Trial of New Initiative in management of finger tip injury- to enhance the survival of finger stump without microsurgery

Tsang PLC (1), Chan NYG (1), Chiu KWJ(1), Fok M(2), Fung B(2),
(1)Department of Physiotherapy QMH (2)Department of Orthopedics and Traumatology, QMH

Keywords:
negative pressure wound therapy
finger tip injury
finger tip survival

Introduction
Traumatic hand injuries with various severities are not uncommon in Hong Kong. The typical management of these injuries are revision amputation or with flap coverage. Shortening of digit, nail problem or sensory deficit over the fingertip may be resulted. The development of sub-atmospheric negative pressure wound therapy (NPWT) has shown to be effective in various wound conditions. The postulated effects and mechanisms of NPWT are: 1) Reduce peripheral edema; 2) Bacteriostatic effect; 3) Promote granulation; and 4) Improve micro angiogenesis. New initiative of using NPWT was introduced to improve the fingertip survival after debridement

Objectives
To assess the efficacy of using NPWT to “re-vascularize” the finger stump

Methodology
All traumatic fingertip amputations, with or without bone fragment involvement, that were not technically possible for replantation were included. The NPWT of -120mmHg was set up by surgeon perioperative or by physiotherapist after patient was transferred out from operation theatre. Patients could be discharged home with a portable machine when condition became stable. The dressing was changed in physiotherapy department for every 72 hours or when necessary. Active mobilization was encouraged during NPWT. Total duration of NPWT was 7 days. Patient satisfaction, active range of movement of the distal interphalangeal (DIP) joint, sensation, hand grip of the affected digit and survival of fingertip were the outcome measures.

Result
11 digits of 10 patients were recruited in the trial with 7 male and 3 female. The mean age was 44 and 80% of the injuries were involved in non-dominant hand fingertip. All wounds were completely healed within 2 months of dressing without nail problem. The sensation of the fingertips was preserved with minimal hypersensitivity. All of them could resume their work of duty after rehabilitation and over 80% of the DIP joint movement and grip strength were regained as compared to the unaffected side. Although partial tip necrosis was encountered, in general patients had 80% satisfaction with the current management in particular the hand cosmetic. Conclusively, NPWT can be an alternative conservative management that preserves the digit length of a finger with satisfactory outcome; and major operative intervention of patient with large fingertip injury can be avoided.