Recurrence inspiratory stridor in a case of psoriasis due to post operative laryngospasm after Hemorrhoidectomy
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Abstract:
46 year old adult male, a case of chronic plaque psoriasis presented with grade III hemorrhoids and was posted for hemorrhoidectomy. Endotracheal general anaesthesia was preferred to central neuraxial blockade in this case and the course of surgery was uneventful. Patient was extubated at the end of the procedure. Laryngeal edema with recurrent laryngospasm was encountered in the post-operative period after tracheal extubation, which was successfully managed. Conduct of general anaesthesia for hemorrhoidectomy in this case has been elaborated.

Laryngospasm - its cause, risk factors, modes of prevention, diagnosis and management have been reviewed. Anaesthetic implications in a case of psoriasis have been discussed.
Introduction:

Psoriasis is a chronic inflammatory skin disease characterised by dermal papillary and epidermal hyperplasia. The lesions are usually distributed on the scalp, elbows, knees, sacral region and in some cases the entire integument including the oral mucosa, palms, soles and finger nails. Laryngospasm is a prolonged reflex closure of the glottis, often occurring with insufficient depth of anaesthesia and is managed with positive pressure ventilation, small intravenous doses of succinylcholine or lidocaine, decreasing or increasing the depth of anesthesia, or tracheal reintubation with extubation after the patient is fully awake or thoroughly suctioned. Laryngeal edema often manifests as post extubation stridor and is managed with parenteral corticosteroids, epinephrine nebulization and helium-oxygen mixture.

We present a case of recurrent postextubation laryngospasm and laryngeal edema in an adult male after endotracheal general anaesthesia for hemarrhoidectomy, a case of chronic plaque psoriasis.

Case Report:

A 46 year old man, 171 cm and 71 kg, a case of untreated chronic plaque psoriasis was scheduled for hemarrhoidectomy. Preoperative airway examination revealed an adequate mouth opening, hyoid – mentum distance of 6 cm and a Mallampati class II pharyngeal visualisation.

The patient reported that he had developed multiple small scaly erythemosquamous plaques over the elbows, knees and sacral region before 8 years which were treated irregularly and gradually enlarged to involve majority of the trunk and the upper limbs. Physical examination revealed multiple large erythemosquamous lesions occupying the scalp, lateral aspect of face, most of the anterior and posterior aspects of trunk including the upper limbs and the sacral region [figure 1]. Case was discussed with dermatologist and his opinion obtained. There was no evidence of any acute infection or inflammation related to psoriasis. Renal and liver functions were evaluated to be within normal limits.

Figure 1
Psoriatic plaques occupied most of the posterior aspect of trunk including the lumbosacral region and hence it was decided on endotracheal general anesthesia as the mode of anesthesia in order to avoid instrumentation of any kind to the psoriatic skin during the procedure of subarachnoid block. Intravenous access secured with the left cephalic vein where the skin was free of psoriatic involvement. Patient was premedicated with diazepam. Induction of anesthesia and endotracheal intubation were accomplished easily after the intravenous administration of thiopentone, fentanyl and vecuronium. Anesthesia was maintained with oxygen in nitrous oxide with sevoflurane. Surgery proceeded without complication and lasted for a duration of 50 min. Neuromuscular blockade was reversed at the end of surgery with neostigmine 2.5 mg and glycopyrrolate 0.5 mg.

With the patient responding to commands for eye opening and head lift (which could be sustained for > 10 sec), his pharynx was suctioned and trachea extubated. After a period of uneventful spontaneous breathing for two minutes, the patient had two stridorous breaths and pointed towards his throat, indicating he was unable to breathe. Suspecting inadequate reversal of muscle relaxant, neostigmine 0.5 mg and glycopyrrolate 0.1 mg was administered slow IV, but failed to relieve the stridorous breathing. Positive pressure ventilation was applied with bag and face mask without successful ventilation. Laryngospasm was suspected and it was tried to overcome with CPAP.

CPAP failed to open up the glottis and hence succinylcholine 75 mg was given at this point, and sevoflurane administered at 1 MAC. Laryngospasm terminated and positive pressure ventilation continued. Since the duration of neuromuscular blocking action of succinylcholine is prolonged by the administration of anticholinesterases, positive pressure ventilation was continued till the return of adequate spontaneous breaths. Spontaneous breathing returned slowly, sevoflurane was gradually cut down.

After 2 min of spontaneous breathing which consisted of 500 – 600 ml breaths at a rate of 12 – 15/min, the patient again went in for stridorous breathing. Positive pressure ventilation with bag and face mask was applied, again unsuccessful in ventilating the patient. Succinylcholine 100 mg was repeated at this point with lidocaine 50 mg intravenously. Calcium gluconate 10 ml administered slowly intravenous suspecting hypocalcemia as a cause of repeated laryngospasm. Anesthesia deepened with sevoflurane at 1 MAC being administered. At this point direct laryngoscopy was done which revealed a clean and dry pharynx and laryngeal inlet without injury or foreign material. Sevoflurane slowly titrated down Spontaneous breathing returned and patient was placed on supplemental oxygen by mask.

The patient was awake, alert and conversant. After 2 minutes again went in for partial laryngospasm for the third time.
The anesthesia team suspected inadequate pain relief and glottic edema as the cause of recurrent inspiratory stridor and administered intravenous fentanyl 60 mcg. Positive pressure ventilation with bag and mask applied. The anesthesia team considered nebulisation with adrenaline 500 mcg. Patient showed significant improvement within 2 minutes of the start of adrenaline nebulisation and fentanyl administration. Spontaneous breathing returned at a volume of 500-700ml/breath and a rate of 14–18/min. Patient had no further episodes of laryngospasm and was transferred to PACU. Upon arrival in the PACU our patient was awake, alert and conversant and further course of management was uneventful.

Discussion:

Our patient presented preoperatively with multiple erythematous plaques all over the trunk which was diagnosed as chronic plaque psoriasis. Since psoriatic lesions are commonly associated with Staphylococcus aureus infections, central neuraxial blockade or instrumentation of any kind was avoided in these areas and it was decided to conduct the surgery with endotracheal general anaesthesia as the mode of anaesthesia. Surgery proceeded uneventfully with the trachea being extubated at the end of surgery. Post extubation the patient encountered stridorous breathing. Positive pressure ventilation was administered and auscultation revealed decreased air entry with no wheeze. Hence bronchospasm was ruled out. Chest movements were observed and bag movements were decreased in magnitude leading to a mismatch between the patient’s respiratory effort and the extent of bag movements. Laryngospasm was suspected and subsequently managed with CPAP application and intravenous succinylcholine and sevoflurane being administered at 1 MAC. The patient was relieved of his stridorous breathing shortly, but soon encountered a second episode of stridorous breathing which was again managed with CPAP application and intravenous succinylcholine and intravenous lidocaine with sevoflurane. Suspecting hypocalcemia as a cause of recurrent laryngospasm intravenous calcium was administered at this point. Stridorous breathing again recurred for the third time. Since hemorrhoidectomy surgeries done under general anesthesia could be complicated by severe post operative pain, pain was suspected as a cause for his recurrent stridorous breathing and an additional dose of fentanyl was administered. Systemic variants of psoriasis can present with systemic scaling and cartilaginous degeneration with smaller glottis due to edema, and hence an additional component of laryngeal edema which also contributed to his recurrent stridorous breathing was suspected and adrenaline nebulisation was administered. Patient showed significant improvement and there no further episodes of stridorous breathing and the further course of management was uneventful.
LARYNGOSPASM

Laryngospasm is a protective reflex closure of the glottis as a result of abnormal stimulus at light plane of anesthesia, mediated by the superior laryngeal nerve [1]. Persistent laryngospasm may lead to hypoxia and hypercapnia, cardiac arrest, arrhythmia, pulmonary edema and bronchospasm [2]. Risk factors: Risk factors are classified into: (i) anesthesia related, (ii) patient related and (iii) surgery related factors[1]. (i) The most important anesthesia related risk factor is stimulation in light plane of anaesthesia [3]. Desflurane, among the volatile anaesthetics has the highest incidence of laryngospasm (50%) [4]. (ii) The most important patient related risk factor is young age along with URI and hyperactive airway [2,5]. (iii) Surgeries predisposing to laryngospasm consist of airway procedures including bronchoscopy, esophageal endoscopy, tonsillectomy and adenoidectomy [6].

Recognition: Is by various degrees of airway obstruction including paradoxical chest movement, intercostal recession, tracheal tug, and a characteristic crowing noise heard in partial laryngospasm. Prevention: (i) In the preoperative phase, a thorough history of URI, passive smoking, reactive airway disease and snoring should be sort [7]. (ii) During the induction phase, the use of anticholinergics and inhalational induction in pediatric patients using halothane or sevoflurane may decrease laryngospasm [8]. (iii) During the emergence phase, suctioning the oropharynx, and an artificial cough to decrease laryngospasm consists of positive-pressure inflation of the lungs just before extubation to expel the remaining secretions. Management: A number of ways exist including IV and topical lignocaine to the vocal cords [9], magnesium sulphate and acupuncture. Two noteworthy techniques are—(i) pressure in the laryngospasm notch, and (ii) pull of the Mandible. Bilateral superior laryngeal block interrupts the reflex arc, by dissipation of the stimuli causing the laryngospasm [10]. Clear airway should be maintained with 100% oxygen with CPAP and avoiding further instrumentation of the airway until the cords relax. Refractory laryngospasm is treated with IV agents such as succinylcholine (1–2 mg / kg) with atropine (0.02 mg/kg), and propofol (0.5–0.8 mg/kg), less frequently doxapram and nitroglycerine [11, 12].

POST EXTUBATION STRIDOR

Laryngeal edema is a frequent complication of intubation and presents shortly after extubation as stridor. Parenteral corticosteroids, epinephrine nebulization and helium–oxygen mixture are effective in treating laryngeal edema [13].
PERIOPERATIVE ANAESTHETIC CONSIDERATIONS IN A CASE OF PSORIASIS

Renal and liver function should be assessed preoperatively and stress dose corticosteroids provided [14]. Staphylococcus aureus is found in the psoriatic lesions [15]. Regional anesthesia at these sites may lead to septicemia. Intraoperatively, trauma of any kind to psoriatic skin should be avoided because psoriatic plaques can be elicited artificially by inducing trauma to the skin [14], an isomorphic response referred to as Koebners phenomenon. Erythroderma variant of psoriasis is characterized by generalized erythema and scaling [15], which may complicate endotracheal tube placement and lead to laryngeal edema [16]. Pustular psoriasis is accompanied by relapsing polychondritis, which can complicate intubation due to reasons such as cartilage degeneration and a smaller glottis due to edema [17].

Conclusion:

Anaesthetic considerations of psoriasis should involve thorough preoperative evaluation of all organ systems. Securing the airway may be complicated in systemic variants of psoriasis due to laryngeal cartilage degeneration and smaller glottis with glottic edema which may commonly present as post extubation inspiratory stridor and may lead to respiratory failure due to airway obstruction. Identifying the risk factors and taking the necessary precautions are key points in preventing laryngospasm and laryngeal edema in a patient with psoriasis.

References:

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