Median Nerve Palsy after Fracture Shaft of Humerus: A Case Report

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Abstract

A humeral fracture is the most likely fracture to be associated with nerve injury. Approximately 12% of fractures of the shaft of the humerus are complicated by immediate radial nerve paralysis. Fractures of the humeral shaft associated with median nerve palsy are exceedingly uncommon because it is protected throughout its course from direct contact with bone by muscles of varying thickness. Here we report the case of a young man who sustained a fracture at the junction of middle 1/3rd and distal 1/3rd of the humeral shaft associated mainly with median nerve palsy.

Key Words: Median nerve palsy, Fracture shaft of humerus, Denervation, Radial Nerve.

Introduction

Fractures of the humeral shaft associated with median nerve palsy are exceedingly uncommon. A review of the literature revealed that on rare occasions median nerve palsy is associated with fractures of the distal third of the humerus, especially in children. We report the case of a young man who sustained a fracture at the junction of middle 1/3rd and distal 1/3rd of the humeral shaft associated mainly with median nerve palsy.

Case report

A 21-year-old man sustained a compound grade I fracture at the junction of middle 1/3rd and distal 1/3rd of the left humeral shaft after a motorcycle crash. He has 0.5 cm compound wound on anterior aspect of left arm. He was transferred to the nearest hospital from where he was referred to our hospital for further treatment. On physical examination, swelling and deformity was present in left arm along with compound wound as described above. He also had denervation of the flexor pollicis longus and flexor digitorum profundus to the index finger with no clinical evidence of dysfunction of the remainder of the median nerve (pronator teres, abductor pollicis brevis). The ulnar and radial nerves examination was normal. There was sensory deficit only in autonomous area of median nerve (Fig. 2). According to the patient’s history, the dysfunction of thumb and index finger were present immediately after the injury. On x-ray examination, the proximal fragment of the humerus was displaced posterolateral, whereas the distal fragment was displaced anteromedial (Fig. 1). The fracture was reduced and immobilized in a U-slab. Patient was later undergone surgery and closed reduction and TENS was done. Based on the nerve injury, which was limited mostly to motor fibers only, we thought that the possibility of nerve laceration or entrapment was very remote. Therefore, we decided not to explore the median nerve and to observe the patient frequently both clinically and radiologically.

At the end of the first month, a functional brace was applied to the arm and an electromyograph revealed signs of serious denervation of all muscles innervated by the median nerve, including the pronator teres and signs of mild denervation of the extensor digitorum communis. There was also a remarkable slowness of the motor conduction of the median nerve below the elbow. The study concluded that the neural damage was compatible with injury to the median nerve above the origin of the branches for the pronator teres, together with mild injury to the radial nerve.

At the end of the second month, a solid union of the humerus was obtained. The neural function showed improvement at 3 months with full recovery at 5 months.

Discussion

A humeral fracture is the most likely fracture to be associated with nerve injury. Approximately 12% of fractures of the shaft of the humerus are complicated by immediate radial nerve paralysis[1]. On the contrary, the injuries of the median nerve with fractures of the humeral shaft, are extremely unusual obviously, because it is protected throughout its course from direct contact with bone by muscles of varying thickness. Macnicol[2] reported a case of median nerve palsy after a
A humeral shaft fracture in a 10-year-old girl after a fall from a pony. The majority of median nerve injuries are associated with fractures of the distal third of the humerus, especially in children [1, 3-5]. Regarding our case, the most apparent clinical finding was the palsy of the anterior interosseous nerve. The isolated injury of the anterior interosseous nerve constitutes a well-established complication in supracondylar fractures of the humerus [4,6]. Moreover, because the anterior interosseous nerve supplies motor branches only to the flexor pollicis longus and flexor digitorum longus to the index, these motor deficits may not be appreciated unless they are specifically evaluated [4,7]. Sunderland (1978) has been able to isolate fibers destined to become the anterior interosseous nerve as far proximal as the brachial plexus. These fibers proximal to the humeral epicondylar line are grossly concentrated along the posterolateral aspect of the nerve. The specificity of the motor loss without sensory loss, as in our case, makes partial median nerve injury secondary to contusion unlikely. In contrast, it is believed that the mechanism for producing the paralysis is traction [6]. The explanation is that the deforming force acts maximally on the posterior surface of the nerve trunk where the nerve fibers innervating these muscles are concentrated at this level [8]. The final outcome in our case was favorable, and we would recommend conservative treatment as the best method for such an injury.

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