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Case Report

Reconstruction of high voltage electric burn wound with exposed shoulder joint by thoracoacromial artery perforator propeller flap

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ABSTRACT

We describe the reconstruction of high voltage electric burn injury with exposed shoulder joint by thoracoacromial artery perforator propeller flap based on the delto-pectoral perforators of thoracoacromial artery. The successful use of this propeller flap to cover the exposed shoulder joint in a case with limited local flap options demonstrates its use as an alternative technique.

KEY WORDS

Exposed shoulder joint; perforator in deltopectoral groove; reconstruction; thoracoacromial artery perforator propeller flap

INTRODUCTION

The exposed shoulder joint should be covered immediately as delaying this may result in injury to capsule, rotator cuff including leakage of synovial fluid, etc. To prevent these complications the joint should be covered with a flap. Numerous methods of reconstruction are available to the plastic surgeon, all having their respective advantages and disadvantages. When such injuries are combined with loss of local soft tissue, the task becomes even more uphill. We present a case of high voltage electric burn wound with exposed shoulder joint which was reconstructed by using the thoracoacromial artery perforator propeller flap.

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CASE REPORT

A 25 year old male with high voltage electric burn injury was admitted with the complaints of raw areas on the left upper arm with exposed shoulder joint [Figure 1]. The patient was a manual labourer by occupation and the sole earning member of his family. On examination there was a raw area over shoulder and arm along with exposed

Figure 1: The defect with exposed shoulder joint

shoulder joint. It was decided to cover the exposed shoulder joint by a local flap and rest of the raw areas to be skin grafted.

Flap anatomy with operative details

Doppler study was done prior to surgery to locate the position of perforator in the deltopectoral groove. The surgery was performed under general anaesthesia. Territory of the flap marked [Figure 2]. Dissection of the flap done over deltopectoral groove and the perforators present there are identified [Figure 3]. Then flap is raised along its entire margin. Flap is completely islanded around the perforator for better reach of the flap [Figure 4]. Suturing of the flap was done to the margin of a defect around the shoulder joint. Rest of the raw areas over lateral arm and the donor site of flap covered with split thickness skin graft [Figure 5] and light compressive dressing along with limb splint age was done. In the Immediate post-operative period venous congestion of flap was encountered. A few flap insetting sutures were removed and immediately the colour of flap improved. 2 days later flap margins were resutured. It has been 12 months since surgery and the patient is satisfied with the results [Figure 6].

DISCUSSION

Pedicle latissimus dorsi flap is commonly employed for covering exposed shoulder joint but its use affects glenohumeral function, which is undesirable in a patient with a weak shoulder from an underlying pathologic condition.[1] A perforator is a vessel that has its origin in one of the axial vessels of the body and that passes through certain structural elements of the body, besides interstitial connective tissue and fat, before reaching the subcutaneous fat layer.[2] Deltoid branch of thoracoacromial artery gives rise to a cutaneous perforator in the mid portion of the deltopectoral groove.[3] As per Tokyo consensus in 2009, the flap used for reconstruction of an exposed shoulder joint is a propeller flap and the nomenclature

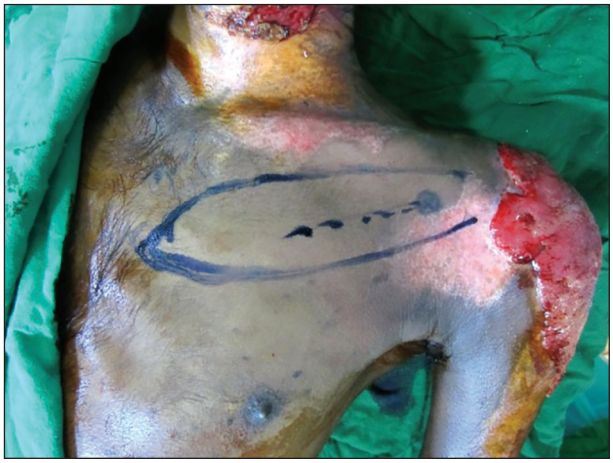

Figure 2: Territory of thoracoacromial artery perforator propeller flap

Figure 3: Perforator of thoracoacromial artery in deltopectoral groove identified

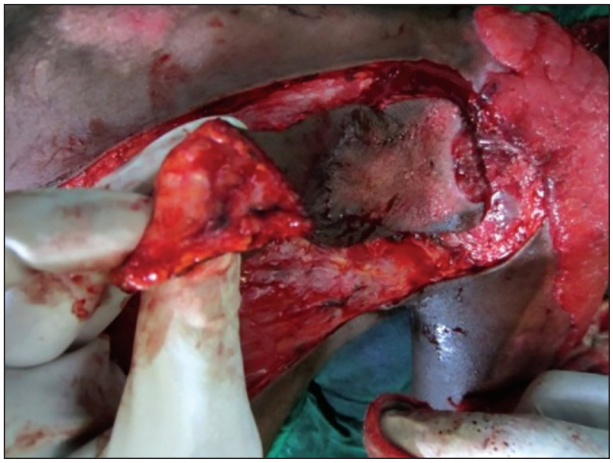

Figure 4: After complete islanding of flap, presence of dermal bleed

Figure 5: The rest of raw areas were covered with SSG

Figure 6: Post operative photograph (3 Month Post-Op)

of the flap should be based on nourishing pedicle or the artery of origin of the perforator.[4] As the pedicle of the described flap is the deltopectoral perforator of thoracoacromial artery, flap is named as per the consensus as the thoracoacromial artery perforator propeller flap.

Pre-operative doppler study and exploring incision to locate the perforator has to be undertaken prior to elevation of the flap. If there is an absence of a sizable perforator, other flap options should be undertaken. There is a possibility of flap loss when the defect is located beyond the standard arc of rotation causing excessive tension on the vascular pedicle. Defect size beyond the vascular territory of the flap pedicle may result in either an inappropriate increase in flap dimension or excessive flap tension at the inset site.[5] In our case, that was the cause for congestion in the immediate post-operative period, which was properly managed in time.

SUMMARY

We have found the thoracoacromial artery perforator propeller flap to be simple and expeditious to harvest. It provides for single stage resurfacing of complex defects over shoulder joint. It appears an effective alternative for covering defects around shoulder joint by providing an improvement in skin colour and texture match and enhanced reliability. Availability of this flap option for a defect around shoulder joint should be considered ideal since it gives coverage of identical tissue deficiency, available adjacent to the defect without sacrifice of any muscle thus minimizing morbidity. Initial delay before final flap elevation may be helpful as there was flap congestion in this case. This flap option should be kept in mind, and should be explored for small to medium size defects around shoulder.

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