

Radial Nerve Palsy Following Hemiarthroplasty of Hip: A Case Report Implying the Importance of Perioperative Patient Positioning

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Abstract

Introduction: Peripheral nerve injury is a dreadful post operative complication which is a source of great distress to the patient and the surgeon. An upper limb neuropathy after a lower limb surgery is even worse and difficult to defend in medicolegal litigations as it is essentially avoidable. Radial Nerve Injury can happen due to mechanical compression between hard surgical table and proximal arm while the patient is in a lateral decubitus position. This report signifies the importance of patient positioning and prevention of pressure points peri operatively to reduce the risk of this mishap.

Case Report: A 68 year old female who underwent hemiarthroplasty of the left hip complained of numbness and weakness of the right hand and inability to hold objects. The procedure was done in right lateral decubitus position and it lasted for about 45 minutes. The patient and treatment team had a tough time in the initial post operative period as she was unable to feed herself, hold on to objects and walk with the support of a quadrangular walker due to the weakness of right hand. Splint, rehabilitative exercises and galvanic current stimulation were employed for her treatment.

Conclusion: Our case report stresses the importance of peri operative patient positioning and general awareness of potential complications that can happen which are preventable.

Keywords: Radial Nerve Palsy, Hemiarthroplasty, Lateral decubitus position

Introduction

Peripheral nerve injury is a grave post-operative complication and a significant source of professional litigation.

Although hemiarthroplasty of hips associated with sciatic nerve injuries with an incidence of 0.2–1.9% [1], radial nerve injury seldom has been reported in literature. Brachial plexus palsy can occur as a result of lateral decubitus position and prolonged abduction of arm during hip arthroplasty [2]. Direct compression of the nerve between the bone and hard surgical table can be another cause. Proper placement of an

axillary roll, adequate padding over vulnerable areas, and optimum positioning of the patient during surgery can abate this risk. Our case report signifies the importance of careful patient positioning during surgery and prevention of pressure points to avoid this dreadful complication.

Case Report

The patient is a 68-year-old female who underwent hemiarthroplasty on the left side for fracture neck of femur. She had no significant comorbidities such as diabetes mellitus or other peripheral neuropathies. The patient was given spinal anesthesia and positioned in the right lateral decubitus position with cotton paddings under the right axilla, right fibular neck, and right malleoli. Hemiarthroplasty was done using posterior approach to

hip, and the procedure lasted for almost 45 min without any complications. Postoperatively, she was kept in intensive care unit for 24 h. On the 1st post-operative day, the patient complained of pain and weakness of her right hand and inability to hold drinking cup. The wrist and fingers were in a flexed attitude in the resting position (Fig. 1a). A detailed examination revealed the absence of wrist and finger extension on the right side (Fig. 1b). Numbness was present over dorsum of the right hand. Opinion of a neurologist and an anesthetist was taken after getting a computed tomography head to rule out central causes, and diagnosis was formulated to be radial nerve palsy. The patient was given a wrist drop splint and rehabilitative measures from physiotherapy department. It was unable to mobilize the patient with a

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Figure 1: (a) Right hand in resting position shows flexed attitude of wrist and fingers. (b) Patient while trying to extend bilateral wrists and fingers.

walker as she had difficulty in holding the handlebar. On the 14th post-operative day, she underwent suture removal for the surgical wound. She underwent electro physiological study of the bilateral upper limbs in consultation with a clinical physiologist. The results were consistent with severe right radial neuropathy with conduction block above elbow level and axonal loss distal to the injury (Table 1). She was asked to continue the splint and rehabilitative exercises. Galvanic current stimulation therapy was given for 1 month at a nearby rehabilitation center. At 3-month follow-up, the patient was ambulant and sensory symptoms of the right hand decreased with partial recovery of finger extension. The thumb was still dropped. She was unable to feed herself and groom up with the help of the right hand. However, subjectively, she was feeling improvement. She was followed up every 3 months, and at 9th month, the radial nerve palsy had completely resolved. Examination revealed complete extension and flexion of all fingers including thumb and wrist. The grip strength was increased and she was able to carry out all activities of daily living. Sensations were intact. The

patient was evaluated by same doctor during the whole follow-up.

Discussion

Injury to an upper limb peripheral nerve is scarcely seen after lower limb surgery. It can occur as rare sequelae to general anesthesia [3]. Ulnar neuropathy occupies one-third of these cases followed by brachial plexus injuries (23%) and lumbosacral roots (16%) [4]. Only a single case of radial nerve palsy was seen associated with hip arthroplasty after PubMed and Cochrane database search. The incidence of nerve palsies after hip replacement surgery is 1–2% [5]. The predisposing factors include female gender, smoking, and leg lengthening [2]. Superficial nerves such as ulnar nerve and common fibular nerve are commonly seen injured due to mechanical compression. Another important factor is the time taken for the surgical procedure as longer duration of compression raises the chance of neuropathy. The radial nerve is not commonly injured due to mechanical compression [6]. As the nerve runs on the posterior aspect of humerus, poor positioning of the arm

on the edge of table or against a hard object can produce stretch or compression of the nerve resulting in ischemia of vasa nervorum, leading to neuropraxia. Literature has shown radial nerve palsy from the use of blood pressure monitor, a self-retractor for the dissection of the left internal mammary artery for coronary artery bypass grafting, and a Kent retractor for upper abdominal surgery [6,7]. Lateral decubitus position has produced “Saturday night palsy” in perioperative period [3]. Our patient too was in the right lateral position, and the impingement of proximal humerus on the surgery table was believed to be the cause of wrist drop. We believe that the problem could have been avoided with extra padding over proximal arm. Manipulation of the patient’s leg like giving traction or relocating the prosthesis head into acetabulum could have produced different forces and traction on areas where nerve could have been compressed or stretched. The relatively simple structure of radial nerve must have been another causative factor as its response to injury would have been suboptimal. In our case, the whole procedure was finished in almost 45 min, and the occurrence of wrist drop was contradictory to the common belief that only increased operative time posed a significant threat of injury to the peripheral nerves due to mechanical compression. Furthermore, the appearance of nerve damage needs not be in the immediate post-operative period. It can occur several days later after the procedure [8]. Wallerian degeneration occurs in distal part of the nerve subjected to compression or stretch injury [3] which lasts for about 2–7 days. The regeneration rate varies from 4 to 11 mm per day [8], and remyelination of the regenerated axons lags behind by 9–20 days [8]. It took almost 9 months in our case to achieve full recovery of the nerve.

Table 1: Electrophysiological study of bilateral radial nerve showing conduction block of the right radial nerve at above elbow level and the right-sided distal axonal loss due to Wallerian degeneration		
Examination	Right radial nerve	Left radial nerve
CMAP stimulation below elbow	8mV	12mV
CMAP stimulation above elbow	7.9mV	11.3mV
SNAP	11.7µV	28.3µV
CMAP: Compound muscle action potential, SNAP: Sensory nerve action potential		

Conclusion

Peripheral nerve injuries in the post-operative period account for great stress both to the patient and doctor. From a medicolegal perspective, this

complication is difficult to defend being essentially avoidable. Here arises the importance of patient positioning and adequate preventive measures perioperatively. The whole operative staff including surgeon, anesthetist, and

the nursing staff should be aware of the same. The surgeon should also document the appropriate protective measures taken in the operative notes so as to avoid future litigation.

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