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Musculocutaneous nerve injury after coracoid process transfer for clavicle instability

Report of three cases

During the last 10 years, we have treated 54 cases of fracture or dislocation of the lateral clavicle by transposing the coracoid process onto the clavicle. Recently, a postoperative musculocutaneous nerve injury was observed in 3 cases, all of which recovered spontaneously within 5 months. Our technique seems to entail a certain risk of causing stretch injury to the musculocutaneous nerve. Apart from resting the affected arm for a month or two, the condition does not require specific treatment.

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Introduction

Musculocutaneous nerve injury distal to the innervation of the coracoid-brachialis muscle is characterized by weakness of the biceps and brachialis muscles and sensory loss in the distal forearm. The condition is extremely rare. In the last 2 years, we have seen 3 cases of isolated musculocutaneous nerve injury following transposition of the coracoid process onto the clavicle. This surgical approach has been used in the treatment of fracture or dislocation of the lateral clavicle in 54 cases during a period of 10 years. We describe the clinical features of our 3 cases.

Case reports

Case 1. A 32-year-old man, while playing basketball, fell onto his right shoulder and sustained a fracture of the lateral third of the clavicle. The fracture was openly reduced, and the position was maintained by transposing the coracoid process with its muscular attachments onto the clavicle. A deep-wound infection developed postoperatively, but resolved following antibiotic treatment. Six weeks later, wasting of the biceps brachii was observed. EMG examination of the right biceps showed abundant positive waves and fibrillation potentials with only a few voluntary motor-unit action potentials. Three months later, function and EMG were normal.

Case 2. A 27-year-old man had received a direct blow to his right shoulder that resulted in an acromioclavicular dislocation. Six weeks after open reduction, active movements were begun. Over the next few weeks the patient noticed gradual weakness of his right biceps. Examination showed muscle atrophy. EMG of the right upper extremity was normal except for moderate positive waves and fibrillations in the right biceps and brachialis muscles. The patient was advised to discontinue physical activities, and 4 weeks later there was no weakness of his right upper extremity.

Case 3. A 31-year-old man had fallen directly on his left shoulder with acromioclavicular dislocation. Three months after the operation, he complained of weakness of his left elbow flexion. Physical examination disclosed atrophy of the left biceps muscle and loss of sensation in the left volar forearm. EMG showed positive waves and fibrillation in both the biceps brachii and brachialis. The patient was told to avoid vigorous activity, and 2 months later sensory and muscle function and EMG were normal.

Discussion

In the treatment of lateral fracture of the clavicle and acromioclavicular dislocation, we use a surgical procedure that utilizes the muscular action of the biceps and coracobrachialis to stabilize and maintain the fractured/dislocated clavicle in place (Katznelson et al. 1975, 1976). Cases of postoperative musculocutaneous nerve injury have been reported (Randall & Claire 1978) to be due to positioning of the upper extremity in abduction, external rotation, and extension during general anesthesia. This position can stretch both the

musculocutaneous nerve and the coracobrachialis muscle. The musculocutaneous nerve normally comes off the lateral cord and sends one branch to innervate the coracobrachialis; the main nerve trunk goes directly through this muscle. After sending a branch to the biceps and brachialis, the nerve continues its course down the forearm as the lateral antebrachial cutaneous nerve. In the approach that we used, the transposition of the coracoid process with its attached muscles probably caused stretch injury of the musculocutaneous nerve at the site of its passage through the coracobrachialis muscle (Dundore & Delisa 1979). Apparently the condition heals spontaneously.

References

Dundore, D. E. & DeLisa, J. A. (1979) Musculocutaneous nerve palsy: an isolated complication of surgery. *Arch. Phys. Med. Rehabil.* **60**, 130–133.

Katznelson, A., Nerubay, J., Oliver, S. & Friedlander, C. (1975) Dynamic repair of acromio-clavicular dislocation. *Acta Orthop. Scand.* **46**, 199–204.

Katznelson, A., Nerubay, J. & Oliver, S. (1976) Dynamic fixation of the avulsed clavicle. *J. Trauma* **16**, 841–844.

Braddom, R. L. & Wolfe, C. (1978) Musculocutaneous nerve injury after heavy exercise. *Arch. Phys. Med. Rehabil.* **59**, 290–293.