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## CASE REPORT

# ANTERIOR DISLOCATION OF SHOULDER WITH BRACHIAL PLEXUS INJURY

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### ABSTRACT

Brachial plexus injury secondary to anterior dislocation of the shoulder is unusual injury. This is a case report of brachial plexus palsy following traumatic anterior dislocation of shoulder. Recovery took 6 months and patient was left with residual shoulder stiffness. A brief review of presentation and management of this condition is also presented.

**KEY WORDS:** *Anterior shoulder dislocation. Brachial plexus injury trauma.*

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## INTRODUCTION

The shoulder is the most commonly dislocated joint following trauma. Males are affected far more frequently than females especially adolescents and young adults under 25 years of age.<sup>1</sup> Anterior dislocation of the shoulder is the most common form of shoulder dislocations, but the association of brachial plexus palsy with anterior shoulder dislocation is not very common.

The first study about brachial plexus injury in association with shoulder dislocation was published in 1910 by Delbit and Cauchoix<sup>2</sup> in which they pointed out involvement of infraclavicular plexus with favourable prognosis. Laa *et al.* reported nerve injury in 45% of patients following primary shoulder dislocation and humeral neck fractures, most often involving the axillary, suprascapular and musculocutaneous nerves.<sup>3</sup> Elderly patients and those with haematoma have higher incidence of nerve palsy.<sup>3</sup>

## CASE REPORT

A 32 years old female patient was brought to the accident and emergency department following a motor vehicle accident with complaints of severe pain in right shoulder and inability to move the right upper limb. On arrival, the patient's vitals were stable, but she was in considerable distress. Physical examination found the right shoulder held in abduction and external rotation with loss of normal shoulder contour. Any attempted passive movements were resisted and painful. Initially, full neurological assessment was not possible as patient was not co-operative due to pain, however, right wrist drop and diffuse sensory deficit was present. The radial pulse was well felt. Patient was prescribed intravenous tramadol for pain control. Radiographs of right shoulder confirmed the clinical diagnosis of anterior shoulder dislocation. The dislocation was reduced by axial traction and counter traction under sedation and collar and cuff was applied. Check radiographs of right shoulder confirmed reduction without any associated fractures.

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Patient underwent repeat neurological examination. The motor power was 2 in shoulder abduction, 2 in elbow extension and flexion, 0 in wrist extension and 3 in wrist flexion. Sensory examination revealed paresthesia from C<sub>5</sub> to T<sub>1</sub> in right upper limb. This assessment was consistent with diffuse brachial plexus injury. Patient's right wrist was immobilized in cock-up splint and she was admitted for further evaluation. Cervical spine examination and radiographs were normal. After two weeks, physiotherapy was started for passive mobilization of right upper limb. After 5 weeks, there was not much improvement in motor grading with persistent patchy paresthesia. Nerve conduction and electromyography studies confirmed right brachial plexus injury possibly at multiple levels with right radial nerve palsy. Five months after injury, patient had returned to her household work with completely recovered wrist extension, elbow flexion and extension. However, there was residual shoulder stiffness and exact neurological assessment around shoulder was not possible.

## DISCUSSION

Brachial plexus injury following shoulder dislocation are typically postganglionic, infraclavicular and occur in continuity.<sup>1</sup> The mechanisms of brachial plexus injury are diverse. The mechanisms could be stretching at the time of injury, compression by haematoma and/or direct trauma by the humeral head. Entrapment of nerves during reduction of the dislocation is also possible. The lesion is usually neuropraxia or an axonotmesis. Complete lesions have poor prognosis. Neurologic deficit usually recover within 4–6 months. Electromyography may be useful in follow-up.<sup>1,3</sup> From review of the literature, no conclusion can be drawn about the general incidence of brachial plexus lesion associated with dislocation of the shoulders. Watson-Jones<sup>4</sup> reported 15 cases of shoulder dislocation complicated by axillary nerve palsy, two of them permanent. In shoulder dislocation, traction on the brachial plexus is exerted laterally at a point relatively far from the anatomical anchorage to the spinal cord, so the elasticity of nerve roots helps to protect them from severe damage. Most of the traction force is borne by the infraclavicular plexus; the axillary nerve is the branch nearest to its distal anchorage. This explains its increased liability to injury.<sup>5</sup> Gariepy, *et al.*<sup>6</sup> reported 6 cases of brachial plexus injury associated with shoulder dislocation; they found these lesions to be infraganglionic and in continuity with excellent prognosis

without any indication of surgical exploration. Leffort and Seddon<sup>7</sup> reported 31 cases of infraclavicular brachial plexus lesions, of which, 17 cases were associated with a dislocated shoulder. Coene and Narakas<sup>8</sup> reported 16 anterior shoulder dislocations, five of which had transient suprascapular nerve lesions. Many of these patients have some neurological deficit of the upper limb prior to reduction, usually numbness over deltoid ("badge patch") but any deficit usually resolves postreduction. In our case, all group of muscles had grade 4 or 5 motor power recovery by 5 months. It is important to note that signs of neuropraxia and neurotmesis are similar until the neuropraxia wears off and, therefore, it is better to wait for 5 to 6 months before considering exploration. To wait longer than this is disadvantageous since the results of nerve repair after this period are not good. Electrical investigations should be delayed for 5-6 weeks as they cannot differentiate axonotmesis from nerve rupture. Gross sensory recovery always occurs before motor recovery and is a good indicator of potential for recovery. Physiotherapy has a very important function in maintaining mobility until motor function returns.<sup>9,10</sup> The message to be noted is to always look for clinical evidence of brachial plexus injury in patients with anterior shoulder dislocation as it is this which causes the resultant morbidity rather than dislocation itself. In elderly patients signs of nerve injury with shoulder dislocation are easily overlooked and subsequent loss of shoulder function in elderly is often thought to be due to immobilization and stiffness. Only early detection of nerve lesions allows adequate treatment.

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