

Saturday Night Palsy - What if it Happens in OT

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Perioperative peripheral nerve injury (PNI) is not a well-recognized complication with an incidence of 0.4%. It has been increasingly recognized over the past few decades [1]. Perioperative peripheral nerve injuries (PPNIs) complicate both general and regional anaesthesia. Studies have revealed that anaesthesia-related nerve injury (ulnar nerve 28%, brachial plexus 20%, lumbosacral nerve roots 16% and spinal cord 13%) has become the third most common cause of anaesthesia-related litigation [2]. The purpose of this article is to comprehensively review perioperative PNI associated with general anaesthesia and follow up of a case with PNI till recovery.

A 24-year old female admitted to hospital for excision of glomus jugulare tumor of right ear. Blood investigations and physical examination results were normal and there was no history of any other chronic disease or familial peripheral neuropathy.

The patient was laid in a supine position on the operating table with a soft cloth under the pressure points. The right arm and the left arm were parallel next to the body. Except for invasive blood pressure monitoring on the right hand throughout the procedure no intervention such as intravenous or intramuscular injection was made. Automatic blood pressure device cuff was attached on left arm. Surgery lasted for approximately 13 hrs. Throughout the surgery nitrous oxide, isoflurane, propofol, vecuronium were administered. Due to prolonged surgery time and extent of surgery patient was kept on elective mechanical ventilation for the whole night. The next day patient was extubated and was shifted to ward.

Later she started complaining of pain in the right arm. On examination ecchymosis was noted in the right arm with drop hand. A diagnosis of acute radial nerve palsy was made. No pathology was determined on computed tomography brain imaging. Physical therapy such as range of motion (ROM) exercises and occupational therapy were started immediately and were continued after discharge. A splint was applied to prevent contractures.

The first EMG test and nerve conduction velocity test were done 2 weeks postoperatively. The EMG findings of the triceps muscle and ulnar, median and musculocutaneous nerve conduction velocities were normal. Conduction was blocked in the radial nerve at the middle part of the right arm. After 2 months there was no movement, not even minimal, in the wrist and fingers and the sensory loss in the thumb had recovered and was confirmed by EMG. Compared with the previous EMG, a partial recovery was seen towards the distal of the nerve after 3 months. After 5 months, minimal movements started to be observed in the extensor muscles of the wrist and fingers and at 8 months there was full recovery.

Peripheral nerve injuries can cause a range of morbidity from transient and clinically minor injury to severe permanent injury sometimes leading to loss of employment. Of peripheral nerve injuries during general anaesthesia, ulnar nerve injuries are most often seen due to topography. Radial nerve injuries due to compression are seen less frequently compared to the ulnar nerve because the radial nerve passes through a deeper area [3,4].

While causative factors in PPNI can be multi-factorial like compression, stretch and ischemia of nerves. Hypertension, tobacco use, and diabetes mellitus, however are also associated with the development of PPNI [5]. In the current case standard pads were used under the extremities and the patient position was checked at intervals and there were no local causes such as cyst or tumour or any predisposing systemic causes such as hypotension or hypoxia. The probable mechanism in this patient could be double crush phenomenon. This indicates that compressive lesion occurring along a nerve in the past renders the nerve less tolerant of compression at the same or a second locus [6]. It was first described in 1973 by Upton and McComas. Disruption of axonal transport along the nerve increases the vulnerability of distal axons to compression syndromes and symptomatology. This phenomenon can be associated cervico-thoracic nerve root pathology also. The value of the concept of DCS is still a debate because there is no way to objectively verify that symptoms are attributed to this particular phenomenon [7].

Radial nerve paralysis can be due to compression from the cuff of the automatic blood pressure device used to measure blood pressure during general anaesthesia [9]. Radial nerve paralysis has been reported associated with compression of the triceps, brachialis muscle and brachioradialis muscle with hypertrophy resulting from muscular effort or excessive use of the arm muscles [8]. In paralysis due to the mechanical effect of the blood pressure device cuff, the patient generally has complaints of pain in the arm and in the physical examination, hyperemia and oedema. The possible mechanism would be frequent inflation may affect vaso-nervorum and therefore the nerve remained in hypoxia resulting in the development of paralysis.

To prevent muscle atrophy and contractures physical therapy must be applied carefully for lengthy periods. Tests like nerve conduction velocity and electromyography provide an understanding of the integrity of the nerve and location of the lesion respectively [10]. Understanding the topography of peripheral nerves enables precautions to be taken to prevent injury in the perioperative period.

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