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Anaesthetic management of tracheal polyp resection in a child. A case report

S. Deka, S. Gaiwal

Department of Anaesthesia Lilavati Hospital and Research Centre, Mumbai, India

Corresponding author: S. Deka, Department of Anaesthesia Lilavati Hospital and Research Centre, Mumbai, India. Email: deka_sangeeta17@yahoo.in

Key points

Tracheal polyps, which are usually benign tumors can cause symptoms of obstruction. Resection of a large polyp bronchoscopically poses a great challenge in itself. Anaesthetic management becomes critical and challenging as the airway is shared between both the surgeon and the anaesthesiologist. The anaesthesiologist must be well prepared to face any adverse event such as occlusion of airway by excised polyp, bleeding or even tracheal perforation.

Abstract

Tracheal polyp is an inflammatory usually a myofibroblastic tumor with unpredictable biological course commonly affecting paediatric and young patients. It may be asymptomatic or can cause symptoms of airway obstruction. Treatment is resection of polyp either bronchoscopically or surgically. Distal polyps with peduncalated stalks can create a "ball valve" mechanism within the mainstem bronchus. Anaesthetic management presents a unique challenge as the airway is shared by both anaesthesiologist and the surgeon. We report a case of tracheal polyp just above the carina in a 5 year old child. Due to its size and location, bronchoscopic resection was unsuccessful. Therefore at later stage, the polyp was resected after median sternotomy and tracheotomy during apneic phase in general anaesthesia.

Keywords: Tracheal polyp resection, airway management, paediatric patient, median sternotomy.

Introduction

Tracheal polyp which is usually an inflammatory myofibroblastic tumour, popularly known as inflammatory pseudotumour, is a rare (0.04–0.7% of all lung and airways tumors)[1, 2] solid lesion with an unpredictable biological course, usually affecting paediatric and young patients. The most accredited pathogenetic hypothesis imply an inflammatory reaction to trauma, autoimmune reaction or infectious process. Tracheal polyp may be asymptomatic or can cause symptoms of airway obstruction like cough, wheezing, breathlessness[3]. Treatment is resection of polyp either bronchoscopically or surgically. Distal polyps with a pedunculated stalk can create a “ball valve” effect within the mainstem bronchus, which may require median sternotomy or thoracotomy to gain access for definitive treatment.[4] Anesthetic management is very challenging in these cases where the airway is shared by both anesthesiologist and surgeon.

Case report

A 5 year old 13 kg boy was admitted with respiratory distress, recurrent wheeze associated with cough and fever. Patient was diagnosed with bronchial asthma at the age of 10 months for which he was being treated but the symptoms persisted. Respiratory examination revealed presence of bilateral rhonchi. High resolution com-

puted tomography (HRCT) done to exclude interstitial lung disease revealed a pedunculated polyp (1.2x1.1 cm) on posterior wall of trachea just proximal to the bifurcation. Patient was posted for excision of polyp by rigid bronchoscopy using ventilating bronchoscope under general anaesthesia (Figures 1, 2). Paediatric airway cart and jet venturi were kept ready. Preoperatively patient was nebulized with budecort and adrenaline. In operating room (OR), monitors were attached and patient was preoxygenated. Using 22G intravenous cannula glycopyrrolate 50 mcg and fentanyl 30 mcg was given. Anaesthesia was induced with Propofol 10 mg and succinyl choline 15 mg. After mask ventilation with oxygen-sevoflurane and confirming 100% oxygen saturation, patient's airway was handed over to the surgeons. A 4.8 mm rigid bronchoscope was introduced which was connected to Jackson Rees breathing circuit. Chest rise and capnograph confirmed adequacy of ventilation. The tracheal polyp was visualized just above the carina. Due to its large size, the electrocautery snare was not negotiable around the polyp. Several attempts were made to resect the polyp but were unsuccessful. As the procedure was taking longer time, we gave Atracurium and continued ventilation. IV dexamethasone was given to prevent tracheobronchial edema.

The rigorous and unsuccessful trials resulted in active bleeding. As location of the polyp was very critical, after controlling bleeding and thorough suctioning the procedure was abandoned. As soon as the rigid bronchoscope was removed, patient's trachea was intubated with 5.0 mm cuffed endotracheal tube (ETT) and positive pressure ventilation continued. Neuromuscular blockade was reversed with iv neostigmine and glycopyrolate (0.65mg+0.1mg). After careful suctioning of airway, trachea was extubated and sprayed with 10% lignocaine. Decision to resect the polyp at later stage after median sternotomy and tracheotomy was made.

On the day of surgery, after attaching the monitors, preoxygenating with 100% O_2, anaesthesia was induced with IV fentanyl, midazolam, propofol and atracurium. Trachea was intubated with 5.0 mm cuffed flexometallic ETT and anaesthesia maintained with O_2 , Air and Sevoflurane with intermittent doses of Atracurium. 18G epidural catheter was placed at thoracic level (T6-T7) and infusion of 0.1% Bupivacaine with 2 mcg/ml fentanyl started. Central venous access was secured with 5Fr double lumen catheter in right internal jugular vein under ultrasound guidance.

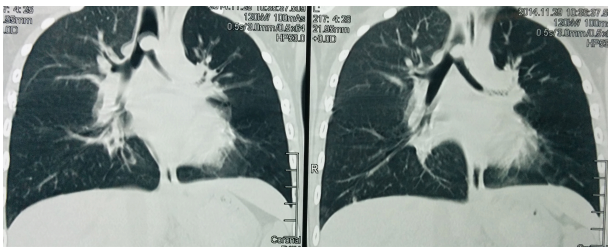

Fig. 1. HRCT images of thorax showing tracheal polyp just above the tracheal bifurcation.

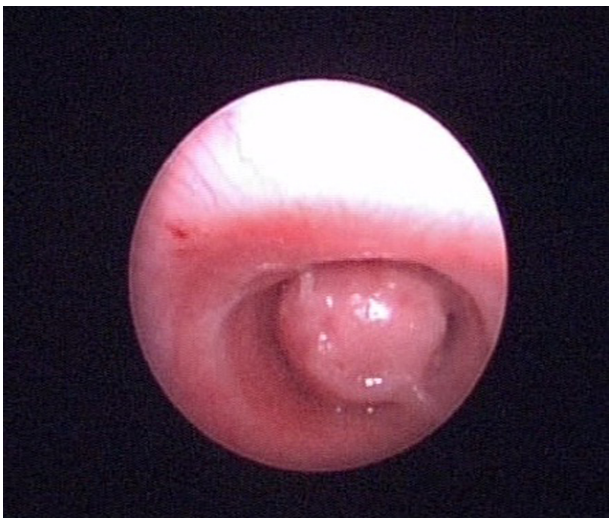

Fig. 2. Bronchoscopic view of the tracheal polyp above the carina and almost occluding the tracheal lumen.

Surgery proceeded with midline chest incision and median sternotomy. The plan was to do tracheotomy and resect the polyp during apnea. Another 5.0 mm cuffed flexometallic ETT was kept ready with surgeons to tide over the crisis in case of bleeding so that if needed the ETT can be passed through the tracheal opening. Just before tracheotomy ETT was withdrawn by 1 cm. After taking stay sutures, trachea was opened and by using bipolar cautery polyp was removed. There was no significant bleeding. While closing the trachea, to allow ven-

tilation intermittently to maintain patient's saturation, surgeons just approximated the stay sutures on tracheal wall. Trachea was closed and ventilation resumed. Surgery proceeded smoothly without any significant changes in hemodynamics and oxygen saturation. Total blood loss was approximately 100 ml. Anaesthesia was reversed with IV neostigmine and glycopyrrolate and trachea was extubated. Patient was shifted to paediatric intensive care unit for observation. Post-operative period was uneventful. Histopathology report of the polyp was myofibroblastic tumour.

Discussion and conclusion

Approximately 80% of primary tracheal tumours are malignant, the remaining benign lesions consisting of recurrent papillomatosis (most frequent), lipoma, fibroma, leiomyoma, hemangiomas and polyps [4]. Although endotracheal polyps are very rarely found, they should be included in the differential diagnosis of partial or complete obstruction of tracheo-broncheal tree.[4,5] . Individuals with endotracheal polyps are often misdiagnosed as suffering from obstructive pulmonary diseases like asthma and treated for long periods.[6] Patients can be asymptomatic or present with dyspnea which might be progressive, occurring only on exertion or intermittently. Generally dyspnea on exertion occurs when tracheal lumen is smaller than 8 mm and dyspnea at rest when it is smaller than 5mm.[6]

Treatment of tracheal polyp varies according to the size, presence of symptoms and viability of performing bronchoscopic procedures.[4] In most cases large symptomatic lesions can be extirpated through bronchoscopic procedures like curettage, laser, electro-cauterization or cryosurgery. Thoracotomy or sternotomy is rarely necessary.[4,6,7]

Anaesthetic management is critical specially during bronchoscopic procedure due to sharing of the airway by both surgeons and anaesthesiologists. The anaesthesiologists must be well prepared to face any adverse event such as accidental occlusion of the airway by excised polyp, bleeding into the tracheobronchial tree, tracheal trauma or perforation during cryo cautery etc. In our case, location of the polyp was very critical. During bronchoscopy, due to repeated attempts there was a possibility of edema and obstruction of the airway. The polyp being just above the carina , even tracheostomy wouldn't have been of help. The only possible means of ventilation in such scenario could be jet ventilation. During immediate post-operative period close observation and vigilance is very important as airway irritation can result in incessant cough and desaturation. Spraying the cords with 10% lignocaine helps significantly for the same.

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