Case study

UNUSUAL AETIOLOGY OF VOCAL PROCESS GRANULOMA IN A CHILD

Abstract

Background

Vocal cord granuloma commonly arises following trauma or irritation from endotracheal intubation and reflux disease. Other uncommon causes are granuloma following voice abuse and foreign body in the larynx. Vocal process granuloma has however not been reported following blunt anterior neck trauma.

Case presentation

We present a case of vocal cord granuloma following an anterior neck trauma. The patient is a seven year old boy who presented with persistent hoarseness and stridor post neck injury of three months duration. Systemic steroid has been used prior to presentation with temporary improvement. The direct laryngoscopy done under general anaesthesia revealed masses on both vocal processes, which were successfully excised surgically. There was total resolution of presenting complaints after surgery with no symptoms suggestive of recurrence six month post operation.

Conclusion

Post intubation and laryngopharyngeal reflux disease are common causes of vocal process granuloma. However, there is need to suspect granuloma formation following blunt anterior neck trauma for immediate conservative management avoiding the need for surgical intervention when patient present with upper airway obstruction.

Keywords: Vocal process granuloma, Larynx, Trauma, Pediatric.

Introduction

Laryngeal granulomas are benign, pale, rounded growth resulting from either intrinsic trauma or irritation of the larynx. Granulomas of the vocal process have gender equality and results from many aetiologies[1]. Some of the common aetiologies are trauma or irritation from prolonged intubation, laryngopharyngeal reflux disease, resulting in acid laryngitis and vocal abuse from chronic cough, loud speaking or singing and habitual throat clearing [1,2]. Vocal process granuloma has been documented to be the most common in Intubation related cases[2] Laryngeal granuloma can also be divided into nonspecific and specific. The nonspecific ones are those due

to intubation, laryngopharyngeal reflux and vocal abuse while the specific ones are those caused by disease like tubercular laryngitis and syphilis[3]. Development of contact granuloma can also be enhanced by smoking, allergy, infection, postnasal drip, and habitual throat clearing.

Vocal granulomas are usually found on the vocal process of the arythenoid cartilage located at the posterior aspect of the vocal fold. This is because this area is prone to repeated trauma due to the impact from the opposite vocal cord.

The granuloma following intubation is commonly seen when intubation is prolonged for 24 hours or more[4]. Although there were fewer documented vocal cord granuloma in patients intubated for less than 24 hours.

Patients with vocal cord granuloma present with hoarseness, foreign body sensation in the throat, pain during phonation and hawking while the additional symptoms seen in patients with bulky vocal cord granulomas are stridor and dyspnoea[5]. There is need to visualize larynx in patients with hoarseness of over three weeks. The mass will be seen on diagnostic laryngoscopy done as clinic procedure but in younger children, where flexible laryngoscopy is not available, this is done under general aneasthesia. The mass can also be visualized on CT scan and MRI in children before undertaking the direct laryngoscopy.

The treatment of Laryngeal granuloma can be non-surgical and or surgical. The non-surgical management is done as first line of treatment in most cases while surgical clearance is done in persistent granuloma, following failure of conservative treatment. The non-surgical treatments are voice rest, voice therapy, anti-reflux medication (proton pump inhibitors), intralesional, inhaled or systemic steroids and botulinum toxin [6].

For better surgical outcome, microlaryngeal surgery is done to reduce further trauma to the vocal cord, resulting in persistent hoarseness. A retrospective study done by Lee et al. where analysis of 590 cases of contact granuloma was done, the response rate of the various treatment options: observation- 20.5%, steroid- 31.6%, PPI was 44%, voice therapy was 44.3%, surgery was 60% and botulinum toxin was 74.2%. [7]

Conservative treatments were found to take longer periods before the lesion resolves completely but have lesser percentage of recurrence. While surgical management alone has been found to have higher percentage of recurrences unless combined with conservative treatment[5]. Ezzat et al, reported that the result of recurrence following the treatment of vocal process granuloma varies with the aetiology with post intubation granulomas accounting for 14.3%, reflux oesophagitis was 61.9%, 9.5% was found in vocal abuse and 14.3% in idiopathic causes[8].

Case Report

7-year-old boy presented with 3 months history of stridor and hoarseness

Symptoms developed following blunt anterior neck trauma at school. He was on the playground in school when a swing was said to have hit the anterior part of his neck while playing.

He developed stridor and hoarseness shortly afterwards. Patient also developed snoring and excessive salivation about 2 weeks after injury with occasional cough. There was no associated history of difficulty in breathing, foreign body sensation in the throat, dysphagia, and odynophagia since onset.

At the onset of symptoms, he was taken to a private health facility where he was nebulized with bronchodilator and some medications (systemic steroids and antibiotic) were administered for about a week which gave temporary relief of symptoms. Patient however presented to our facility due to persistent hoarseness and worsening of stridor.

On examination, patient was stridulous with flaring of alae nasi and significant depression of the suprasternal notch on supine position however there was no evidence of cyanosis and was well hydrated.

On neck examination there was a skin fold around a scar on the anterior neck just below the laryngeal prominence with mild tenderness. On palpation no emphysema, laryngeal credits and neck mass was felt. (Figure 1). All vital signs were essentially normal

Fibre-optic laryngoscopy was attempted in the clinic. However, the patient did not tolerate it. CT scan report revealed laryngeal narrowing with a soft tissue lesion at the glottic region (Figure 2) with assessment of laryngeal stenosis secondary to blunt laryngeal trauma was made.

Emergency tracheostomy and direct laryngoscopy was done a day after admission to excise the laryngeal soft tissue mass.

Direct laryngoscopy revealed polypoid masses arising from the posterior ends of both vocal folds (figure 3) obstructing 90% of the glottic space. Masses were completely excised (figure 4) and he was commenced on systemic steroid, antibiotics and Proton Pump Inhibitor. Patient was decannulated successfully third day post-surgery with total resolution of stridor and hoarseness. Clinic follow up evaluation did not reveal clinical features indicating recurrence 6 months post-surgical excision.

Histopathology of surgical specimen: features consistent with granulation tissue (polypoid soft tissue partly covered by stratified squamous epithelium) figure 5. Tissue is oedematous with myxoid areas. There are numbers of vascular channels and inflammatory cells (figure 6).

Figure 1: Significant depression of the suprasternal notch and a skin fold around the neck scar

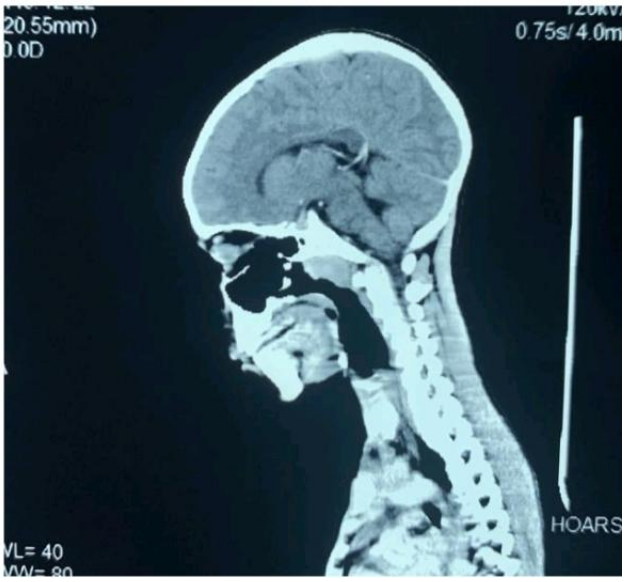

Figure 2: CT scan of the larynx and trachea revealed soft tissue mass in the glottic, and area of subglottic narrowing.

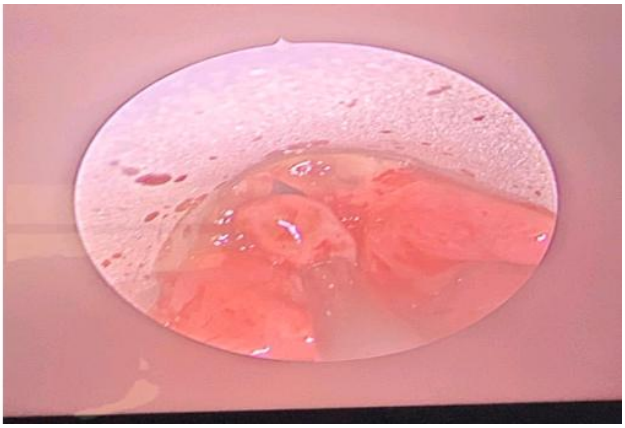

Figure 3: showing polypoid mass at the posterior end of both vocal cords

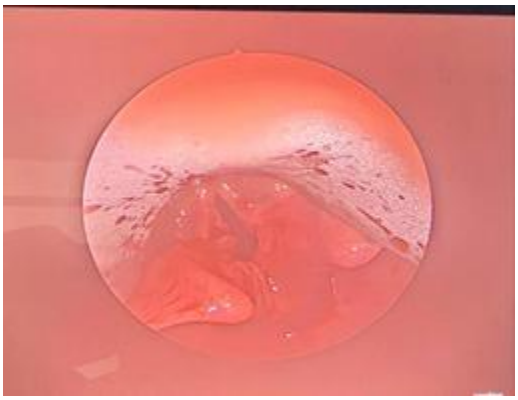

Figure 4 showing vocal cords after excision of the polypoid masses on the vocal processes.

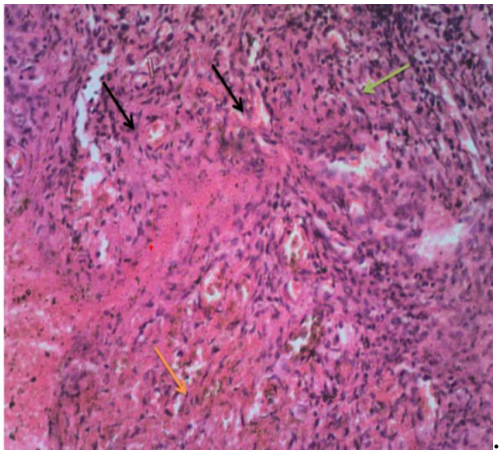

Figure 5: Histology of granulomatous tissue showing: 1. Proliferating blood vessels (black arrow), 2. Proliferating fibroblasts (orange arrow), 3. Eosinophil (green arrow)

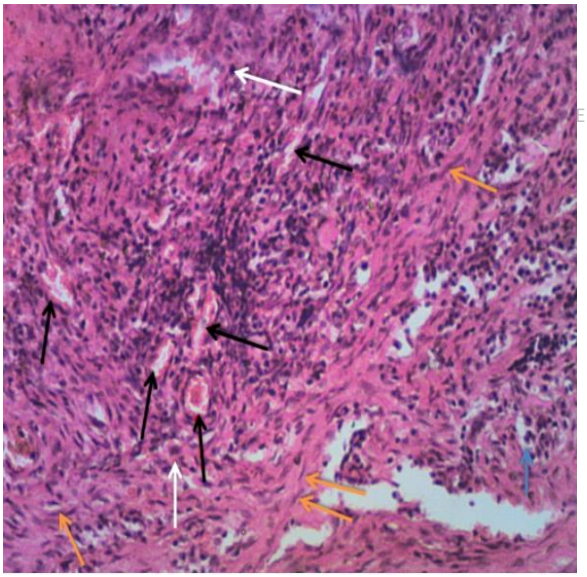

Figure 6: History of granulomatous tissue showing 1. Proliferating blood vessels (black arrow), 2. Proliferating fibroblasts (orange arrow)

Discussion:

The prevalence of laryngeal granuloma following intubation has been reported to be most common of all non-specific granuloma of the larynx [2]. Contact ulcer was first identified by Chevalier Jackson in 1928 [9]. Mechanical effect of vocal process colliding against each other resulting to superficial mucosal ulceration and granulation tissue response was suggested by Jackson and Jackson in 1935.[10]

Most vocal granuloma results from trauma to the larynx from internal injury or irritation from intubation and gastroesophageal reflux [4]. However, no study has reported vocal process granuloma resulting from an impact on the larynx from an extrinsic trauma to the anterior neck region as seen in our case.

Diagnosis of vocal granuloma can easily be made by laryngoscopy examination in the clinic due to the classical location and appearance of the granuloma, but our patient did not cooperate with clinic laryngoscopy. Computed tomography scan done was only suggestive of laryngeal stenosis. However, diagnosis was made during direct laryngoscopy under GA which was supported by the histology report.

The location of the granuloma in our study is similar to the common location of vocal cord granuloma reported in most literature: at the vocal process of the arythenoid cartilages located at the posterior part of the larynx. In this case, the growths are found on both vocal processes. Multiple granulomas of the vocal process in pediatric age group are rare but has been reported following trauma from prolonged intubation. [4,11]

There are four endoscopic grading of vocal process granuloma proposed by Farwell et al: grade 1 is a sessile, non-ulcerated granuloma limited to the vocal process, grade 2 is a pedunculated or ulcerated granuloma limited to the vocal process, grade3 is a granuloma extending past the vocal process but not crossing the midline of airway in fully abducted position, grade 4 is a granuloma extending past the vocal process and crossing the midline of airway in fully abducted position. Also has a type A when it is unilateral and type B when bilateral.[12] The grading of our patient was grade 3B as seen in the figure 3 above.

Treatment of vocal cord granuloma has been reported to begin with conservative approach: PPI, inhalational, intralesional steroid and speech therapy while surgery is considered in failure of medical treatment, airway obstruction and when diagnosis is in doubt [3,13]. Studies have shown that medical treatment with PPI inhaled steroid has been successful in gastroeosophageal reflux associated cases while intubation related cases and idiopathic causes are best treated with surgical excision followed by PPI with or without any of the other treatment modality[2,3] . Combined treatment modalities were used in our case, which include surgical excision of the mass, PPI, and systemic steroid. Our patient had surgical excision due to persistent hoarseness and worsening stridor despite conservative treatment and the unusual aetiology.

Though surgical excision has been said to be associated with higher recurrence when compared with other treatment modalities. There is however no recurrence in our case 6-month post-surgical excision.[8]

Conclusion

This case revealed the possibility of developing vocal cord granuloma following anterior neck trauma. It is therefore necessary to pay a closer attention to patients with anterior neck trauma for early treatment of associated laryngeal trauma which may prevent development of vocal cord granuloma.

Consent and Ethical Approval:

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

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