PECTORALIS MAJOR TRANSPLANT WITH ARTHRODESIS OF THE SHOULDER IN A CASE OF INJURY TO THE UPPER TRUNK OF THE BRACHIAL PLEXUS

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J. M. P. Clark (1946) was the first to transplant the pectoralis major, in a soldier with the biceps brachii and coraco-brachialis completely destroyed by gas gangrene. The result was good. A few cases of this graft have since been reported; Seddon's (1949) is the largest series, with sixteen operations.

CASE REPORT

The patient, aged thirty-eight years, was a sub-inspector of police. He sustained a spear wound of the left side of the neck about eight months before, with immediate inability to use the corresponding shoulder and elbow though movements of the hand were unimpaired. He had complete paralysis of the spinati, deltoid, clavicular head of pectoralis major, biceps, brachio-radialis and supinator brevis. The range of passive movement was full at the elbow and shoulder.

Arthrodesis of the left shoulder was performed with the arm abducted 40 degrees, flexed 30 degrees and laterally rotated slightly. Internal splinting with a Smith-Petersen nail was used in addition to external splinting with a plaster-of-Paris spica, which was removed after six and a half weeks to facilitate pectoralis major exercises.

Nine weeks later a pectoralis major transplant was carried out. The origins from the fourth, fifth and sixth ribs and the adjoining part of the sternum were detached; the
corresponding piece of muscle and an attached strip of separated rectus sheath was freed from the upper part of the chest as high as the axilla, with preservation of the medial pectoral nerve. The transplant was rerouted subcutaneously and stitched to the biceps as far distally as possible. The elbow was kept flexed 40 degrees beyond a right angle for three weeks.

Six weeks after the second operation the elbow could be extended to 110 degrees, flexed to 35 degrees, supinated 80 degrees, and pronated fully, and the patient could bend it while holding a weight of 7 lb. (Figure 1 shows 3 lb.)

DISCUSSION

Of other operations for weakness of the elbow flexors, Steindler’s proximal displacement of the medial origin of the forearm flexors provides too little power in cases of complete paralysis; there are obvious objections to posterior bone block, and especially to arthrodesis of the elbow.

When arthrodesis of the shoulder is necessary also (as in the present case), it should precede the transplant lest the shoulder spica hinders the re-education of the muscle. Clark used only the digitation arising from the sixth rib, but it appears better to use a larger part of the muscle. Our graft did not reach the tendinous part of the biceps—a difficulty which would be avoided by leaving a strip of rectus sheath two inches long attached to the graft. Seddon has advocated the use of bipolar electrical stimulation in defining the medial pectoral nerve, but its size is such that it could hardly be missed in careful dissection. In post-operative re-education of the muscle, faradism is infrequently needed with an intelligent and co-operative patient. Flexion of the elbow is at first always accompanied by adduction of the shoulder, but with a little practice the two movements are soon dissociated.

REFERENCES
