Upper Extremity Nerve Lesions Following Shoulder Dislocation

by
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Key words: shoulder dislocation, reduction maneuver, peripheral nerve palsy, brachial plexus paralysis.

Introduction

Upper extremity nerve lesions are sometimes complicated to traumatic shoulder dislocation. The axillary nerve is the most frequent nerve to be damaged associate to traumatic dislocation of the shoulder. There is, however, a different type of paralysis in bracial plexus region. In this series, the mechanism of injury, the method of reduction, treatment and degree of recovery in each of these patients were investigated.

Materials and methods

Between November 1981 and October 1993, 78 cases with traumatic shoulder dislocation were investigated at the Department of Orthopedic Surgery, Saga Medical School. Total cases were 78 (51 male and 27 female). Their ages were ranging from 6 to 98 year old (mean, 45.7).

The types of these trauma and the reduction maneuver were studied whether nerve lesions were exist or not. And clinical course of patients with nerve lesions were investigated.

Results

All 78 cases were anterior type of dislocation. Of these, upper extremity nerve lesions following shoulder dislocation were seen in 16 cases (20.5%). Details of involved nerve palsy were 1 case of total type paralysis of brachial plexus, 4 cases of axillary nerve palsy, 1 case of median and ulnar nerve palsy, 1 case of radial nerve palsy, and 9 cases of sensory disturbance and numbness.

The type of trauma were fall, fall down, sports, traffic accident, blow and traction injury, especially many were due to fall down and sports (Table 1).

There were many reduction maneuver performed such as traction under anesthesia, Hippocrates' maneuver, Stimson’s maneuver, Manes' maneuver, reduction by person who was not doctor, and open reduction (Table 2).

Case reports

Case 1

A 75-year-old right handed female with Parkinson disease complained of her left shoulder pain and
disability of left upper extremity came to our hospital on March 4, 1992. Three months before that, she fell down and suffered dislocation of left shoulder with fractured the head of humerus. A closed reduction and plaster casting for 3 weeks were applied by a doctor in other hospital. Physical examination in our hospital demonstrated a masked-like face and limitation of the shoulder joint motion, muscles atrophy of the shoulder girdle, supination contracture of the forearm and intrinsic minus position of the fingers. She was diagnosed as having high level palsy of median and ulnar nerve. Roentgenogram showed dislocated the head of humerus with fracture (Fig. 1).

As treatment for this patient, range of motion exercise and wrist driven prehension orthosis were applied conservatively. The neurological impairment gradually recovered and about 2 years after the treatment close to fair grade motor recovery and enlarged ROM of the shoulder, elbow and wrist joints were noted. But intrinsic minus deformity of the hand was continued and MMT of abductor pollicis brevis muscle was trace level.

Case 2

A 85-year-old right handed female fell down and hit her right shoulder. She was diagnosed as having dislocation of right shoulder joint at a private hospital and transferred to our hospital on February 11, 1993. She had past history of subcutaneous tendons rupture of right extensor digitorum, extensor indicis proprius and extensor digiti minimi proprius. On examination, an axillar type of anterior-inferior dislocation of the right shoulder was noted. She complained of severe pain in motion of the joint. Roentgenograms showed axillar type dislocation of the humerus with the avulsion fracture of greater tuberosity (Fig. 2). The shoulder was immobilized using suspension arm sling after the reduction of Manes' maneuver. She was diagnosed as having brachial plexus paralysis due to traumatic dislocation of the shoulder at that time and showed the symptoms of complete high level palsy of radial and ulnar nerve, and incomplete high level palsy of median nerve.

Oppenheimer type wrist hand orthosis was applied for radial nerve palsy. About 9 months after the injury, flexion of fingers and extension of wrist and fingers were improved fairly well. But MMT of intrinsic muscles innervated by ulnar nerve were graded poor to fair.

Discussion

Traumatic shoulder dislocation sometimes cause nerve damage. In the literature posterior cord palsy, especially axillary nerve palsy are well-known. However there are not only posterior cord palsy but also total, medial and lateral cord palsy. The mechanism of nerve damage in shoulder dislocations was formerly thought to be a result of pressure of the inferior displaced head of the humerus. Recent investigation showed, however, that the mechanism was nerve stretching due to extensive external rotation, which commonly occurs in the dislocations. Milton demonstrated that strong downward traction or internal rotation at the same time when using Hippocrates' or Kocher's maneuver might injure the axillar nerve or radial nerve, so he recommended the reduction method of external rotation of the arm before downward traction.

Reduction of the dislocated shoulder joint should be done very carefully and tenderly to brachial plexus under anesthesia, and violence and repeated reduction should be avoid. Our data in reduced cases under anesthesia demonstrated good result except only one case out of 17 cases showed sensory disturbance of the middle, ring and little fingers (Table 2). This case of anesthesia was cervical epidural...
Table 1  The type of trauma in shoulder dislocation

<table>
<thead>
<tr>
<th>Nerve lesion</th>
<th>+</th>
<th>-</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>9</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Fall down</td>
<td>16</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>Sports</td>
<td>21</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>Traffic accident</td>
<td>12</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Blow</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Traction injury</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>16</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 2  The reduction maneuvers performed in traumatic shoulder dislocation

<table>
<thead>
<tr>
<th>Nerve lesion</th>
<th>+</th>
<th>-</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traction under anesthesia</td>
<td>16</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Hippocrates' maneuver</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Stimson's maneuver</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Manes' maneuver</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>By own or by friend</td>
<td>8</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Open reduction</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Unknown</td>
<td>32</td>
<td>11</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>16</td>
<td>78</td>
</tr>
</tbody>
</table>

Fig. 1  Roentgenogram of case 1 showed dislocated the head of the left humerus with fracture.

Fig. 2  Roentgenogram of case 2 showed axillary type dislocation of the humerus with the avulsion fracture of greater tuberosity.
anesthesia. So it seems that the reduction performed tenderly and anesthetically, the nerve lesions might seldom happened.

In nerve lesion in traumatic dislocation of the shoulder, the prognosis of the cases with only sensory disturbance or numbness was excellent.

On the other hand, it takes for a long time to recover for the cases with marked motor paralysis. As far as concerning about the time of surgery such as neurolysis, Bateman\(^1\) mentioned that if the paralysis persists for three months, as shown clinically and electrically, surgical exploration should be carried out. Berry et al\(^2\). stated that surgical exploration should be waited for four months after the injury according to EMG study.

**Conclusion**

1) Nerve lesions of upper extremity associated with traumatic shoulder dislocation in 78 cases were evaluated.
2) Nerve lesions were seen in 16 cases (20.5%) out of 78 cases of shoulder dislocation.
3) In the level of brachial plexus, various type of nerve palsy were seen as well as posterior cord palsy.
4) Tenderly reduction of the traumatic shoulder dislocation under anesthesia is very important to prevent nerve lesion.

**References**

外傷性肩関節脱臼に合併した上肢末梢神経麻痺について

佐賀医科大学整形外科
浅見 昭 彦・渡辺 英夫
西川 英夫・重松 正 森
肥後 知 子

外傷性肩関節脱臼は、日常よく遭遇する疾患であるが、ときに上肢末梢神経麻痺を合併することがある。今回、これらの症例について受傷原因、脱臼整復法、治療方法、予後などを調査し、検討を加えたので報告する。

対象は、外傷性肩関節脱臼にて当科を受診した 78例（男性 51例、女性 27例、年齢 6 〜 98 歳、平均 45.7歳）である。

何らかの上肢末梢神経障害をきたしたものは 16例（20.5％）で、腕神経収全型麻痺 1例、腋窩神経麻痺 4例、正中・尺骨神経麻痺 1例、橈骨神経麻痺 1例、上肢の知覚障害やしびれ感を訴えたもの 9例であった。

原因は転倒、スポーツによるものが多く、脱臼整復法については、麻酔下に整復されたものは神経障害の合併頻度が少なかった。治療は全て保存的に行っていたが、骨折を含めていた 7例でやや成績が不良であった。

外傷性肩関節脱臼の整復においては、肢位に注意しながら、対応的に行うべきである。