*British Journal of Plastic Surgery* (1980), 33, 145–149
0007-1226/80/0033014580$02.00


# A DYNAMIC RECONSTRUCTION OF A FACIAL DEFECT WITH A PECTORALIS MAJOR MYOCUTANEOUS FLAP

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The surgical reconstruction of major defects of the cheek such as those following cancer surgery or accidental injury, is usually performed using static components (McGregor and Reid, 1970). Recent developments in microsurgery and particularly the use of the myocutaneous flap, have introduced a new dimension in the dynamic reconstruction of facial defects (Manktelow, 1979).

We have successfully used the latissimus dorsi neurovascular myocutaneous flap as a free flap for dynamic facial reconstruction in 2 patients with cheek defects (Maruyama *et al.*, 1979).

However, the reconstruction by microvascular anastomosis is a somewhat complicated and time-consuming procedure and free flap transfer has not yet proved to be thoroughly reliable, as its success always depends on two small vessel anastomoses.

We present a patient in whom a pectoralis major neurovascular pedicled myocutaneous flap was successfully transferred to fill a soft tissue defect of the cheek and combined with a selective neuro-anastomosis to provide dynamic muscle action.

## CASE REPORT

A 52-year-old woman received extensive facial injuries as the result of a road accident. Her initial resuscitation and treatment was carried out at another hospital. The wounds were excised, a fracture of the right zygomatic complex stabilised by transverse pinning and the wounds closed by a split skin graft.

She was transferred to us 4 months later (Fig. 1A). She could not close the right side of her mouth and presented marked ectropion of the right lower eyelid, due to contracture of the skin graft and lack of subcutaneous soft tissue padding.

Preoperative electromyography revealed no motor unit in the skin grafted area (Fig. 2A).

**At operation.** The original skin graft and all the scar over the right cheek was excised to re-establish the true cheek defect. (fig. 1B).

A skin incision was made just lateral to a line drawn from the acromion to the xiphoid and the pectoral fascia was incised. By manual blunt dissection, the pectoralis major muscle was elevated off the chest wall.

Three neurovascular bundles could be identified along the posterior surface of the pectoralis muscle (Fig. 1C).

The skin over the pectoralis muscle was incised to provide a flap sufficiently wide to cover the facial defect. As the dissection proceeded proximally great care was taken not to damage the three neurovascular bundles.

A nerve stimulator was used to select the most suitable nerve for subsequent neuro-anastomosis.

The nerve was then divided and dissected under microscopic magnification over a distance of about 20 cm.

The myocutaneous flap was then transferred to the facial defect. The pectoral nerve was

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then anastomosed to a prepared buccal branch of the facial nerve by epineural suture using 10/0 nylon (Fig. 1D).

The pectoralis muscle was sutured to the temporal fascia and the overlying skin was closed in two layers. The muscle pedicle was temporarily covered with meshed split skin graft. A week later, the two other neurovascular bundles and half of the muscle pedicle were divided and separated. Two weeks after the first operation, good circulation in the flap was confirmed by fluorescein injection while the pedicle was clamped (Fig. 1E).

The remaining segment of the pedicle was cut. The muscle was divided into two portions which were inserted into the upper and lower lip (Fig. 1F and G).

The patient's postoperative course was completely uneventful at every stage (Fig. 1H).


FIG. 1. A. Preoperative view to show the facial deformity and ectropion of the right lower eyelid. B. The original defect has been recreated by surgical excision of all the scar. There is no muscle and very little residual fatty tissue in the right cheek.

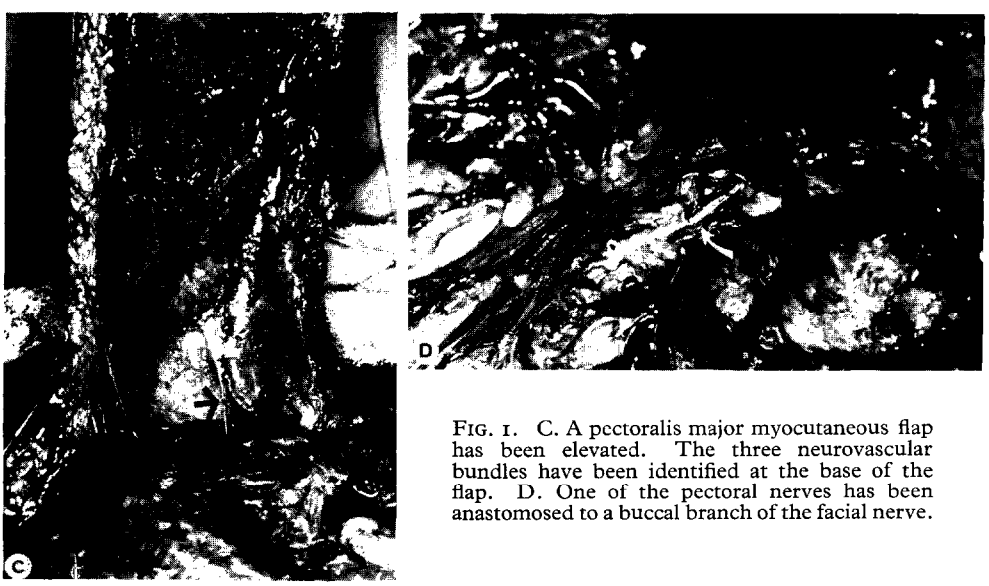


FIG. 1. C. A pectoralis major myocutaneous flap has been elevated. The three neurovascular bundles have been identified at the base of the flap. D. One of the pectoral nerves has been anastomosed to a buccal branch of the facial nerve.

FIG. 1. E. A good circulation in the flap was confirmed by injection with the pedicle clamped. The pedicle was then safely divided.

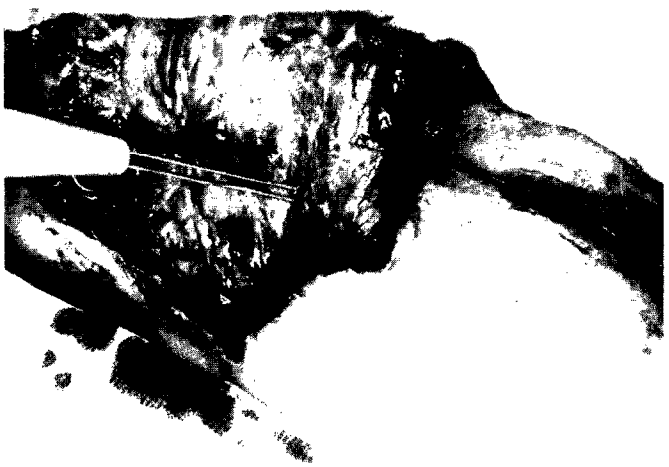

FIG. 1. F. Good bleeding was observed from the cut end of the muscle.



FIG. 1. G. The muscle was divided into two slips which were inserted into the upper and lower lip. A full thickness skin graft taken from excess skin on the pedicle was applied to the lower eyelid and the inset of the skin flap was completed. H. Result 3 months later: some further adjustments to the flap will be required.

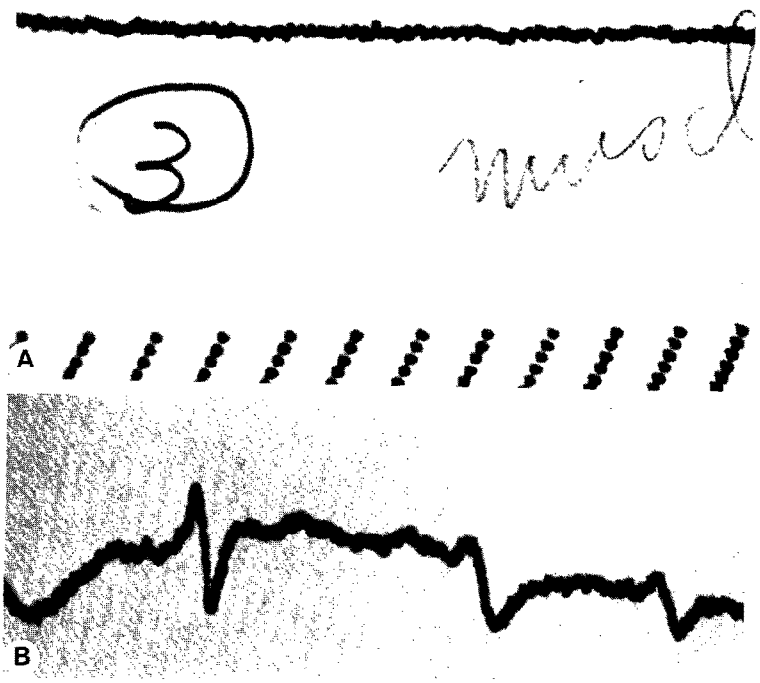


FIG. 2. A. Preoperative electromyography shows no activity in the right cheek. B. Electromyography three months after operation shows some low voltage spikes with delayed latency time, suggesting reinnervation of the grafted muscle.

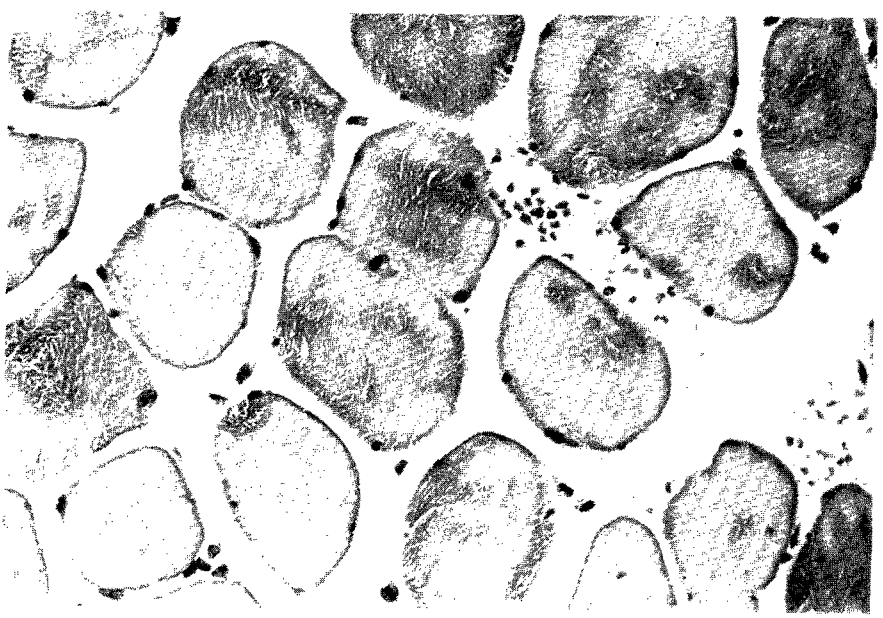

FIG. 2. C. A muscle biopsy taken 2 months after operation shows normal muscle-fibre with only slight variation in fibre. (x 100)

## Discussion

The pectoralis major myocutaneous flap has been described by several authors (Hueston and McConchie, 1968; Ariyan, 1979; Maruyama *et al.*, 1978) and its advantages reported in detail. Anatomically this compound flap is a consistently "surgically safe" unit though its feeding vessels (the thoraco-acromial artery and vein) and the motor nerve (lateral pectoral nerve) show occasional anomalies. In four other cases using the pectoralis muscle, we found a constant pattern of three main neurovascular bundles. Care must be taken in choosing the correct motor nerve and the use of a nerve stimulator is mandatory.

Three months after the operation on our patient, electromyography showed some low voltage spikes with delayed latency at the time of stimulating the trunk of the facial nerve. This finding suggested some reinnervation of the grafted muscle (Fig. 2B).

Recently, reports of the use of free muscle grafts with neurovascular anastomosis have indicated that muscle contraction increases gradually to its maximum level within 8 to 10 months (Fig. 2C).

In our clinical studies of free myocutaneous flap transfers with neurovascular anastomosis, electromyography has revealed that the maximum muscle contractions were observed 7-8 months after surgery.

A muscle biopsy taken 2 months postoperatively in our patient, revealed almost normal muscle fibre structure, but some variation in size (Fig. 2C).

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