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LETTER TO THE EDITOR Open Access

Fast-track management of airway complications following shoulder arthroscopy

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To the Editor,

A 56-year-old female, controlled hypertensive with right shoulder rotator cuff tear, was planned for arthroscopic repair. Her preoperative investigations and general physical and airway examination were normal.

In the operating theatre, standard general anesthesia care with ultrasound-guided right brachial plexus block by interscalene approach was performed. The patient was placed in the left lateral decubitus position. Nitroglycerine infusion was started to provide a bloodless surgical field. Peak airway pressure showed an increasing trend with a baseline value of 18 cm H_2O prior to the start of surgery and gradually increasing to 30 cm H_2O by the end. Fifty-four liters of normal saline was infused into the surgical space at the pressure of 70 mm Hg over 85 min.

Postoperatively, when the patient was positioned supine and surgical drapes removed, widespread edema involving the lower face, tongue, neck, and chest was noted extending till the left shoulder but significantly more on the right side with neck circumference increased from a baseline of 32 to 41 cm. Due to the risk of airway compromise and difficult laryngoscopy, extubation was deferred. She was given iv fentanyl 25 μg, morphine 3 mg, and frusemide 5 mg and ventilated. Neck circumference was 36 cm, 35 cm, and 33 cm after 60, 90, and 120 min of postoperative ventilation, respectively, with a visible decrease in swelling and induration of the tongue, face, and chest. After she became fully awake with return of motor power, a cuff leak test was done and it was negative. Direct laryngoscopy was possible, and the patient's trachea was extubated. The patient was stable with no respiratory distress during postoperative recovery.

Shoulder arthroscopy is a minimally invasive technique which in comparison to open technique causes less postoperative pain and earlier rehabilitation. However, airway complications resulting from the use of irrigated fluid though rare can occur and can be life threatening if not recognized early and managed effectively. Risk is increased with long duration of surgery, sub-acromial pathology (sub-acromial space is unencapsulated), large volume of irrigation fluids, increased pump pressures, lateral decubitus position (due to the effect of gravity), obesity, and intraoperative hypertension (Antonucci et al. 2006; Manjuladevi et al. 2013; Khan et al. 2013; Chellam et al. 2015; Ko et al. 2015). Use of controlled pump pressures (40–80 mm Hg) and controlled flow rate of irrigation fluids (50–150 ml/min) with continuous outflow conduit, surgery duration limited to 90 to 120 min, and providing general anesthesia with secured airway have been shown to reduce complications (Antonucci et al. 2006; Manjuladevi et al. 2013; Khan et al. 2013).

Monitoring of neck circumference postoperatively, a positive cuff leak test with endotracheal cuff deflation at the end of the procedure, and checking for airway edema on direct laryngoscopy can help to detect the risk of airway obstruction (Antonucci et al. 2006; Manjuladevi et al. 2013; No et al. 2013). Bronchoscopy and ultrasound observation of fluid infiltration are other techniques which can detect tracheal compression (Manjuladevi et al. 2013; Gupta et al. 2016). In patients with clinical suspicion of airway edema, it is advocated to delay extubation as extensive cervicothoracic edema can limit neck mobility and impair visualization of the glottis, making reintubation difficult leading to overnight admission in ICU (Antonucci et al. 2006; Manjuladevi

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et al. 2013; Ko et al. 2015). In our patient, intraoperative monitoring of increased airway pressure and compliance and serial monitoring of neck circumference in the postoperative period along with the cuff leak test helped us to fast-track extubation with good recovery. We advocate routine use of these tests serially in the postoperative period in the operating theatre itself before extubation in centers performing shoulder arthroscopy to reduce the ICU occupancy rate in patients with suspected airway edema due to irrigated fluids.

Abbreviations
H_2O: Water; Hg: Mercury; iv: Intravenous; ICU: Intensive care unit

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Authors' contributions
VS participated in the intellectual content, review of the literature, and writing of the manuscript and has read and approved the final manuscript. RG participated in the intellectual content, conception, and design of this work as well as reviewing and editing the manuscript. She has read and approved the final manuscript and to take public responsibility for it and has agreed to be the corresponding author.

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