ORIGINAL RESEARCH PAPER

Volume-8 | Issue-4 | April-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ANAESTHETIC MANAGEMENT FOR OPEN SUPRA-PUBIC CATHETERISATION IN A CHILD WITH LARYNGEAL WEB : A CASE REPORT

Anaesthesiology

Dr. Tulsi K Patel Resident, Department of Anaesthesiology, Krishna Institute of Medical Sciences, Karad, Maharashtra

Dr. Harshali Patil* Senior Resident, Department of Anaesthesiology, Krishna Institute of Medical Sciences, Karad, Maharashtra *Corresponding Author

Dr. Vithal K Dhulkhed Professor and Head, Department of Anaesthesiology, Krishna Institute of Medical Sciences, Karad, Maharashtra

Dr. Avinash Dubey Senior Resident, Department of Anaesthesiology, ESI hospital, Jhilmil, Delhi

Dr. Nasrat Imam Resident, Department of Anaesthesiology, Krishna Institute of Medical Sciences, Karad, Maharashtra

ABSTRACT

INTRODUCTION: Endotracheal intubation in a child with laryngeal web is a difficult challenge to the anaesthesiologist. We report the use of spinal anesthesia in a child with laryngeal web to avoid the difficult airway-related complications.

CASE REPORT: A 5 years old child weighing 9.8 kg came with history of posterior urethral valve and posted for open suprapubic catheteriasation. Patient had stridor since 3 months. Patient had undergone multiple surgeries previously under general anaesthesia. Microlaryngoscopy was suggestive of supraglottic stenosis and anterior laryngeal web with vocal cord oedema. X-ray chest was suggestive of right sided tracheal deviation. On the day of surgery, patient was premedicated with intramuscular (ketamine/midazolam/glycopyrolate); (50mg/1mg/0.04mg). Spinal anaesthesia was administered with hyperbaric bupivacaine 0.5% 0.8 CC at L4-L5 intervertebral space. Adequate spontaneous mask ventilation was ensured by providing O2 and air through Jackson Rees circuit . The child was monitored in the postanesthesia care unit for four hours and later sent to the ward. He was discharged from the hospital uneventfully.

CONCLUSION: Spinal anesthesia is a safer option in a child with a difficult airway to reduce the complications related to difficult endotracheal intubation and ventilation. Difficult airway trolley and smaller size ETTs should always be kept ready at hand in case of any complication.

KEYWORDS

Difficult airway, Laryngeal web, Spinal anaesthesia

INTRODUCTION

Endotracheal intubation in a child with laryngeal web is a challenge to the anaesthesiologist. The aim of management in patients with difficult airway is to mainatin the airway patency and to ensure adequate ventilation. We report the use of subarachnoid block in a child with anterior laryngeal web & supraglottic stenosis to minimise the difficult airway related complications.

CASE REPORT

A five years old male baby, weighing 9.8 kg was diagnosed with posterior urethral valve, posted for open supra-pubic catheterization. A history of noisy breathing was present since 3 months. No history of any medical illness was present. Patient had undergone exploratory laprotomy for pyloric atresia at the age of 3 days, circumcision & bladder stone removal at the age of 1 year, cystoscopy 6 to 7 times since the age of 1 year under general anaesthesia. No significant birth history was found. General examination and systemic examination was within normal range. Mouth opening was adequate with Mallampati grading-2. Microlaryngoscopic examination showed supraglottic stenosis and anterior laryngeal web with vocal cord oedema [Fig.1]. USG abdomen & pelvis examination showed severly thickened & trabeculated urinary bladder wall suggestive of bladder outlet obstruction with dilated bilateral pelvicalceal systems and ureters as well as urinary bladder sludge. X-ray C-spine showed right sided tracheal deviation [Fig.2].

A child was fasted for 6 hours. An informed written consent was obtained and child was premedicated wih intramuscular (ketamine/midazolam/glycopyrolate) (50mg/1mg/0.04mg). A 24 gauge IV cannula was inserted at the dorsum of hand. ECG, non-invasive blood pressure and pulse oximeter monitoring were instituted. Thereafter, under aseptic precautions lumbar puncture was performed with 25 gauge Quincke's spinal needle using a midline approach with the patient in lateral position at L_4-L_5 intervertebral space. After free flow of cerebrospinal fluid, spinal anaesthesia was administered with hyperbaric bupivacaine 0.5% 0.8 CC. Adequate spontaneous mask ventilation was ensured by providing O_2 through Jackson-Rees circuit. The surgery lasted for one hour and intraoperative period went uneventful. The child was monitored in the postanesthesia care unit for four hours and later sent to the ward. He was discharged from the hospital uneventfully.

DISCUSSION

Difficult airway remains the greatest challenge faced during the administration of anaesthesia. Maintaining a patent airway is essential for adequate oxygenation and ventilation, and failure to do so even for a brief period of time can be life threatening. Early recognition that a patient's airway may be difficult to manage allows the clinician to plan the anesthetic to minimize the potential for serious airway-related morbidity. Pediatric airway lesions can lead to significant airway compromise and are best approached with a team effort between the anesthesiologist and surgeon.

Laryngeal web is a rare condition consisting of a membrane-like structure that extends across the laryngeal lumen close to the level of the vocal cords. Its most common anatomic localization is at the level of the glottis extending across the anterior one third of the vocal cords.[1] A congenital web results from incomplete recanalization of the primitive larynx during the tenth week of embryogenesis.[2] It can be acquired secondary to a surgical procedure, long-term intubation, or infection.[1] Supraglottic stenosis is an unusual subset of laryngotracheal stenois which is often associated with external-beam radiation or autoimmune disorders.

Two classifications are currently used for staging : Cohen's and Benjamin's, which are being designed for congenital lesions. Most common classification is Cohen's classification. It defines 4 types depending on the degree of glottic narrowing [Fig.3]. Type 1 anterior webs involve 35% or less of the glottis and are of uniform thickness and free of subglottic extension. Type 2 webs involve 35%to 50% of the glottis and may be thin or moderately thick. Type 3 webs involve 50% to 75% of the glottis and are usually thick anteriorly and thinner posteriorly. Type 4 webs involve 75% to 90% of the glottis, are uniformly thick, have vocal cords that are not identifiable, and have a subglottis lumen that is narrowed by the thickness of the web extending inferiorly. It should be noted that types 2 and 3 may extend into the subglottis and have anassociated subglottic stenosis.[4]

Laryngospasm and laryngeal edema are common causes of postextubation upper airway obstruction in children.[5] The effects of a narrowed airway are an extremely important issue when understanding the evaluation and treatment of patients with airway lesions. Flow through any enclosed tube is governed by Poiseuille's Law:

$$Q = \frac{\pi r^4 P}{8\eta L}$$

Where Q = flow through the tube, r = radius of the tube, L = length of the tube, and η = viscosity of the flow material.

One can see from the equation that flow (Q) is directly proportional to the radius of the tube to the fourth power. This means that an incremental change in the radius of the tube will change the flow rate exponentially. Indeed, it has been found that a 1 mm decrease in the diameter of the neonatal subglottis, which is normally 4 mm, results in as much as a 60% decrease in airflow. Another effect of a narrowed airway is the increased risk of injury resulting from intubation or surgery.[6]

Endotracheal intubation in neonates can lead to subglottic edema, especially common after traumatic intubation or those lasting longer than one hour.[7] Subglottic edema of 1 mm in neonates can reduce the laryngeal cross-section by 35%. Patients with congenital or acquired airway pathology are known to have difficult extubation and difficult reintubation.[8]

Spinal anesthesia is a safer option in a child with a difficult airway to reduce the complications related to difficult endotracheal intubation and ventilation.[9] However, technical difficulties, procedural complications, longer duration of surgery can make it imperitive that the airway is secured so difficult airway trolley with smaller size ETTs should always be kept ready.

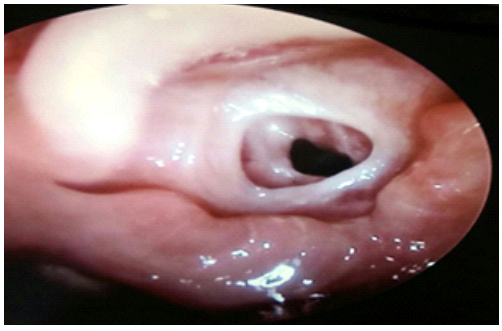

Fig.1. Microlaryngoscopic Examination

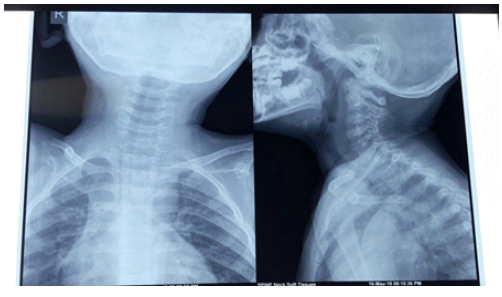

Fig.2. X-ray C-spine AP & Lateral view

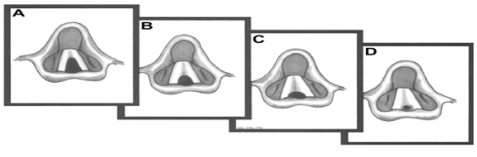

Fig.3. [A] Type 1 Laryngeal web (0 to 35%), [B] Type 2 Laryngeal web (35 to 50%), [C] Type 3 Laryngeal web (50 to 75%), [D] Type 4 Laryngeal web (75 to 90%)

CONCLUSION

It is imperative to perform a detailed history, physical examination, and characterization of the extent and severity of stenosis. Spinal anesthesia is a safer option in a child with a difficult airway to reduce the complications related to difficult endotracheal intubation and ventilation. We conclude that before considering regional anaesthesia in a patient with difficult airway, an anaesthesiologist must have a preformulated strategy for intubation. Difficult airway trolley and smaller size ETTs should always be kept ready at hand in case of any complication.

REFERENCES

[1] Desuter G, Veyckemans F, Clement de Clety S, Anslot C, Hamoir M. Laryngeal web as a cause of upper airway obstruction in children. Pediatric Anesthesia. 2004 Jun;14(6):528-9.
[2] McGill TJ. Congenital anomalies of the larynx. In: Ferlito A, editor. Diseases of the larynx.Arnold Publisher; (London): 2000; vol. 16. ch. p. 207–215.
[3] Stevens MS, Chang A, Simpson CB. Supraglottic stenosis: etiology and treatment of a rare condition. Annals of Otology, Rhinology & Laryngology. 2013 Mar;122(3):205-9.
[4] Cohen SR. Congenital glottic webs in children. Ann Otol Rhinol Laryngol 1985; 94(Suppl 121):1–16.
[5] Olsson GL, Hallen B. Laryngospasm during anesthesia. A computer-aided incidence study in 136,929 patients. Acta Anaesthesiol Scand. 1984;28:567–75.
[6] Ida JB, Guarisco JL, Rodriguez KH, Amedee RG. Obstructive lesions of the pediatric subglottis. The Ochsner Journal. 2008 Sep;8(3):119-28.
[7] Darmon JY, Rauss A, Dreyfuss D, Bleichner G, Elkharrat D, Schlemmer B, et al. Evaluation of risk factors for laryngeal edema after tracheal extubation in adults and its prevention by dexamethasone: A placebo-controlled, double-blind, multicenter study. Anesthesiology. 1993;78:609–10.
[8] Karmarkar S, Varshney S. Tracheal extubation. Contin Educ Anaesth Crit Care Pain. 2008;8:214–20.
[9] Pai RB, Desai S, Rao R, Annigeri V, et al. Spinal anesthesia for hernia surgery in a child with laryngomalacia 2013 Jan-Mar; 7(1): 98–99.