Glottic and Subglottic stenosis following intubation during surgery

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Case Report
Glottic and Subglottic Stenosis Following Intubation During Surgery

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Summary
AN ADULT PATIENT developed glottic and subglottic stenosis following intubation during surgery. Prolonged mucosal ischaemia followed by infection in the region of the rigid laryngeal box was probably responsible.

A thirty-nine year old emaciated female Indian patient with gastric outlet obstruction of three months duration was initially managed by intrevenous drip and nasogastric suction for ten days. Initial investigations showed haemoglobin concentration 3.5 gm%, PCV of 14, serum sodium 120 meq/L, serum potassium 2.6 meq/L and chloride 90 meq/L. After blood transfusion, plasma transfusion etc, her general condition improved to a haemoglobin concentration 10.7 gm%, PCV 37, serum sodium 131 meq/L, potassium 3.4 meq/L and chloride 100 meq/L.

After premedication with atropine 0.3 mg, promethazine 12.5 mg, pethidine 40 mg, she was induced with oxygen, nitrous oxide, 4 mg pancuronium and intubated with a size 7.5 mm cuffed red rubber Rush endotracheal tube. The degree of inflation of the cuff was not recorded or remembered.

Ten minutes after onset of surgery, the blood pressure fell from 100 mmHg systolic to 40 – 50 mmHg with a thready and irregular pulse. The hypotension lasted 40 minutes. Blood pressure was restored by administration of whole blood 450 ml, hydrocortisone 200 mg, Rheomacrodex in Normal saline 250 ml, 75 ml of 7.5% sodium bicarbonate and 5 ml 5% calcium chloride. A second episode of hypotension lasting 25 minutes during the third hour of surgery and it responded to administration of 500 mg hydrocortisone, 450 ml blood, 200 ml of frozen plasma and 25 ml of 7.5% sodium bicarbonate.

The duration of surgery and anaesthetic was four hours. The recovery period in the recovery ward and the immediate post-operative course was uneventful. Histopathology showed a benign gastric ulcer.

One month following the operation, she complained of difficult and noisy respiration followed by recurrent episodes of upper respiratory tract infection.

Laryngogram and tomogram of the larynx showed a normal valleculae and cuneiform fossa. The vestibule was narrowed, measuring 1 cm in length, with loss of differentiation between the true and false vocal cords. The subglottic space was narrowed for a distance of 1 cm. The stenosis was mainly posterior, but also extended around the larynx to the front.

Direct laryngoscopy showed fibrosis in the inter-arytenoid region with the right vocal cord fixed and involved in the subglottic fibrosis.

Subsequent management was by tracheostomy (for respiratory distress due to upper respiratory infection) and Kenacort* injection of the stenotic area of the larynx under anaesthesia. Tracheostomy was allowed to close and there was no significant respiratory obstruction.

Discussion

The patient developed glottic and subglottic stenosis from the combined damaging effects of prolonged ischaemia of the rigid laryngeal box and cricoid ring from a relatively overinflated cuff and probably short endotracheal tube, episodes of prolonged hypotension during surgery, infection and poor reparative response of the patient to the effects of mucosal ischaemia.

It is advised that such ill patients should have the cuff just inflated or readjusted during anaesthesia such that a minor leak occurs. A pharyngeal pack acting as a sponge will be a useful adjunct.