

“Claw Hand” – An uncommon complication following general anaesthesia

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Peripheral nerve injuries during anaesthesia continues to be a significant source of morbidity for patients and liability for anaesthesiologists. Ulnar nerve is the most commonly involved nerve. Despite the best efforts at careful positioning and padding it is not always a preventable complication. We came across a patient who developed partial claw hand due to ulnar neuropathy following modified radical mastoidectomy.

Keywords: General anaesthesia; positioning; ulnar nerve; neuropathy; claw hand

Introduction

Postoperative peripheral nerve injury is a well - recognized complication of anaesthesia and surgery.¹ The exact incidence is difficult to define because of the heterogeneity and quality of studies. A retrospective review quotes an incidence of 0.03%.² It leads to significant morbidity for the patient and serious professional liability for anaesthesiologists. Ulnar nerve is the most commonly involved nerve. Poor intraoperative positioning is implicated as a culprit, but various other factors may also play an important role in causing ulnar neuropathy.³ We hereby report a case of ulnar neuropathy leading to partial claw hand following mastoidectomy in a patient who had no predisposing factors and which took six weeks to resolve completely.

Case report

A forty year old female, with a BMI of 25kg/m², ASA grade I, was scheduled to undergo left sided modified radical mastoidectomy (MRM) for chronic suppurative otitis media. Pre-anaesthetic assessment revealed unremarkable medical history. Haematological and biochemical investigations were within normal limits. For induction of anaesthesia, a standard protocol comprising of glycopyrrolate, propofol and vecuronium was used. After successful endotracheal intubation, arms were kept supinated along the side of torso on padded arm rest. The head was rotated to the right side and surgery commenced. Monitoring for heart rate,

ECG, non-invasive blood pressure, oxygen saturation, endtidal carbon dioxide and temperature was conducted. Anaesthesia was maintained with oxygen, nitrous oxide and isoflurane; morphine for analgesia and intermittent vecuronium for neuromuscular relaxation. Surgery lasted for three hours during which patient remained haemodynamically stable. Blood loss was minimal and 2litres of ringer lactate solution was infused intraoperatively. Following completion of surgery, inhalational anaesthetic agents were discontinued and neuromuscular blockade was reversed with glycopyrrolate and neostigmine. The patient was successfully extubated and shifted to recovery room. Two hours later, she complained of numbness and paraesthesia along the hypothenar area of hand and ulnar aspect of forearm along with weakness of left hand. Examination revealed decreased sensation in the area supplied by the ulnar nerve and motor power was also decreased in the forearm muscles and deep muscles of hand innervated by ulnar nerve. Patient was referred to a neurologist and ulnar neuropathy was diagnosed. Nerve conduction study was done which revealed ulnar nerve involvement at elbow joint. Patient was prescribed oral steroid and methylcobalamine. The patient had regular follow up and the neurological deficit resolved completely over a period of 6 weeks.

Discussion

Perioperative nerve lesions can damage a successful surgical procedure, handicap a patient with a severe



functional disability and leave the medical team facing possible protracted and unpleasant litigation. Initially, thought to be due to the effect of anaesthetic agents, Budinger was first to recognize that peripheral nerve injuries were secondary to malpositioning of patient on the operating table with consequent stretching and compression of the nerve.⁴ The risks of peripheral nerve injury is greater under general anaesthesia because nociceptive mediated withdrawal reflexes are absent and the nervous system is subjected to greater damage.^{2,3}

The ulnar nerve is most prone to injury because it has a superficial course and there is close proximity of the nerve to the medial condyle at elbow. Its compression at this site is also referred as cubitus tunnel external compression syndrome. Furthermore, the nerve is more susceptible to hypoxic injury. In our patient partial claw hand was secondary to ulnar neuropathy and EMG study confirmed elbow as the site of injury. The risk is increased when patient's arm is fixed at side of body in the pronated position. However, the arms were kept in supination and were well padded. Proper positioning can reduce the incidence but cannot eliminate them since subclinical injury might occur to an already compromised nerve.^{5,6}

Other predisposing factors implicated for causing perioperative ulnar neuropathy such as male preponderance, diabetes, preexisting ulnar neuropathy, arthritis, instability of elbow joint were absent in our patient.³ Wijayshiri described a case of perioperative neuropraxia involving radial nerve and attributed it to hereditary neuropathy (HNPP). We, however, could not rule out this factor as genetic studies were not available in our institution. Defective armboard leading to brachial plexus injury was reported by Wong and Ward but no such mishap occurred in our case.⁷ The systemic factors involved in the pathogenesis of neuropathy such as hypovolaemia, dehydration, hypotension, hypoxia and hypothermia were also absent in our patient.

The symptoms presented two hours after surgery but it can be delayed for around 48hrs postoperatively. The patient being under the effect of sedation or

pain at the site of injury might ignore the neurological deficit in the immediate postoperative period. Conservative management was followed and the injury being mild (neuropraxia), healed completely over few weeks, but it may have persisted for longer.

Despite adopting adequate preventive measures, the injury occurred in a patient who had no predisposing factors. Its aetiology remains obscure. The question raised by Stoeltig several years ago "Is it a preventable complication?" still remains unanswered.⁸ However, it is pragmatic to take a thorough preoperative history and conduct a detailed examination, adopt all the precautions while positioning the patient to avoid contributing factors intraoperatively. Appropriate documentation of specific perioperative positioning actions is mandatory and post-operative examination of nervous system should be done to recognise the injuries early.

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