

cause a further rise in methaemoglobin to a dangerous level.

This rare case raises several important general points. The first is to remember an abnormal haemoglobin in the differential diagnosis of a 'blue baby' when there is no obvious respiratory or cardiac cause. The second is not to disregard apparently incorrect investigations, in this case the arterial blood gas value, without a good explanation. The third is the importance of a good clinical history and observant examination.

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Reconstruction of the anterior lower third of the face using a composite pectoralis major free flap

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A new option for mandibular symphyseal reconstruction is presented.

Case report

A 46-year-old man presented with local recurrence of a malignant fibrous histiocytoma involving the chin. Eight months prior to this he had undergone a right partial mandibulectomy and neck dissection followed by right ramus reconstruction using a non-vascularized iliac bone graft. Despite histological clearance with negative nodes the soft tissues and underlying bony symphysis of the mandible were involved, extending across the midline. No palpable lymphadenopathy or distant disease was found.

A second radical resection was performed including a skin excision centred over the symphysis measuring 10 cm × 10 cm, further mandible extending round to the left lower premolars and a mucosal excision of floor of mouth and buccal sulcus, in continuity, measuring 6 cm × 3 cm.

The reconstruction comprised a left pectoralis major free flap, including two paddles of skin and 14 cm of the underlying fifth rib, again in continuity. The rib was osteotomised into three parts and plated on the inner aspect to reconstruct the mandibular defect. The left end of the rib was screwed to the remaining stump of the horizontal ramus of the left mandible, with the other end free in the scar tissue of the bed of the previous unsuccessful iliac bone graft. The two skin paddles were inset in layers to provide new lining and skin cover.

The pectoral branches of the thoraco-acromial axis with a pedicle length of 15 cm were anastomosed end-to-side to the external carotid artery and external jugular vein in the left neck. The donor defect was covered with a split skin graft.

The patient made an uneventful recovery with little discomfort. He was discharged home on the tenth post-operative day with good speech, swallowing and a satisfactory

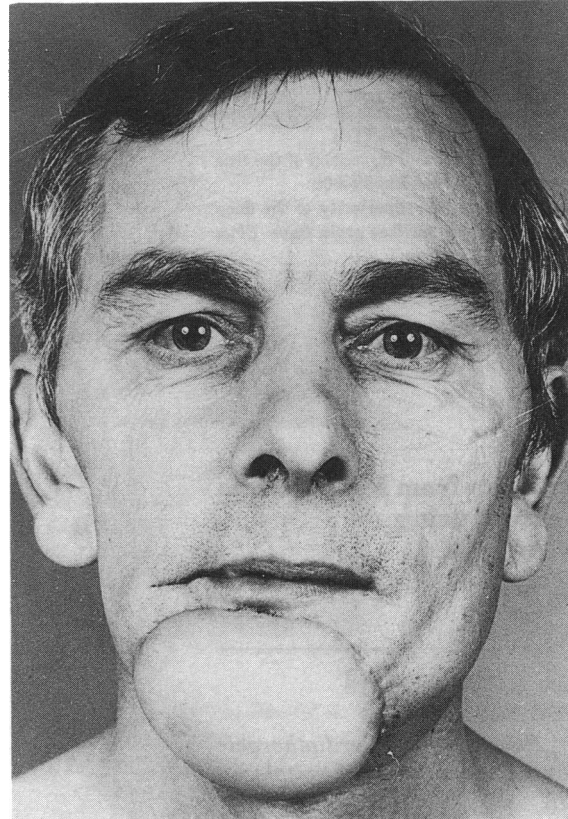


Figure 1. A-P of mandibular reconstruction using a free osseomyocutaneous pectoralis major flap with a segment of 5th rib at 9 months following surgery (with permission from the patient)

aesthetic result. At 9 months the appearance continued to improve (Figure 1).

Discussion

Mandibular symphyseal reconstruction remains a major challenge. It must provide a platform on which to support a dental prosthesis and a chin prominence to contour the overlying soft tissue.

Synthetic materials as well as autogenous bone all have their advocates. In view of our previous problems with a free graft and the implied unfavourability of the bed a composite vascularized flap including rib was undertaken. This is accepted to have a better chance of survival and hence union in such conditions¹.

There are several options for such a composite reconstruction²⁻⁸. Free transfer of rib based on the posterior⁹ and anterior¹⁰ intercostal vessels has also been documented, but not without significant risk. Reid *et al.*¹¹ reported free tissue transfer of the clavicular head of pectoralis major for mandibular reconstruction. However, the pedicle was short and the skin paddle of limited size.

The advantages of using the sternal head of pectoralis major with rib are the better quality and length of bone,

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easily identifiable vessels of the thoraco-acromial axis with good calibre¹², and a convenient donor site allowing two teams to operate synchronously.

The disadvantage of this reconstruction, especially in women, is its bulk due to the volume of muscle and fat. Historically, when used as a pedicled flap to reconstruct such defects there were significant problems with rib survival. Studies have now shown a rich anastomosis¹³ between the pectoral and periosteal vessels overlying the third, fourth and fifth ribs but not the sixth which was commonly used for such pedicled reconstructions.

Such a free osseomyocutaneous flap with two skin paddles has not been previously reported.

In conclusion we would suggest that such a flap offers a simple dissection with good calibre vessels of generous length, associated with ample good quality bone.

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Successful resuscitation from hypothermic induced cardiac arrest using cardiopulmonary bypass

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The mortality of patients who develop hypothermia has been reported to be in excess of 80% at core temperatures between 24° and 35°C¹⁻⁴. The prognosis of those who have sustained cardiac arrest is extremely poor unless they can be rapidly rewarmed. We describe a case where cardiopulmonary bypass facilitated the successful resuscitation of such a patient and discuss its merits.

Case report

A 58-year-old man was arrested for being drunk and disorderly on a cold December morning and was placed in police custody in the recovery position. Two hours later he was found to be pulseless and cyanosed by a Police Surgeon. Effective cardiopulmonary resuscitation did not commence for a further 10 min until the arrival of cardiac trained ambulance crew who rapidly confirmed that the patient was in fine ventricular fibrillation.

On arrival at a neighbouring Casualty Department his wet clothing was removed and his core temperature was recorded

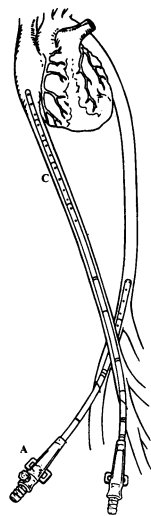


Figure 1. Femoral artery (A) and femoral vein (B) cannulation using dilator cannulae. Note the position of the tip femoral venous cannulae within the right atrium (C)

to be 29°C. He was managed according to the guidelines of the UK Resuscitation Council but after 45 min he remained in refractory ventricular fibrillation and he was therefore transferred to an adjacent cardiothoracic unit for rewarming on cardiopulmonary bypass. It proved possible to place the patient very rapidly on femoro-femoral bypass using a percutaneous Seldinger technique with dilator cannulae sizes 17 and 21 as the patient's femoral artery was free of disease (Figure 1). After 10 min rewarming and supportive bypass to a core temperature of 30° the patient was successfully restored to sinus rhythm following a single direct current shock; after a total of 103 min bypass, with flows of up to 2.2 l/min, he was readily weaned from cardiopulmonary bypass requiring moderate inotropic support. He was electively ventilated overnight during which time the inotropes were discontinued. His recovery was complicated by sternal paradox secondary to prolonged external cardiac

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