RADIAL-MEDIAN ANASTOMOSIS*

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WHEN the function of a median nerve is lost, the sensory deficit usually proves to be a greater handicap than the motor loss. The difference in functional value between sensory and motor components of the nerve is most evident when the nerve has been interrupted distal to the proximal third of the forearm. In this circumstance the long muscles of the forearm are still innervated and active. Although some of the intrinsic muscles of the hand are paralyzed, trick and supplementary movements of the muscles that are supplied by the ulnar nerve tend to minimize the motor disability. But the total and permanent loss of sensation over index finger and tip of thumb is a serious symptom.

Any large unselected group of cases of median nerve injury will usually include a small number in which there is no way of effecting a satisfactory secondary suture. Of 67 cases of median nerve injury resulting from war injuries, which were treated at Shaughnessy Hospital Neurosurgical Center, there were 4 cases in this category. Three of these patients, as well as an earlier civilian patient, have been treated by anastomosis of the superficial radial nerve with the distal portion of the median nerve.

There is scant reference to this procedure in medical literature. A case was recorded by Harris in 1921. Harris reported that by 11 months after operation, pin prick sensation was apparent over all of the median area except for a small portion of the tip of the index finger. Pollock and Davis in their authoritative text on nerve injuries, mention radial-median anastomosis briefly and dismiss the procedure as "unsatisfactory." No reference has been found to any group of cases that have been treated in this manner.

The superficial radial nerve is entirely sensory and its severance does not result in any disability. Mobilizing this nerve and the distal portion of the median nerve, just above the wrist, is an easy exercise in anatomy. The only troublesome part of the operation for anastomosis of the two nerves arises from the discrepancy in size, for the median is at least three times the size of the superficial radial. In an attempt to overcome this difficulty, 3 of the 4 cases which are herein reported, were anastomosed by plasma, following the method of Tarlov.

TECHNIQUE

(Fig. 1) Incision commences 3 cm. proximal to the wrist over the palmar tendon, extends laterally just beyond the lateral border of the radius and then turns back in a flat curve to reach the middle of the forearm over the

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medial border of brachioradialis muscle. The flap of skin is reflected. The superficial radial nerve is identified lateral to the tendon of brachioradialis. The nerve usually divides into two branches of equal size about 5 cm, above the styloid process of the radius. The identity of the superficial radial nerve is established with certainty by following it under the brachioradialis. It is mobilized, transected just proximal to its point of branching and then transposed to lie along the medial border of the brachioradialis tendon. Just above the wrist the medial border of the flexor sublimis projects toward the radial artery beneath the flexor carpi radialis, as a fibrous sheet. This sheet of tissue is opened by a longitudinal incision alongside the radial artery and lifted up along with the flexor carpi radialis and the flexor sublimis tendon to expose the median nerve. The nerve is transected 8 cm. above the wrist and moved over so that it lies in the trough between brachioradialis and flexor carpi radialis. In this trough, on a bed formed by the radial extension of flexor pollicis longus, the anastomosis is performed. When anastomosis is completed it is covered by lightly tacking over the fibrous sheet which was first incised alongside the radial artery.

Tarlov's small latex rubber mold holds the two nerve ends very well and can be manipulated without undue difficulty in this location. Plasma can be prevented from leaking out around the smaller radial nerve by tucking a small strip of muscle around this nerve so that it will fit the mold. Placing a couple of preliminary sling sutures to hold the nerve ends opposed while they are being placed in the mold, is a frustrating procedure, because of the discrepancy in their size. A more satisfactory alignment can be obtained, however, with plasma union, than with the conventional sutures.

CASE REPORTS

Case 1. K. W., age 16, civilian, in June, 1943, suffered severe laceration of the anterior surface of his right wrist, with severance of the median nerve. In February, 1944, a surgeon, who shall be nameless, radically resected the neuromata (because they were tender) without attempting secondary suture. After this mutilation the resultant neuromata were widely separated.