Airway oedema during shoulder arthroscopy: How we played it safe!

Sir,

Shoulder arthroscopy enjoys a popular status compared to an open shoulder technique due to its minimally invasive approach. However, what usually is considered as a relatively safe ambulatory surgery may pose vital airway related risks.

A 44-year-old male patient, 174 cm tall weighing 60 kg, with no known comorbid illnesses was posted for left shoulder arthroscopy and Bankart's repair for rotator cuff injury. His base line heart rate was 76 beats/min, noninvasive blood pressure was 116/76 mmHg and room air saturation was 99%. General anaesthesia was induced with IV propofol 200 mg, fentanyl 100 μg. His trachea was intubated after establishing muscle relaxation with IV vecuronium 6 mg and repeat doses of 1 mg were administered to maintain a train-of-four count of 0-1. General anaesthesia was maintained on IPPV with nitrous oxide (60%) and isoflurane (1-1.5%) in oxygen (40%) and a systolic blood pressure of 90-100 mmHg was targeted using the propofol infusion titrated between 50 μg/kg/min and 75 μg/kg/min through an infusion pump. Patient was positioned for surgery in right lateral decubitus with left upper limb in balanced suspension. Analgesia was supplemented with bolus doses of 50 μg of fentanyl every hour until the completion of surgery, which lasted for 3 h. Arthroscopic repair of the rotator cuff was performed using conventional four portal approach. Intra-articular pressure was maintained between 35 mmHg and 40 mmHg with transient increase to 40-60 mmHg using Stryker infusion system. Normal saline was used as the irrigation fluid totalling up to 20 L.

At the end of an uneventful surgery, a diffuse swelling was noticed over left shoulder, obliterating the supraclavicular and infraclavicular fossae on either side of neck encroaching upwards and anteriorly to involve thyromental region [Figures 1a and b]. Direct laryngoscopy revealed a distinct pharyngeal wall bulge and none of the laryngeal structures could be identified except a swollen tip of epiglottis. Considering these as premonitory signs of a possible airway compromise we conducted a leak test around the occluded tube by deflating the cuff after complete recovery from residual neuromuscular blockade. As expected, patient was unable to breathe spontaneously around the tube as

Figure 1a: Diffuse soft-tissue oedema around the neck and the face – lateral profile

Figure 1b: Diffuse soft-tissue oedema around the neck and the face – front profile

evidenced by the presence of paradoxical breathing pattern. Patient was shifted to a high dependency unit with an endotracheal tube *in-situ* and monitored while supplementing humidified oxygen via T-piece at 6 L/min in propped up position. A bolus dose of IV morphine 6 mg along with intermittent boluses of IV midazolam 1 mg ensured adequate sedation and tube tolerance. Within 8 h, the swelling subsided completely and the patient was extubated uneventfully.

Respiratory embarrassment related to shoulder arthroscopy however rare, have been reportedly produced by air embolism, tracheal compression, pneumothorax, complete airway obstruction, pleural effusion and negative pressure pulmonary oedema.[1-5]

Shoulder arthroscopic procedures are well-known to be associated with extra articular extravasation of irrigation fluid into the deltoid muscle and the chest.[6] The extravasated fluid is generally reabsorbed within 12 h yet high pump pressure, obesity, lateral decubitus position, prolonged duration of procedure, arthroscopy into subacromial space and glenohumeral capsular surgical rent are recognised risk factors for a possible inadvertent neck and upper chest soft-tissue oedema.[2,4,5,7] This case is unique due to the extensive soft-tissue oedema found spreading across the midline across the neck, upper chest soft-tissue involving the airway mucosa due to the leakage of irrigation fluid. Hence, what may seem as a common finding to a surgeon at the end of a regular shoulder arthroscopic procedure externally may have dire anaesthetic implications for us.

Airway oedema from extravasated fluid makes securing a definitive airway difficult because of obscured laryngeal view, compromised neck mobility and swollen glottic aperture as was seen in this case.[1,6] Even surgical airway has a diminished role due to a rigid and tense neck swelling.[4] Hence, we recommend general anaesthesia with endotracheal intubation to ensure a secure airway while giving us a chance at the end of surgery to identify signs of a possible airway oedema and anticipate post extubation airway compromise. Cases have been reported of patients developing post-extubation stridor since airway oedema was left unnoticed until after extubation.[4]

A possible life-threating airway complication was successfully averted only due to high index of suspicion and the decision to withhold immediate extubation.

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