



## Radial Nerve Palsy After Supraclavicular Nerve Block- A Rare Case Report

### KEYWORDS

supraclavicular block, Fracture, Radial nerve palsy

\* Dr Deepak Chaudhary

Deptt. of Orthopaedics, Mahatma Gandhi Medical College & Hospital Jaipur (Raj) India \* Corresponding Author

Dr Anit Kajla

Deptt. of Anaesthesia, Mahatma Gandhi Medical College & Hospital Jaipur (Raj) India

Dr Rajeshwar Kalla

Deptt. of Orthopaedics, Mahatma Gandhi Medical College & Hospital Jaipur (Raj) India

### ABSTRACT

The supraclavicular approach to the brachial plexus characteristically is associated with a rapid onset of anesthesia and a high success rate. The advantages of a supraclavicular technique over other brachial plexus block approaches are its rapid onset, complete and predictable anesthesia for entire upper extremity. It is associated with very few complications. Although radial nerve palsy is a rare complication of interscalene block but even after extensive search in literature we could not find Radial nerve palsy as a complication of supraclavicular block. Because of rarity of radial nerve palsy after supraclavicular type brachial block a case with radial nerve palsy following brachial block is being presented here which was managed conservatively and full recovery was achieved in 3 months.

### INTRODUCTION

The supraclavicular block is often called "spinal anaesthesia of upper limb" because of its universal application in upper limb surgeries<sup>1,2</sup>. The reason for its high success rate is in its anatomic characteristic; the block is performed at level of distal trunks and origin of divisions. The 3 trunks carry entire sensory motor and sympathetic innervations of upper limb except uppermost part of medial side of arm (D2). Lateral insertion of SCM muscle on clavicle used as a landmark for the location of first rib and lateral edge of dome of pleura. First intercostal space should not be reached during block. Brachial plexus injury is a potential complication of a brachial plexus block or vessel puncture. It results from direct needle trauma, neurotoxicity of injection agents and hematoma formation<sup>3,4</sup>. The neurological presentation may range from minor transient pain to severe sensory disturbance or motor loss with poor recovery<sup>5,6</sup>. The management includes conservative treatment and surgical exploration.

### CASE REPORT

A 37 year old average built male patient presented in our Hospital with complains of pain, deformity, abnormal mobility right forearm following road traffic accident. On examination there was tenderness, slight swelling, Crepitus, abnormal mobility, with painful ROM of right upper limb with intact neurovascular structure & stable BP, without external wound and no associated h/o LOC, head injury or any impending compartment syndrome. Routine radiograph showed fracture of both bones of right forearm in mid third of shaft. Patient was managed as per standard protocol along with splintage in form of above elbow slab. He was planned for elective surgery ORIF with plate fixation (LC-DCP) with intact radial nerve pre-operatively. He underwent successful surgery with under supraclavicular type of brachial block which was given without guidance of nerve stimulator. ORIF of radius was done by Thompsons approach and of ulna by direct sub cutaneous approach without use of tourniquet. In post op period radial nerve palsy was discovered [Figure 1-5]. Apart from routine post op management of fracture this patient was managed with methyl cobalamine, pregabalin, dynamic cock up splint, active and passive physiotherapy along with galvanic nerve stimulation. He recovered completely from

radial nerve palsy within 3 months post operatively which was confirmed clinically as well as EMG & NCV studies. At this time fractures were also united.

### DISCUSSION

Fanelli et al.<sup>4</sup> prospectively studied interscalene blocks (n = 171) and axillary blocks (n = 1,650) using multiple injection technique with a nerve stimulator. The relative incidence of neurologic dysfunction was higher in patients receiving interscalene blocks (4%) than in patients receiving axillary blocks (1%). Selander et al.<sup>7</sup> studied the frequency of post-anesthetic nerve lesions after axillary BPB with/without searching for paresthesia. Seeking paresthesia during a nerve block may increase the risk of post-anesthetic neurological sequelae in itself. According to Ben-David et al.<sup>8</sup> patients on heavy sedation or general anesthesia may be at increased risk of nerve injury. Pediatric patients who had a block under general anesthesia had the highest rate of postoperative neurological complications (10.3%).

A suspected mechanism during nerve block is a direct needle trauma. Patients typically have acute symptoms at the time of needle placement with painful electric shocks radiating distally down the limb in the distribution of the nerve<sup>9</sup>. After the nerve injury, the patient can complain of only mild numbness and tingling sensation. But pain is present in the majority of cases and may be described as a shooting or burning sensation. It can be exacerbated by physical factors such as pressure or touch. Severe allodynia or paresthesia can be developed with difficulty of motor activity<sup>5,10</sup>. The early sign of axonal regeneration with the reduplication of Schwann cells and axonal sprouting could be seen 1 to 2 weeks after nerve injury and the further regeneration with an improvement of initial symptoms is usually well advanced by 2 months after the injury. MRI, EMG & NCV are helpful in diagnosing nerve injury<sup>6</sup>. The BPI must be differentiated from those of the original injury, operation or misuse of a tourniquet. Tourniquet injury usually affects the radial nerve with/without the median and ulnar nerves and is correlated with a good outcome in most cases<sup>6</sup>. Conservative management is indicated if the lesions in continuity are non-degenerative or if the fascicles are intact. The treatment with medications consists of both opioid and non-opioid analgesics. Other drugs to

control acute neuropathic pain include antidepressants (tricyclic antidepressants, serotonin and norepinephrine reuptake inhibitors), antiepileptic drugs (gabapentin, phenytoin, pregabalin), membrane stabilizers (intravenous lidocaine), ketamine and systemic glucocorticoid<sup>11</sup>. In addition, physiotherapy should be immediately initiated to prevent atonia<sup>5,12</sup>. Galvanic stimulation to the affected muscles and nerve ganglion blocks has been reported to provide symptom relief<sup>9,13</sup>. If a hematoma forms, its prompt evacuation may significantly reduce symptoms. Lesions should be treated with surgical intervention if sensory or motor disturbances persist with a severe degeneration.

Sufficient knowledge of anatomy, understanding of procedure, and adept skills in needle placement are essential for prevention of BPI. Only medical agents that have been proven reliability and safety should be used for nerve block. Nerve blocks should be performed without searching for paresthesia.



Figure-1



Figure-2



Figure-3



Figure-4



Figure-5

Figure 1 : Supra Clavicle Block

Figure 2: Pre op Xrays

Figures 3 Post op Xrays

Figure 4,5: Post up Wrist Drop

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