Hueston local flap in pulp defects repair of the hand. A review of 16 cases

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Pulp defects of hand digits require repairing sensitivity, in particular this of the first three fingers. Hueston local flap technique allows repairing of non-extensive and most oblique defects of fingertips.

During the last five years we were exploring different possibilities for local repair of small defects with distal sliding of palm skin. In our report we discuss Hueston technique in 16 cases. We emphasize on possibilities to improve results of original method.

In 1966 J. Hueston with L-shaped incision modelled a volar skin flap based on mediolateral line of the digit. The flap is formed including neurovascular bundle from the opposite of the incision side. With asymmetrical sliding to distal primary defect is covered. Hueston suggests free skin graft to cover a new formed, after flap rotation, triangular defect or healing by secondary intention. In our practice we met two problems: A. Unrestored sensitivity in marginal area of the flap. B. Covering of the new formed triangular defect. To make gripping with injured fingertip effective and with good sensitivity the line of flap rotation has to be situated on functional side of the digit. R. Souquet recommends a combination of the Hueston and O'Brien technique - the local flap includes both radial and ulnar neurovascular bundles. In this way sensitivity is restored in all areas of the flap. Disadvantage of this method is a restriction of skin sliding. To avoid unsatisfactory healing of the after-rotating defect, Tanzer and Gillis recommend a local triangular flap, modelled behind vertical branch of L-incision. After 90° rotation this flap covers the secondary defect. The main flap covers donor place with a little traction in dorsalward. Our experience in using Tanzer and Gillis technique in thumb defect repair shows that most of the patients were complaining from cool intolerance and paraesthesia. We consider that these complaints are caused by decreasing circumference of the thumb after second flap rotation. Argamazo recommends flap from index skin in covering the proximal thumb defect. But crossing the first interdigital space could affect on thumb function.

We suggest our technique for distal thumb defect repairing. Primary flap includes both radial and ulnar neurovascular bundles. And two more flaps from thenar eminence skin are modelled - ("figural flaps") to cover triangular defect after the main flap rotation. Defect is
covered by changing the places of these "figural flaps" and covering skin is with very similar structure. We have not noticed functional complications like in techniques mentioned above.

Duration of follow-up checkings in presented series is at least six months. Average sliding of the neurovascular skin flap was 10 mm with a maximum in one case - 17 mm. A restriction of extension in interphalangeal joint is noted in 5 patients which arise of the necessity of rehabilitation. We achieved significant results in sensitivity repair of injured fingertip and esthetical outcome, too. Using this technique we have not observed any other complications.

Hueston flap is indicated in pulp defects of the thumb and the other digits. It can be used both in central or oblique injuries of fingertip. Disadvantages of original technique are avoid in Souquet's modification - sensitivity is restored in all areas of the flap. Most complications can be minimized and a good clinical outcome can be achieved using our modification where the problem of covering the proximal skin defect after main flap rotation is satisfactorily solved.