Multiple (Median, Ulnar, Radial and Medial Antebrachial) Nerve Injury Associated with Brachioplasty

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Brachioplasty is a common plastic surgery procedure used to excise the lax skin of the arm. Complications associated with brachioplasty include nerve injury.¹ The medial antebrachial cutaneous nerve is the most common nerve injury encountered with brachioplasty.¹ Injury to other nerves is uncommon.^{1,2} To the author's knowledge, postbrachioplasty multiple (median, ulnar, radial and medial antebrachial) nerve injury has not been previously reported. The author presents a case and discusses the etiology and management.

A 43-year-old, otherwise healthy, female underwent bilateral brachioplasty. There was over-resection of the skin on the left side. This was realized and managed by deep fascial plication to minimize the skin defect. The maximum tension was in the lower arm. Hence, the skin in that area was left slightly open, and the skin edges were held with tension sutures in that open area. Immediately after the surgery, the patient had paresthesia in the hand along the ulnar, median, and radial nerve distribution. There was no motor weakness or hand edema, and the treating surgeon decided to treat this conservatively. The patient was discharged home the next day. Over the following week, there was progressive motor weakness of the hand. The author was urgently called for further management. Examination showed a tense arm with tension sutures across the small skin gap in the lower arm (►Fig. 1). There was no distal hand edema and distal pulses were normal. Elbow flexion/extension was intact. Sensory examination of the forearm showed complete loss of sensation along the distribution of the medial antebrachial cutaneous nerve. Examination of the hand showed almost complete high-ulnar nerve palsy as well as partial palsy of the median and radial nerves (►Table 1). An urgent nerve conduction study showed that the sensory nerve action potentials were absent for the ulnar nerve and reduced in amplitude for the median and radial nerves. After an informed consent, the patient was taken to the operating room on same day of the consultation, undergoing release of the entire incision. The deep fascial plication sutures (across the medial inter-muscular septum) were released. Once released, it became apparent that part of

the deep fascia has been excised from the distal two-thirds of the arm (►Fig. 2). The biceps and triceps muscle bellies appeared pink and stimulated well with cautery. Complete release of the ulnar nerve along the arm and cubital tunnel was done. Cubital tunnel release was done without extending the incision to the forearm, which was aided with the use of a lighted retractor. The radial and median nerves were also identified and released along their courses in the arm. None of these three main nerves had a focal lesion, indicating that the deep fascial plication sutures did not catch any of nerves. The medial antebrachial nerve was found to be transected in the middle third of the arm, and the distal segment of the nerve was missing. The distal 3 cm of the incision (at the elbow) and the proximal 5 cm of the incision (at the axilla) were closed under no tension. The remaining incision was left open. The wound was dressed daily, and it eventually healed by secondary intention after 10 weeks. After the surgical release, there was gradual improvement of nerve function. Median and radial nerve functions returned back to normal at 3 weeks postoperatively. Recovery of the ulnar nerve was much slower. At final follow-up, 9 months after surgery, there was persistent mild weakness of the hand intrinsic muscles.

Our case is unique because of the involvement of all three major nerves of the limb, and this was probably related to a compartment syndrome of the arm secondary to the deep fascial plication. Migliori et al³ reported on one patient with acute postoperative ulnar nerve compression with moderate sensory/motor deficiencies. Immediate release of the skin sutures relieved the symptoms. The open wound was later treated with sequential delayed closure. Wolf and Kuhlmann⁴ also reported on one patient who developed severe edema of the arm and severe isolated ulnar nerve dysfunction, requiring surgical decompression and neurolysis. Thawani et al⁵ reported on a patient with persistent but mild median/ulnar nerve dysfunction at 10 months after brachioplasty. The motor power was only slightly affected for both nerves. The sensory deficiency was mild in the ulnar nerve distribution and severe in the median nerve distribution.⁵

Fig. 1 Appearance of the wound at 9 days after the brachioplasty procedure, just before surgical decompression

Fig. 2 Intraoperative view after release of the skin incision and nerve decompression. Note the exposed triceps muscle and the missing deep fascia along the lower two thirds of the arm. The arrow points to the released ulnar nerve.

Table 1 Ulnar, median, and radial nerve examination just prior to surgical release

Nerve	Sensory/motor examination of the nerve
Ulnar nerve	<ul style="list-style-type: none"> –Subjectively absent sensation with unobtainable two-point discrimination along the ulnar nerve distribution –Clawing with no intrinsic muscle function –Extremely weak function of the flexor carpi ulnaris and flexor profundus of the ulnar two fingers (MRC motor score of 3)
Median nerve	<ul style="list-style-type: none"> –Subjectively, the patient scored sensation as 5 out of 10 along the median nerve distribution. Moving two-point discrimination was 6 mm in the thumb –Weak thumb opposition (MRC motor score of 4) and weak long flexor function of the median nerve (MRC motor score of 4)
Radial nerve	<ul style="list-style-type: none"> –Subjectively, the patient scored sensation as 7 out of 10 along the distribution of the radial nerve –Weak wrist/digital extension (MRC motor score of 4)

Abbreviation: MRC, Medical Research Council.

Note: MRC motor power scale: 3 is active movement against gravity, 4 is active motion against gravity and resistance, 5 is normal power.

Appropriate early management of major nerve injury associated with brachioplasty is mandatory. Mild paresthesia in the hand may be watched carefully for any persistence or

progression, and most cases resolve spontaneously within a week. Patients with persistent or moderate symptoms should be treated with immediate release of the skin incision and this usually solves the problem.³ Finally, patients with acute severe symptoms should be treated immediately not only with respect to release of the skin incision but also decompression of the involved nerves.⁴

Conflict of Interest

None declared.

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