Coverage of complex defects of the shoulder girdle and posterior neck triangle following tumor resection

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A B S T R A C T

INTRODUCTION: Numerous pedicle and free flaps have been used to cover complex defects of the shoulder girdle and posterior neck triangle following tumor resection. We describe our choice of flap selection in these patients with case examples.

PRESENTATION OF CASES: Three cases examples demonstrate our choice of flap selection. In the first case, an anterior shoulder girdle defect is covered by an anteriorly transposed latissimus dorsi muscle flap. The second case demonstrates the coverage of a posterior shoulder girdle defect by a posteriorly transposed latissimus dorsi muscle flap. Finally, the third case demonstrates the coverage of a posterior neck triangle defect using a superiorly transposed pectoralis major muscle flap. All reconstructions utilize muscle flaps (covered by split-thickness skin grafts) and not myocutaneous flaps.

DISCUSSION: We demonstrate that these two pedicle muscle flaps are adequate for coverage of large complex defects of the shoulder girdle and posterior neck triangle. We also demonstrate the advantages of using muscle rather than myocutaneous flaps.

CONCLUSION: Pedicled latissimus dorsi and pectoralis major muscle flaps are simpler and preferred over free flaps for coverage of complex defects of the shoulder girdle and posterior neck triangle. The use of muscle rather than myocutaneous flaps will reduce the size of the original defect, make flap design easier and reduce donor site morbidity.

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1. Introduction

Numerous pedicle and free flaps have been used to cover complex defects of the shoulder girdle and posterior neck triangle following tumor resection [1–8]. However, the literature does not offer any choices of flap selection in these cases. Over the last two decades, we have followed our personal approach for flap selection; which is based on the site of the defect. Anterior and posterior shoulder girdle defects are covered with pedicle latissimus dorsi muscle flap transposed anteriorly and posteriorly; respectively. Defects of the posterior neck triangle are covered with pedicle pectoralis major flap transposed superiorly. Although we have the microsurgical expertise, we have never utilized free flaps in these cases because we believed that pedicle muscle flaps would provide adequate reconstruction. Furthermore, we always utilized these pedicle flaps as muscle rather than myocutaneous flaps. We have been happy with the reconstructive outcome and we continue to use these two flaps in our practice.

In this paper, we demonstrate our choice of flap selection with three case reports. We also emphasize the advantages of using muscle and not myocutaneous flaps in these patients. The work has been reported in line with the SCARE criteria [9].

2. Presentation of cases

2.1. Case 1: coverage of an anterior shoulder girdle defect

A 16-year old boy presented with Ewing sarcoma of the clavicle. Resection resulted in a large anterior shoulder girdle defect (Fig. 1a). A pedicle latissimus dorsi muscle flap was transposed anteriorly to cover the defect (Fig. 1b). A split-thickness skin graft was then applied over the muscle. The post-operative course was uneventful and all wounds healed well (Fig. 1c and d). Despite the clavicular resection, the functional result of the shoulder was excellent (Fig. 1e–h).

2.2. Case 2: coverage of a posterior shoulder girdle defect

An 18-year old female presented with soft tissue sarcoma invading posterior shoulder girdle (spine of the scapula). Resection...
2.3. Case 3: Coverage of a posterior neck triangle defect

A 70-year-old female presented with recurrent squamous cell carcinoma (post-resection and radiotherapy) of the skin of the left posterior neck triangle (Fig. 3a). Although these were no motor or sensory defects of the brachial plexus, there was plexopathy and pain secondary to radiotherapy to the area of the brachial plexus. Following resection (preserving the brachial plexus), the defect was
Fig. 2. Coverage of a posterior shoulder girdle defect.

a) The tumor in the upper back.
b) The defect after tumor resection.
c) The latissimus dorsi muscle has been transposed and the donor site is being closed.
d) A close-up view of the latissimus dorsi flap covering the defect.
e) The headed skin graft and donor site.
covered by a pedicle pectoralis major muscle transposed superiorly (Fig. 3b). The muscle was covered with a split-thickness skin graft (Fig. 3c). The postoperative course was uneventful and all wound healed well (Fig. 3d). There were no motor or sensory deficits and pain score (out of 10) improved from a score of 6 pre-operatively to score of 1 at final follow-up 3 years later.

3. Discussion

Our literature review did not reveal any suggestions of any choices of flap selection for coverage of complex defects of the shoulder girdle and posterior neck defect after tumor resection. Our approach (mentioned in the introduction) is demonstrated in the case reports and utilizes only two pedicle muscle flaps: the latissimus dorsi and pectoralis major muscles. Although there are many different flaps around the shoulder girdle that could be utilized for reconstruction [1–6], we prefer these two muscles because they are large (defects created post tumor resection are generally large in size) and reliable. Furthermore, the donor site morbidities for these two muscles are known to be minimal [10,11]. We have always utilized our pedicle flaps as muscle rather than myocutaneous flaps. We believe that the use or pure muscle flaps has three main advantages. Firstly, the thin-split thickness skin graft applied over the muscle flap will undergo significant secondary contraction resulting in significant reduction in size of the defect (compare the preoperative Figs. 1b and 2b to the postoperative Figs. 1c and 2c). It is important to note that this size reductions does not compromise functions since the defect is away from the axilla.

Secondly, harvesting the flap as a myocutaneous flap will increase the donor site morbidity; and in large defects, the donor site will need a skin graft. Finally a pure muscle flap does not need special design of a cutaneous component to exactly fit into the defect after transposition.

4. Conclusion

Pedicle latissimus dorsi and pectoralis major muscle flaps are simpler and preferred over free flaps for coverage of complex defects of the shoulder girdle and posterior neck triangle. The use of muscle rather than myocutaneous pedicle flaps will reduce the size of the original defect, will make flap design easier, and will reduce donor site morbidity.

Conflict of interest

None.

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Ethical approval

The study was approved by the Research Committee of National Hospital (Riyadh Care), Riyadh, Saudi Arabia.

Consent

Written informed consent was obtained from the three patients for publication of this case report. A copy of the written consent is available for review by Editor-In-Chief of this journal on request.

Authors contribution

All authors contributed significantly and in agreement with the content of the manuscript. One author did the literature review and other authors participated in data collection.

Guarantor

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