

Background

Peripheral nerve injury and brachial plexopathy are known, though rare complications of coronary artery surgery. The true incidence of nerve injury during general anesthesia remains unclear and probably is underestimated [1]. The ulnar nerve is most frequently affected accounting for one third of all nerve damages, whereas radial nerve lesions are much less common accounting for only 3% of such intraoperative injuries [2]. We report two cases of left radial nerve lesion during coronary artery surgery, presumably due to an external compression caused by a sternal retractor that is used for dissection of the internal mammary artery.

Case presentations

Case 1

A 52-year old obese man with known ischemic heart disease but no history of any neurological disease underwent coronary artery bypass surgery. Preoperative routinely performed diagnostic workup revealed no significant findings. During surgery he was laid supine on the operating table with both arms fully adducted to his side, fixed in the neutral position. Intraoperative monitoring included electrocardiography, pulse oxymetry and automatic blood pressure monitoring using a standard-size adult cuff affixed to the patient's right upper arm. No particular events occurred during anesthesia or surgery and recovery was good so that patient was transferred within a day from the intensive care unit to the normal ward.

However, on the first postoperative day he complained of wrist drop on the left. Neurological examination revealed a severe decrease in muscle power of the wrist and finger extensor muscles (0/5 MRC) and a slight brachioradialis paresis (4/5 MRC) accompanied by hypoaesthesia on the radial aspect of the dorsum mani. Biceps and triceps reflexes on the affected left arm were normoactive whereas the brachioradialis reflex was diminished. All muscles innervated from the median and ulnar nerve, as well as all the muscles above the elbow remained unaffected. The

clinical diagnosis of radial nerve injury was set and rehabilitation therapy was recommended.

After hospital discharge and about three weeks after surgery the patient was referred for neurophysiological evaluation. In the meanwhile the extensor muscles had already begun to improve. Nerve conduction studies of both radial nerves were performed using surface electrodes. Compound muscle action potentials (CMAP) were recorded from the extensor digitorum communis muscle. The opposite radial nerve was examined for comparison. Supramaximal nerve stimulation was achieved by gradually increasing the stimulation power until the point where the amplitude of the waveform did no longer increased was reached. Electrical stimulation at the elbow, below and above the spiral groove, revealed an amplitude decline of the CMAP that was indicative of a partial conduction block of the left radial nerve along the spiral groove, whereas CMAP recordings of the right radial nerve were normal (Table 1). Moreover, motor axonal loss due to wallerian degeneration distal to the site of the lesion was suggested by the low distal CMAP. Needle electromyography enhanced this finding by revealing moderate impairment in recruitment with fibrillation potentials in radial innervated muscles below the elbow and normal findings in both triceps and deltoid muscles. The motor unit potentials were normal, a finding that is consistent with a recent nerve injury. In conclusion, all electrophysiological findings were indicative of a radial nerve injury in the spiral groove. The involvement of the brachioradialis muscle and the fact that both deltoid and triceps muscles remained unaffected practically excluded the differential diagnostic alternative of a posterior interosseus neuropathy and a posterior cord brachial plexus lesion respectively.

Case 2

Another 50-year-old obese man was referred for neurological and neurophysiological evaluation one month after having undergone coronary artery bypass surgery. He also

Table 1: Electrophysiological studies performed in both cases on radial nerves bilaterally indicative of a partial conduction block of the left radial nerve along the spiral groove with additional distal motor axonal loss due to wallerian degeneration.

Examination	Left side		Right side	
	Patient 1	Patient 2	Patient 1	Patient 2
CMAP-stimulation at the elbow	5 mV	4.5 mV	7.5 mV	8 mV
CMAP-stimulation below the spiral groove	4.5 mV	4.2 mV	7.2 mV	7.5 mV
CMAP-stimulation above the spiral groove	1.6 mV	1.3 mV	6.8 mV	7.0 mV
SNAP	15 μ V	8 μ V	63 μ V	42 μ V

CMAP stands for Compound Muscle Action Potentials.

SNAP stands for Sensory Nerve Action Potentials