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TRAUMATIC BRACHIAL PLEXUS INJURIES

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Until a few decades ago, the initial treatment of Brachial Plexus injuries was conservative with regard to the nerve lesion itself. Physiotherapy was the main stay of treatment with tendon transfers and arthrodesis of selected joints done at a later stage. The advances in basic sciences in the field of nerve repair and regeneration and the advent of microsurgery have changed the scenario. Interested surgeons in the field perform exploration of the Brachial plexus soon after injury, and have shown impressive results after direct nerve surgery. This forms one of the important fields of interest and work of some microsurgical units in India.

Brief Surgical Anatomy

Anatomical knowledge is crucial and helpful to make treatment decisions. The lesion could occur inside the cervical canal or very near the exit in the inter vertebral foramina. They are surgically non accessible and are called pre ganglionic. In contrast extra foraminal lesions are surgically accessible and potentially repairable and are called post ganglionic.

Brachial plexus is formed from the anterior primary rami of the cervical roots 5 to 8 and T1. Each spinal nerve root sends axons to more than one major nerve and each major nerve contains fibres from more than one spinal root. So innervation of most muscles is multilevel. Table 1 gives the innervation of the muscles of the upper limb.

Following points are helpful to localize the site of the lesion. The dorsal ramus of the spinal nerve that innervates the Para spinal muscles and the rami communicans that communicate with the sympathetic ganglion are left intact in post ganglionic injuries. If the Para spinal muscles are paralysed or Horner's Syndrome is present, then direct surgery on the roots is not possible. Examining the muscles that are supplied by branches taking off proximally gives an idea of the site of the lesion. Phrenic nerve arises from contributions from the roots of third, fourth and fifth cervical roots. So paralysis of hemi diaphragm suggests C 5 root injury. Denervation of rhomboids and winging of the scapula also suggest proximal level injury. Coming further down, the suprascapular nerve originates at the Erb's point at the confluence of the fifth and sixth nerve roots. This nerve supplies supraspinatus and infraspinatus muscles. Infraspinatus is the principal external rotator of the humerus. Intact external rotation localizes the lesion distal to the Erb's point. Conversely paralysis of the supraspinatus and infraspinatus will localize the lesion proximal to the Erb's point. This is an important test to be done.

Clavicle roughly corresponds to the level of the trunks. Infraclavicular plexus is surgically