PARALYSIS OF THE ULNAR NERVE AND MANAGEMENT OF ITS DEFORMITY
WITH SUGGESTION FOR TEMPORARY PARTIAL BLOCKAGE DURING RECOVERY

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PARALYSIS of the ulnar nerve has been more frequent and unfortunately the results of suture of this nerve have given less gratifying results than in any other peripheral nerve. Reasons for this are: (1) the ulnar is a mixed motor and sensory nerve carrying different types of nerve fibers, (2) distal innervation is to small highly specialized muscles for the finer movements of the hand, (3) another reason may be the poor blood supply of the nerve which may be further impaired by anterior transplantation of the nerve.

The functional return of a useful hand should be the objective when confronted with an ulnar nerve paralysis. This may be obtained by neurorrhaphy or by a combination of primary nerve repair followed by tendon transfers for deficient regeneration. In either case we must preserve the parts of the hand that are essential for function. An innervated, but stiff hand is useless. Steps must be taken to preserve muscles, joints and soft tissues in a state of mobility.

It seems to the writer that mechanical splintage of paralyzed joints must follow more closely the anatomical and physiological characteristics of a part. The prevention of muscle stretching is important, but the joint structures on which the muscle acts must also be considered; namely, the ligaments, joint capsules and soft tissues. For example, tight skin about a joint can vitiate completely normal nerve-muscle-joint mechanism.

Paralysis of the ulnar nerve sparing the nerves to the flexor digitorum profundus muscle presents a deformity of the hand that is not seen when the lesion is above the elbow. Phylogenetically, the muscles innervated by the ulnar nerve are oldest and more highly co-ordinated than those supplied by other peripheral nerves. This nerve is peculiar by supplying muscles at different levels in the extremity, but which co-ordinate for fine hand movement involving identical joints. An active flexor digitorum profundus muscle sets in motion the platform of origin of the lumbrical muscles. The latter, however, have their insertion upon the dorsal expansion of the metacarpophalangeal joint.

Paralysis of the ulnar nerve above the elbow, producing a flail state of all the muscles supplied by this nerve, causes a minimal deformity of the hand. However, a lesion below the elbow sparing the innervation of the
flexor digitorum profundus produces an unequal pull on the “a” joint of the little and ring fingers. The deep flexors to these digits flex the interphalangeal joints. The lumbrical muscles initiate the arc of flexion in the “a” joints. When the latter are paralyzed, this joint is tipped into extension by the extensor tendon. This position is maintained by the continuous pull of the active flexor digitorum profundus muscle. Apparently, an active lumbrical muscle is the key to a neutral balance between extension and flexion of the metacarpophalangeal joint. Though less noticeable, the same pattern of deformity is present in median nerve paralysis if the lesion is distal to the innervation of the deep flexor muscles to digits 2 and 3. If the median nerve alone is paralyzed, the intact interossei help maintain the balance. However, a combined ulnar and median nerve paralysis gives rise to the claw hand. This deformity is produced by the same mechanism.

An obvious and interesting fact of ulnar nerve paralysis is that the deformity associated with lesions below the elbow is greater than that with