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Case Report: Neglected Locked Anterior Shoulder Dis-Location with Upper Brachial Plexus Injury

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ABSTRACT

Introduction: The most severe and least common side effects of shoulder dislocations are brachial plexus injury. Patients generally approach with a shoulder in abduction and external rotation, a behavior that orthopedic surgeons are accustomed to seeing in patients with an anterior type of shoulder dislocation. There are different viewpoints on whether surgery should be attempted to treat these old injuries with BPI and, if so, at what time.

Material and Method: We had a 25-year male old patient who was admitted through an outdoor clinic with a 'neglected locked anterior dislocation' that had been unrecognized for the last two months. After consent and fitness, he was managed with an open reduction as well as the Latarjet technique, followed by neurotization for BPI upper trunk after four months had passed with no improvement.

Result: The patient achieved 90 degrees of abduction and forward flexion in the 4th month of follow-up neurotization with a stable shoulder joint.

Conclusion: We advocate that old stuck shoulder dislocations along with BPI be reduced right after using an open method, stabilized by using the Laterjet intervention if still unstable, and surgically handle the wounded nerves after four months of no sign of regeneration.

Keywords: Brachial plexus injury, Brachial plexus, Bankart lesion, Anterior Shoulder dislocation, Hillsach's Lesion, MCN: Musculocutaneous nerve, OPD: Outdoor department, BPI: Brachial plexus injury, HSL: Hillsach's Lesion, NLAD: neglected locked anterior dislocation

INTRODUCTION

Dislocations of the shoulder joint account for almost 45% of all dislocations that present to an orthopedic surgeon with almost 90% being the anterior subtype[1]. Young adults participating in sports and elderly patients falling have age-related incidence peaks[2]. A dislocation is categorized as simple if no other lesion of the bone, nerve, blood vessel, or rotator cuff is present, and complex if any of these injuries is also present[2,3]. A well-known side effect of glenohumeral dislocation is nerve damage, which can occur anywhere from 15.8% to 48% of the time[3]. Delbit and Cauchoix reported the first study about brachial plexus injury in connection with shoulder dislocation in 1910. They highlighted the involvement of infra-clavicular plexus with a good prognosis with conservative therapy[4]. There has been a paradigm shift in the treatment of peripheral nerve injuries in recent years due to the increased use of surgical nerve release, nerve harvesting and grafting, and nerve exchanges in the care of severe nerve damage that will not otherwise recover[5]. It is also well known that postponing surgical management for peripheral nerve damages is a risk factor for bad results due to time-related declines in axonal regenerating ability, as well as rising motor nerve endings degeneration and muscle deterioration[6,7]. In order to achieve a successful recovery of limb function following BPI with shoulder dislocation, long-term collaboration between the patient, surgeon, physiotherapist, and frequently also psychological support is required[8]. Identification of individuals with severe axillary nerve trauma that have no chance of recovery and early intervention are the diagnostic and treatment issues. Finding non-recovering injury is crucial so that they can be referred to treatment units with specialist equipment.

CASE REPORT

A 25-year-old young student approached our orthopedic-surgery outdoor setup, Lahore General Hospital Lahore, with issues with his right shoulder, 2 months after the Road Traffic accident. He suffered an injury to his right shoulder while riding his bike, receiving a direct impact from a car's sideview mirror while his elbow was in a 90-degree flexion and his shoulder was in an internal rotation

and abduction. He was unable to move his shoulder at that instance. He was managed by a jarrah without getting any radiographic investigation. But he remained in the same difficulties till his appearance in OPD. Now he was unable to move his shoulder in all directions with ease due to pain & decrease power. There was a palpable anterior globular bony enlargement with clearly discernible borders. Contrary to the opposing side, deltoid muscle wasting was apparent. While the passive range of motions was 150 degrees of forward flexion, 10 degrees of extension, 30 degrees of external rotation, and 15 degrees of abduction, while the active range of motions was 15 degrees of abduction, zero degrees of forward flexion, and 30 degrees of external rotation. Over the deltoid area, there was a loss of sensation. There was no additional noteworthy history found. Radiographs (X-rays & Ct scan films) showed the presence of a humeral head out of the glenoid socket with a 25 percent of HLS.

NCS & EMG resulted in the conclusion of upper trunk BPI injury involving axonotmesis of MCN and Axillary nerve while sparing the Suprascapular nerve. After detailed counseling regarding the prognosis of management of NLAD along with BPI, consent was taken for the staged procedure. He went for open reduction & stabilization via Laterjet procedure and was discharged after two days with a sling for 3 weeks. He remained in follow-up on a twice-weekly basis for the first two months to assess the shoulder stabilization and recovery of BPI.

Two months afterward, he was operated on for Axillary nerve injury alone as there was no recovery recorded in the Axillary nerve while partial recovery in MCN and full recovery in the Suprascapular nerve were achieved. Susan Mackinnon's method of nerve transfer was practiced as a branch of the radial nerve to the medial head of the triceps was co-opted with an anterior branch of the axillary nerve (Fig-1)

His arm was placed in a sling for 3 weeks to allow for successful cooptation of nerves. The passive movements started. He remained under regular follow-up and achieved regular active motion in the deltoid muscle with an increment of degrees. After 4 months of 2nd surgery, he achieved 90 degrees of abduction and forward flexion (Fig-2).

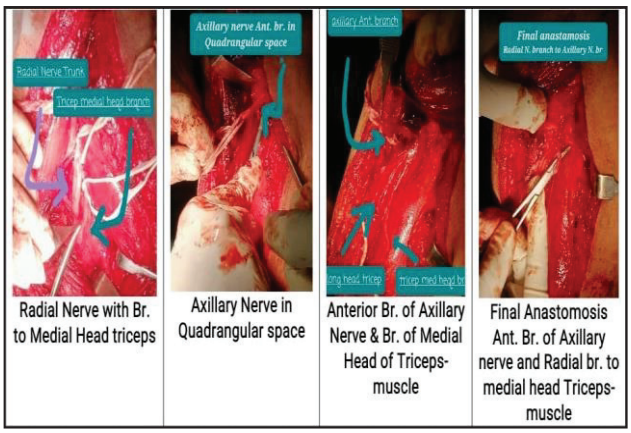

Fig-1: Per-Op Pictures Of Nerve Transfer

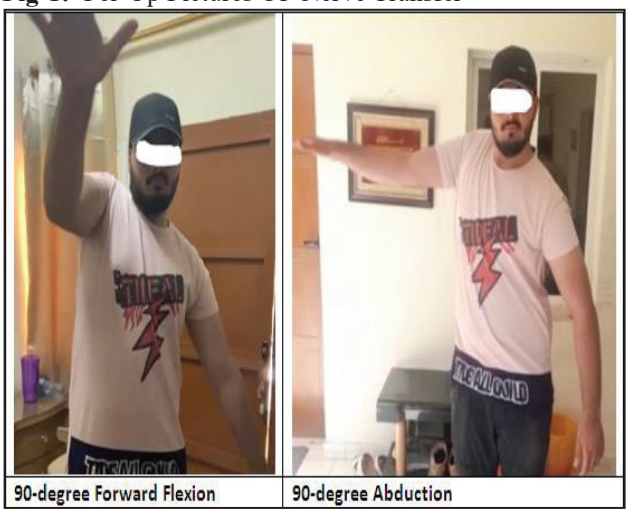

Fig-2: Follow-Up on 4th Post-Op Month

DISCUSSION

Overlooked dislocations are tricky to treat given the soft tissue rigidity around the joint, glenoid fossa fibrosis, and bony disorders in the glenoid and humerus[8]. Moreover, it is challenging to accomplish a closed reduction in such scenarios since the dislocation is typically locked. Furthermore, since the majority of these individuals are geriatric and have disuse osteoporosis of the bone, attempting the latter could contribute to a fracture. According to earlier findings, a paucity of discomfort, and the local doctor's incompetence are the main reasons why patients with anterior shoulder dislocation delay in seeking treatment[9].

Latarjet surgery can be used to manage the non-critical glenoid bone loss and an engaged HSL with either a strong probability of recurrence or more than 30% Hill-Sachs defect[10].

Because the distance between the anchorage points of the nerves in the upper limb is close, making the nerves susceptible to traction, nerve injury with a shoulder dislocation has been known to occur following low-velocity trauma[11]. Upon a dislocated

shoulder, brachial plexus damages are generally postganglionic and infra-clavicular but continuous[12]. The mechanisms may involve direct humeral head trauma, compressive stress from a hematoma, or stretching at the instant of the injury. It's also conceivable for nerves to become entrapped during the reduction of the dislocation. A complete lesion's prognosis is bad. Normal recovery from neurologic impairments takes 4-6 months[13]. The axillary, MCN, and radial nerve injuries are most frequently detected when the upper limb is dragged downward in internal rotation and abduction, injuring the motor branch of the nerve while leaving the more distantly situated sensory branch unharmed[14]. As in our case, the patient's arm was in internal rotation and abduction at the time of direct impact trauma.

In the Robinson et al. trial, younger folks had a high prevalence of axillary nerve injury on their own[15]. The infra-clavicular plexus carries the majority of the traction force; the axillary nerve is the branch that is closest to its distal anchoring, which argues for its higher risk of injury[16]. Thirty-one cases of infraclavicular brachial plexus lesions were documented by Leffort and Seddon, and 17 of those incidents had dislocated shoulders[16]. Six examples of brachial plexus injury related to shoulder dislocation were described by Gariepy et al. in 2016. They reported that these lesions were infra-ganglionic, continuous, and had a satisfactory prognosis without any sign of surgical exploration[17]. Five of the 16 anterior shoulder dislocations reported by Coene and Narakas showed temporary suprascapular nerve lesions[18]. Same finding was present in our case. It is vital to remember that neurotmesis and neuropraxia share symptoms up until the neurotmesis subsides, thus it is preferable to wait for 3 to 5 months before thinking about the investigation Waiting any longer causes injury since delayed nerve repair results in subpar recovery. Most authors believe that operative intervention should be postponed until 3–6 months after the injury because it is impossible to differentiate between neurotmesis and neurapraxia before the latter wears off[15].

The key takeaway is that brachial plexus injury should always be suspected in patients with anterior shoulder dislocation because it is this condition that ultimately leads to severe morbidity rather than the dislocation itself.

CONCLUSION

We would recommend that old locked shoulder dislocation along with BPI should be immediately reduced with an open approach along with stabilization through the Laterjet procedure if it remains unstable and timely intervention for the injured nerve after 4th month of injury after making sure the absence of self-regeneration.

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