

# Pushing the Boundaries of Salvage in Mutilating Upper Limb Injuries

## Techniques in Difficult Situations



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### KEYWORDS

- Bilateral upper limb amputation • Free functioning muscle transfer • Flow through free flap
- Toe transfers • Mutilating hand injuries

### KEY POINTS

- Even in most severe injuries of the upper limb, with the current available reconstructive armamentarium basic function can almost always be restored.
- In multilevel digital amputations, heterotopic replantation and rearrangement of parts can result in useful function.
- Even in most severe combined injuries with tissue loss of the proximal upper limb, if the hand is structurally intact it is worth salvaging. Free functioning muscle transfer can restore useful function.
- The more the mutilation, the more the conservation of parts. Salvage of skeletal segments and joints may prove useful in subsequent reconstruction particularly in bilateral injuries.
- Multistaged reconstruction is almost the rule. Timing and sequence of the procedures are key to success.

### INTRODUCTION

When a surgeon is faced with a mutilated upper limb, the goal of management is to aim to obtain as good a functioning upper limb as his or her surgical experience and imagination can envisage. At times, a variety of factors, including the severity of the injury, will thwart this goal and the bar must be lowered to obtain, at the very least, enough basic function to enable the individual to perform the basic activities of living and lead an independent life. In the authors' opinion, this can always be achieved by surgeons with experience in this field.

In the acute situation and, sometimes later, particularly if circumstances force a lowering of the bar, the question arises: salvage or amputate? Unlike with the lower limb under these circumstances, there are no validated and acceptable scoring systems to guide the surgeon dealing with complex upper limb injuries. At present, the bias should always be toward salvage because the alternative means rehabilitation with a prosthesis and upper limb prostheses remain far from ideal.<sup>1–5</sup> For the lower limb, prostheses have a simpler task and work well. Not so with our current upper limb prostheses.<sup>6–8</sup> However, more

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