Hand reconstruction using thigh, groin and lateral thorax flaps.

A systematic review, have we found the ideal flap for hand reconstruction?

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Abstract

Background:

Reconstruction of the hand is a challenging topic. Bearing in mind the unique structure of the hand, simple wound reconstruction was never satisfactory for both patients and surgeons.

Objectives:

In this systematic review, we focus on appraising the current practice in order to answer our proposed question, Have we find an ideal reconstruction technique for the hand?

Methods:

A literature review was carried out using OVID, Cochrane and google scholar.

Results and Conclusion:

37 relevant articles were included for discussion.

Many reconstruction approaches were described, some were proven reliable. However standardisation of the approach and management was not elicited. Management differed hugely according to surgeon's preference and experience along with available facilities and logistics.

Introduction:

The complex and unique hand anatomy and function created an outstanding challenge to achieve a satisfactory reconstruction outcome.[1, 2]

Not only the defect reconstruction was aspired, but also the function, the appearance and sensation were targeted.[3, 4] The introduction of the functional free tissue transfer (FFTT) took the hand reconstruction ahead in achieving satisfactory function restoration.[5, 6] When bony framework was insulted, the bone graft and vascularized bone transfer reconstruction achieved a robust skeleton to achieve a desirable outcome. Using sensate flaps for hand reconstruction fulfilled the sensation dilemma in a reconstructed hand and achieved the protective sensation necessary for the hand function.[7] With the new advances and introducing the perforator flaps, thin skin and adipofascial flaps were used for reconstruction of the hand with very pleasant appearance. Hence, addressing the concern of the bulkiness issue in the reconstructed hand. [8, 9] Furthermore , using LASER for hair ablation in the flaps provided a reasonable solution for the problematic appearance of a flap with a hair bearing skin in a non-hair bearing areas.[10]

Taking hand reconstruction further, more recent reports reported

successful complex hand reconstruction in a single stage. Putting the classic concept of staged reconstruction into question.[3,9]

So, clearly, reviewing the current literature shows that this is where we stand now in hand reconstruction.

However, our question still stands; do we have the ideal hand reconstruction technique? Do we have the gold standard flap for each indication?

That is what the following lines will try to highlight through extensive current literature review and analysis.

Limitations:

The current documented practice in hand reconstruction literature shows well-described operative techniques, but, unfortunately, lacks unified guidelines or systematic approach the hand reconstruction. It, instead, shows variable protocols that were proved reliable, but mostly based on individual experience and preference [1]. The documentation was not always available with regards to the facilities and logistics availability and its impact on the decision making in the reconstruction pathway. Moreover, patient related factors such as: existing co- morbidities, age, occupation, hobbies, handedness and preference was not widely documented as well.[7] Preoperative work up e.g., CTA, Duplex scans…etc. And how their results affected the reconstruction options is another thing that was not clearly mentioned in some of the papers.[9]
All these limitations contributed to limit the ability to extract a gold standard approach for hand reconstruction

METHODS:

Using OVID interface, google scholar and Cochrane, literature search carried out.

Key words: Hand resurfacing, Hand reconstruction, Mutilated Hand Mangled Hand, in both abstracts and titles.

Lay out was adherent to PRISMA 2009 guidelines and BEST BETS principles.

RESULTS

37 articles were included.

Inclusion criteria:

Literature in English language.

Lateral thorax, groin and thigh flaps only were included.

Mangled and mutilated hand along with post burn and post oncho-surgery reconstruction were included.

Outcome criteria included, function outcome, patient satisfaction, need for secondary surgery, need for salvage procedure, cosmetic appearance and protective sensation restoration.

Exclusion Criteria:

Non-flap based hand reconstruction (Skin graft).
Non- lateral thorax, thigh and groin flap reconstruction.
Primary Amputation.

37 Relevant articles were included and discussed with analytic critique to conclude a systematic approach to ideal hand reconstruction.

- Outcome of literature review of groin, thigh and lateral thorax donor sites flaps for Hand reconstruction.

-	Skin	Sensate	Tendon	Bone	Pedicle	Donor insult	Aesthetic	Patient satisfaction
Groin	Bulky	+	-	-	Pedicle	Acceptable	Poor	the hand is attached to the groin for average 3 weeks
SCIP	Thin	+	-	-	Short super microsurgery	Acceptable	Poor	fair
DCIA	Thin	+	-	+	Reliable	Moderate	Fair	Fair
ALT	Thin	+	-	+	Excellent	Acceptable	Good	Fair
Gracilis	Thin	+	+	-	Reliable	Acceptable	Fair	Opposition Restoration
TFL	Bulky	+	+	+	Reliable	Acceptable	Poor	Fair
TDAP	Thin	+	-	+		Minimal	Good	Fair

- Literature review-based Suggested Indications of Groin, Thigh and Lateral Thorax flaps in hand reconstruction

Skin only	ALT, TDAP	Thin skin, Minimal donor insult, reliable anatomy, sensate
Skin+minimal bone defects	ALT, TDAP, DCIA, TFL	ALT. TDAP with muscle componenmt and fascia to obliterate dead space and help with gliding DCIA, TFL have more donor site insult
Skin+large bony defects	DCIA	The whole Iliac crest can be harvested.

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