

Airway compromise due to irrigation fluid extravasation following shoulder arthroscopy

Sir,

Shoulder arthroscopy is a commonly used technique for treating injuries or pathologies of the shoulder joint such as supraspinatus tear, subacromial lesion, and recurrent dislocations. Arthroscopy can be performed under general anesthesia with regional block like interscalene block or continuous interscalene block. We report a case of airway complications due to fluid extravasation, which is rare but can be life threatening.

A 49 years old healthy male ASA 1 (American Society of Anesthesiology) patient was posted for right shoulder arthroscopy, after being diagnosed for tear of supraspinatus muscle. Patient had no history of any systemic illness and lab investigations were within normal limits.

Patient was pre-medicated with tablet Ranitidine 150 mg and tablet lorazepam 2 mg HS (*Hora Somni*) and in the morning 2 h before surgery. General anesthesia with endotracheal intubation and mechanical ventilation was planned and standard monitors were attached. 100 µg fentanyl and 1 mg midazolam was given IV and anesthesia induced with 100 mg propofol, and 6 mg pancuronium. Airway was secured with 8.5 mm cuff ETT (EndoTracheal tube) and intraoperative anesthesia was maintained with oxygen (33%) plus N₂O (66%) and propofol infusion at the rate of 100 µg/kg/min and ventilated with Bain's circuit.

Left lateral decubitus position was used during the surgery. The surgical procedure lasted for 3½ h. Ninety minutes after starting the procedure, patient developed tachycardia (upto 130 bpm) and hypertension (upto 150/100 mmHg). This persisted despite deepening of anesthesia and additional bolus of 50 µg of fentanyl. Other causes of tachycardia and hypertension such as hypoxia, full bladder (as the patient was not catheterized), drug reaction etc., were ruled out.

Normal saline was used as irrigation fluid with a mechanical pump. Infusion pump pressure was varying between 100 cm and 150 cm of water and flow of 150 ml/min.

After the surgery, extensive swelling was noted across the chest, right shoulder, right side of the neck and face [Figure 1]. Edema was extending up to the oral cavity such that the tongue was pushed to the opposite side [Figure 2].

Neuromuscular blockade was reversed and the ET tube was kept *in situ*. Inj. dexamethasone 8 mg. Inj. furosemide 20 mg. and 100 ml of 20% mannitol was given to treat the edema. After regaining spontaneous ventilation, patient was shifted to surgical ICU and connected to T-piece with oxygen and monitored. Sixteen hours after the surgical procedure the edema had subsided and the facial symmetry was restored [Figure 3].

After confirming that there was no airway compromise, trachea was extubated without any complication and kept under observation for further 12 h in SICU (Surgical Intensive Care Unit).



Figure 1: Edema of the face and neck



Figure 2: Oral cavity edema with tongue being pushed to the opposite side



Figure 3: Extubated patient after 16 h of surgery- facial symmetry restored

Although, airway complication occurs in 0.5-2% of cases, it can be life threatening if not recognized early and managed. Sub-acromial space is partially encapsulated and it communicates with various anatomical planes and leads to extravasation of fluid into surrounding soft-tissue, which can be potentially life threatening event,^[1,2] due to airway edema and also leading to tracheal deviation in certain severe cases.^[3]

In arthroscopy, fluid under pressure is used to distend a joint and make a working surgical space. Shoulder arthroscopy should be limited to 90-120 min as long duration leads to extravasation and airway edema.^[4] Maintaining the patient with ET tube *in situ* till the extravasated fluid is reabsorbed seems to be an effective method to manage such a case.

Anesthetic techniques such as GA (General Anesthesia) with endotracheal intubation with/without continuous interscalene block^[1] can be used. Advantage of GA is that the airway is secured and controlled hypotension can be given.^[1] Advantage of continuous interscalene block is that the patient is awake, and recovery is faster as GA and poly-pharmacy is avoided and post-operative analgesia can be given.^[1] However, if only regional technique is used, then chances of airway compromise are high.^[5-7]

Fluid gain on an average is about 3.2 l/27.4 min; hence, there is a strong correlation between fluid absorbed, weight gain and time taken for the surgery. Risk factors for extravasation of irrigation fluid are increased pump pressure,^[5] obesity, long duration of the surgical procedure,^[8] arthroscopy within the subacromial space, lateral decubitus position (gravity effect). However, there are other causes that can cause respiratory compromise in shoulder arthroscopy such as air embolism,^[9] tracheal compression by the extravasation of irrigation fluid.^[5,10]

Many of the cases reported so far have been found in

patients undergoing procedure under regional anesthesia and rare in patients under general anesthesia although it may not be related to technique of anesthesia *per se* the risk associated with the regional anesthesia cannot be understated as the airway is not secured.^[3,5] Timely intervention such as intubation maybe required in such case of fluid extravasation.

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