A Technique to Maximise Length of Pectoralis Major Muscle Myocutaneous Flap Pedicle in Orofacial Reconstruction

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Abstract *Introduction* Pectoralis muscle flap is one of the most common regional flap used in orofacial reconstruction. Mobilization of pedicle and reach of the skin paddle is a technical consideration. *Method* Based on the anatomical difference in blood supply to clavicular and sternal head, we elaborate a technique to maximise the length of pedicle in maxillofacial reconstruction. *Conclusion* The proposed technique is reproducible and reliable and possibly increase the indications of usage of the flap.

Keywords Pectoralis major muscle · Clavicular and sternal head · Thoraco acromial artery

Introduction

Pectoralis muscle flap a decade ago the work horse flap of head and neck reconstruction, Even in the era of free flaps One of the versatile flap for head and neck reconstruction. The length of the pedicle limits the degree of rotation of the flap and the distance that the flap can be transferred. For head and neck reconstruction, the highest point that it can reach is the zygomatic arch (Fig. 6) [1].

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Anatomy

The pectoralis major muscle is composed of the clavicular and sternocostal heads. The thoracoacromial arterial trunk arises from the second part of the axillary artery and pierces the clavipectoral fascia. It has four branches: acromial, humeral, clavicular, and pectoral. The clavicular branch supplies the clavicular head of the pectoralis major muscle. The pectoral branch skirts medial to the pectoralis minor muscle and descends on the deep surface of the sternocostal portion of the pectoralis major muscle and serves as its main blood supply. The lateral thoracic artery, which also arises from the second part of the axillary artery, follows the lateral border of the pectoralis minor muscle and supplies the lateral part of the pectoralis major muscle.

Rationale for this Technique

After harvesting the myocutaneous flap, the whole pectoralis major muscle together with the skin paddle is turned upwards to the head and neck region. The muscle lying over the clavicle will produce a prominent bulge (Fig. 7a). The bulkiness of the flap at this point has disadvantages; the swelling, besides being unsightly, limits the mobility of the pedicle, although, with time, it will atrophy. The vessels running on the muscle bulk may be stretched when the muscle swells in the early postoperative period. The muscle bulge also reduces the distance the flap can be transferred [2]. This can be avoided by the technique described below.

Technique

Skin paddle marked and flaps raised. Sternal and clavicular head detached from humeral attachments (Fig. 1). Pectoral

pedicle identified. As the blood supply of the clavicular and the sternocostal heads are separate, the two heads can be separated by dissecting along the groove between the two heads (Fig. 2). The origin of the pectoral branch as the pedicle of the flap can be identified in the groove and preserved on the deep surface of the sternocostal head. The clavicular head can be divided along the axis of the pedicle (Fig. 3a and b) and the muscle fibers will retract, producing a triangular gap (Fig. 4) to allow the positioning of the pedicle of the flap when turned upward to the head and neck area (Fig. 5). With the elimination of the muscle bulk

formed by the clavicular head (Fig. 7b), the stretching of the pedicle is reduced and the length of the pedicle is also increased by 4–6 cm. The mobility of the myocutaneous flap is also enhanced so that the tension exerted at the skin paddle is reduced (Figs. 6, 7). The above technique is illustrated in Fig (8a and b).

Fig. 1 Detachment of clavicular and sternal heads of pectoralis muscle

Fig. 4 Triangular space created after resection of clavicular head

Fig. 2 Dissection in the groove between clavicular and sternal head

Fig. 5 Transfer of flap in the space created after cutting clavicular head

Fig. 3 a and b Clavicular head resected

Fig. 6 Mobilization of the myocutaneous flap till the level of zygomatic arch

Fig. 7 **a** Conventional method of transfer with a bulge visible. **b** Proposed method with clavicular head resected with no visible bulge

Fig. 8 **a** Conventional method of muscle transfer. **b** Proposed method of transfer

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