workers who had immediate postoperative mobilization versus those who had immobilization until the time of flap division. The case series is compliant with the PROCESS Guidelines [19].

2. Patients and methods

Over the last 3 years, (June 2014–May 2017), twelve consecutive industrial workers (Group I, n = 12) with complex finger defects were treated with cross-finger flaps and immediate postoperative active and passive mobilization (without any splints). One patient had concurrent extensor tendon loss over the middle phalanx and required a tendon graft and k-wire joint fixation across the distal interphalangeal joint. The dressing for this group was a single layer of gauze (applied over the wound only and not circumferentially around the fingers) and loose tape to allow immediate postoperative mobilization (Fig. 1).

We then matched this group with another twelve patients (Group II, n = 12) who had cross-finger flaps and postoperative immobilization until flap division. Matching was done with regards to the site of defect and the donor finger. We also included one matched patient who required extensor tendon reconstruction and k-wire fixation across the distal interphalangeal joint. Matched patients of Group II were operated upon between January 2006 and May 2014.

Systemic co-morbidities were diabetes mellitus (one patient in each group) and hypertension (one patient in each group). These co-morbidities were seen in patients over 50 years of age. In all

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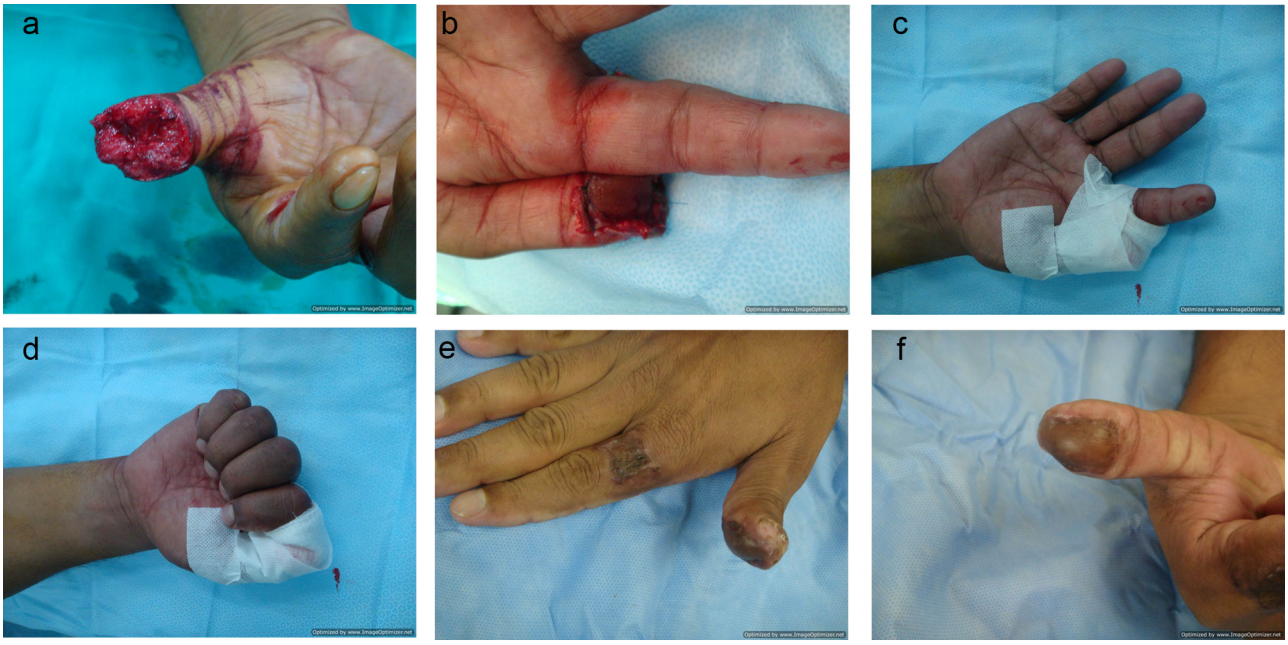

Fig. 1. Immediate postoperative mobilization following a classic flap from the index finger to a thumb pulp defect.
a) The defect
b) The flap
c&d) Mobilization at the first postoperative day. Note the simple dressing without any splints
e&f) The healed wounds

patient, the blood sugar and blood pressure were well-controlled on medications.

In both groups, surgery was performed by the author under local anesthesia or brachial plexus block within 24 h of the injury. Suturing of the flaps was done using 3/0 sutures. Grafting of the donor site was done in classic and de-epithelialized flaps; and grafting of the flap was also required in de-epithelialized flaps. All patients had split-thickness skin grafts. Flap division was done between 17 and 19 days under local anesthesia. The k-wire was removed at 5 weeks in the two patients with extensor tendon reconstruction.

All patients received prophylactic antibiotics: a cephalosporin, one dose before surgery and two doses after surgery. Intravenous paracetamol was used for pain control after surgery; and the use of narcotics was not required in any of the patients. All patients had weekly follow-up in the clinic after the discharge from the hospital.

One of the main determinants of time of return to work is the advice that is given to the patient by the surgeon. The same advice was given to both patient groups. Patients were encouraged to go back to work as soon as they felt they were ready to do so. All patients in our series were covered by compensation. The compensation file was closed by the surgeon and the patient returned to work once full or near-full range of motion was reached. As per the regulations of the "occupational Hazard Group" in our city, "file closure" means that the management of the industrial injury is completed; and the surgeon writes a final medical report detailing any permanent disability and the ability to go back to work. If any injury-related problems arise after returning to work, the worker is allowed to re-open his compensation file for re-assessment and treatment. It is also important to note that regulations and compensations of work-related hand injuries in our country did not change over the years of our study.

The following data were collected retrospectively for both groups: age, sex, site of defect, donor finger, concurrent injuries, type of flap used, time of flap division, postoperative complications (bleeding, infection, flap dehiscence, percentage of skin graft loss, complex regional pain syndrome), and the need for referring the patient to the physiotherapy department. Furthermore, the time of return back to work and the range of motion of the donor and recipient fingers at final follow-up were recorded.

Data was analyzed by using Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Continuous variables were expressed as mean ± standard deviation and categorical variables

Table 1
Data of the two groups of patients in the current study. Group 1 (n = 12) underwent a cross finger flap followed by immediate postoperative mobilization. Group II (n = 12) underwent a cross finger flap followed by postoperative immobilization until flap division.

Parameter	Group I (n = 12)	Group II (n = 12)
Age	21–60 years (mean, 42 years; median, 43 years)	20–58 years (mean, 41 years; median, 42 years)
Sex	All males	All males
Site of defect/donor finger	4 thumb defects (index finger as the donor finger) 2 index finger defects (middle finger as the donor finger) 2 middle finger defects (index finger as the donor finger) 2 ring finger defects (middle finger as the donor finger) 2 little finger defect (ring finger as the donor finger)	Defects/donor fingers were matched to Group I.
Concurrent injuries	One patient with a little finger defect had concurrent loss of the extensor tendon in Zone 2	One matched patient was included in Group II with a little finger defect and concurrent loss of the extensor tendon in zone 2
Type of flap	6 classic flaps, 6 de-epithelialized flaps	6 classic flaps, 6 de-epithelialized flaps