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CASE REPORT

Brachial Plexus Neuropraxia: A Report of 3 Cases

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Introduction

Brachial plexus injury is an increasingly common peripheral nerve condition. It commonly involves young people between 20-40 years of age, the other dominant subgroup being neonates with birth trauma. Motor cycle accidents with resultant falls, lead to traction injury to the brachial plexus and this constitute over 85% of cases. The last three decades have witnessed increasing successful surgical management and role of early diagnosis and proper surgical repair has been repeatedly emphasized[1,2,3,4,5]. In India, the last four decades have seen the evolution of peripheral nerve surgery with contributions from orthopedic, neurosurgery, plastic and hand surgeons. A multidisciplinary approach including radiology, neurophysiology and physiotherapy is likely to give optimal outcomes. Apart from road traffic related trauma, brachial plexus can get injured by radiation, thermal and electrical shock. Ballistic injuries also constitute a relatively uncommon cause. Anatomical neural disruption of increasing severity merits surgical intervention.

In this paper three unusual cases of brachial plexus injury collected by the author over four decades are presented.

Case no 1: A 35 years male, presented to the emergency OPD in 1979, with bilateral upper limb weakness. The patient was an under trial prisoner who on one occasion was laid prone on the floor with backward traction on his arms in an attempt to a confession. Following the incidence the patient developed complete paralysis of both upper limbs. On evaluation at a tertiary care centre, there was 0/5 power of both upper limbs with 100% sensory loss from C5 to T1. A few hours old close stretch injury did not merit intervention and the patient was empirically started on prednisone 20 mg twice a day for 15 days with neurotropic vitamins and antacids. A week later his neurological status had improved by 50%. At 4 weeks follow up motor deficit had recovered by 95% and deep tendon reflexes were normal. He was subsequently lost to follow up.

Case no 2: A 60 year male, presented to neurosurgery OPD in 1984, twelve hours later a fall on outstretched upper limbs from a running bus. Examination revealed multiple abrasions with no bony or head injury. Within hours he developed progressive sensory motor deficit in both upper limbs. There was, however, no weakness or numbness in lower limbs or autonomic problems.

On examination patient had 0/5 power in upper limbs with hypotonia and areflexia with total sensory loss in C4-T1 distribution in both the limbs. He was advised conservative management with 40 mg prednisone orally. At 1 week follow up, patient had 25-30% improvement in both motor power and sensory deficits. The patient was advised to continue oral prednisone in reducing weekly dosages of 30 mg, 20 mg and 10 mg. At the end of 4 weeks 85-90% recovery was recorded both in motor deficit and sensory loss and steroids were discontinued. Follow up at 2 months revealed 100% sensory motor recovery in upper limbs.

Case no 3: A 25 yr male presented to neurosurgery OPD in 2013 with history of right upper limb weakness following electrocution a day before. He was touching a telephone pole with his right hand during a lightning strike. There was no external injury or history of loss of consciousness. However, his right upper limb was completely paralysed with complete sensory loss. A detailed examination 24 hours later revealed flaccid paralysis (0/5) with loss of tendon reflexes in right upper limb and complete sensory loss. Nerve conduction tests were conducted on 5th day of injury and revealed grossly reduced conduction velocity in right upper limb. The patient was put on oral prednisone 20 mg twice daily. Improvement was evident after 48 hrs with wrist movement. The patient was followed up at weekly intervals with tapering of steroids. There was progressive improvement of sensory motor function till full clinical recovery by six weeks. Nerve conduction study at 5 weeks revealed 80% improvement in conduction velocity.

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Discussion

Brachial plexus injuries commonly affect young victims in motor bike accidents[1,2]. Rarely, in 15-20% other causes of injury are also reported, including lightning strikes, electric and injection injury[4,5,6]. In this report two patients had bilateral brachial plexus involvement, which is extremely rare. The third case due to lightning strike is also rare with few cases reported till now[7,8].

In total brachial plexus injury a complete recovery is rare. Brachial plexus injury in which there is root avulsion or involvement, spontaneous recovery is unlikely, hence, nerve transfer and neurotisation is the treatment of choice. However, spontaneous recovery is expected in partial or distal injury to the plexus due to axonal regeneration[9,10,11]. Large number of factors play important role in nerve regeneration including nerve growth and other neurotrophic factors[9,10,11,12,13].

Our first and second patients had stretch injury with complete bilateral brachial plexus involvement. The impact of the force seemingly distributed across both upper limbs. Despite complete involvement of the plexus, the lower intensity force might have been an important factor for recovery. The lightning strike in the third case might have been of low intensity due to the telephone pole taking the major electrical discharge to earth. The brachial plexus presumably suffered a low intensity current damage, which was mild and thus the patient had 100% recovery in 6 weeks time.

In this paper we have highlighted spontaneous recovery in all three cases, indicating neuropraxic injury to the plexus. Role of steroid therapy in nerve injury is not established. In all three cases treatment with prednisone was commenced within hours or a few days of injury and continued for 3-4 weeks. Early steroid in acute phase reduces inflammation and prevents cytokines responsible for nerve damage. However, it is difficult to prove the role of steroid which will remain a conjuncture till controlled trial may address this problem.

Conclusion

Author's experience, over a period of 40 years, yielded three unusual cases of brachial plexus injuries. In two, the plexus involvement was due to traction injury and was bilateral. The third patient sustained injury due to lightning strike. All three patients initially had complete sensory motor deficit which improved completely within 4-6 weeks. Though steroids were used in all three, it is not possible to prove their role in neurologic recovery.

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