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Reinke's Edema in A 5-Year-Old Child-A Rare Entity

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1. Abstract

Reinke's edema is a benign, chronic laryngeal disorder characterized by the accumulation of fluid within the superficial lamina propria, commonly associated with smoking, vocal abuse, or laryngopharyngeal reflux. Its occurrence in the pediatric age group is exceedingly rare. We report the case of a 5-year-old male who presented with hoarseness of voice persisting for one month following an acute febrile illness. There was no history of smoking, vocal strain, or reflux. Laryngoscopy revealed bilateral edematous and floppy vocal cords consistent with Reinke's edema. The GRABS perceptual voice analysis yielded an initial score of 14. The patient was managed conservatively with intravenous dexamethasone, nebulized budesonide and racemic adrenaline, oral azithromycin, proton pump inhibitors, strict voice rest, and speech therapy. Gradual improvement was observed, with the GRABS score decreasing to 9 by day 2 and 6 by day 10, signifying marked clinical recovery. This case highlights that Reinke's edema, though typically an adult pathology, can manifest in children without classical etiological factors and that early recognition with conservative therapy can result in excellent outcomes.

2. Introduction

Reinke's edema, the entire superficial layer of the lamina propria is swelled up. It is particularly common in smokers and some people who are exposed to cigarette smoke (Passive smoking). Usually, it is bilateral and characterized by edematous changes in the superficial layer of lamina propria, leading to balloon like appearance of vocal folds. It is usually caused by chronic smoking, vocal abuse and gastroesophageal reflux disease. Patients of RE usually presents with a rough quality voice and low fundamental frequency. Reinke's edema is named after the anatomist Reinke [1], who demonstrated the morphological study of the subepithelial connective tissue of the vocal fold. RE is also called as polypoid degeneration, polypoid hypertrophy or polypoid cordites [2]. Vocal cord abuse like so in case of professional singers, teachers, hawkers or in general anyone that use the Vocal cords excessively and without proper lubrication also accounts to Vocal cordites or Rinke's Edema. Reinke's edema is not considered a pre-cancer condition, but it indicates that the vocal cords are exposed to damage from cigarette smoke [1,2]. This condition is more noticeable in women, but it can also be seen in men. Sometimes the swelling caused by Reinke's edema is so great that it can lead to shortness of breath, which at first occurs only when there is a lot of activity.

Reinke's edema treatment begins with quitting smoking. Even quitting smoking does not result in recovery in advanced situations. Even when a few weeks have gone by since the course of treatment, smoking still increases the risk of recurrence. Because of this, many otorhinolaryngology specialists would rather advise quitting smoking prior to Reinke's edema operation [3]. Micro laryngeal surgery is thought to be the primary treatment if Reinke's edema does not go away after quitting smoking. Complications from surgery for Reinke's edema can include roughness and scarring, which are extremely challenging to heal. Surgeons prioritize quitting smoking prior to any procedure due to the high risk of harm, even though the procedure increases volume and resolves any breathing issues [4].

3. Case Report

A 5-year-old male child came to the ENT OPD with chief complaints of hoarseness of voice since past 1 month post an episode of hospitalization due to Acute Febrile Illness. He had no other complaints. He wasn't a smoker, or a child with history of chronic voice abuse or previous history of intubation. His father, grandfather were nonsmokers as well as the household used LPG for cooking purposes. He had no symptoms of gastroesophageal reflux disease or LPR. His general physical examination was conducted and a pediatric review was sought for, which was

unremarkable with complete immunization status relevant to his age. A full otorhinolaryngological examination was done which showed bilateral vocal cord were edematous & floppy with some polypoidal changes.

A perceptual analysis of voice using GRABS scoring system showed overall score of 14 which, Grade: 3, Roughness: 3, Breathiness: 2, Asthenia: 3, Strain: 3 [9].

The patient was admitted in Male ENT ward of Saraswathi Institute of Medical Sciences, Hapur, U.P and was started on injectable dexamethasone 4mg thrice a day (according to weight, 1-2mg/kg body weight), nebulization with Budecort and Duolin (saline) twice a day as well as once a day Nebulization with Racemic Adrenaline (Adr with saline, 24hrly) and Syrup Azithromycin 250mg (according to body weight) once a day. Following which the patient was kept on absolute voice rest and in due follow up along with speech therapy.

As adjunct and to take care of the chances of GERD or LPR Mouth dissolvable lansoprazole was also added.

After every 2 days video laryngoscopy was done to see the effectiveness of the treatment and any changes in the status of vocal cords, which showed some effectiveness as the GRABS score changed from 14 to 9 on Day 2 of the treatment plan effectively reducing Grade, roughness, breathiness, asthenia and strain in his voice. Whereas, anatomically there was reduction in the overall edema of Bilateral vocal cords to some extent but not throughout.

However, by day 10 there was marked decrease in the GRABS score, from initial 14 to 9 to 6 and the status of vocal cords was improved with no more floppy presentation of the cords and very less edema overall.

4. Discussion

Reinke's edema (RE) is a benign vocal fold lesion frequently observed in chronic smokers, particularly women. It represents a relatively common cause of voice disorders in the middle-aged population. The condition is primarily associated with chronic heavy smoking and prolonged voice misuse or phono trauma. Contributing factors often include gastroesophageal reflux or any form of persistent laryngeal irritation. RE is rarely seen in non-smokers, suggesting that it may represent a specialized tissue response to the thermal injury caused by smoking. The swelling of the vocal cords and the lowering of the voice are warning signs that an individual has Reinke's edema. At the microscopic level, an examination of the vocal cords in patients with Reinke's edema will show lowered levels of collagen, elastin, and extracellular matrix proteins [7]. These characteristics can be used to diagnose Reinke's edema.

Smoking, gastric reflux, and hypothyroidism are all risk factors for Reinke's edema. The symptoms of Reinke's edema are considered to be chronic symptoms because they develop gradually over time and depend on how long the individual is exposed to the risk factor. In the case of smoking, as long as the individual continues the habit of smoking, the Reinke's edema will contin-

ue to progress. This is true for other risk factors as well, such as untreated gastric reflux and overuse of the voice, which is common to professions such as singers and radio announcers [8].

However, in this case none of such factors were found and the rare presentation of RE in a pediatric age of 5-year male child is a matter of concern and a sign of being alert as an otolaryngologist for proper investigation, treatment and follow up.

5. Conclusion

Although smoking remains a well-established risk factor for Reinke's edema, other contributing elements are currently under investigation to explain its occurrence in nonsmokers. Recent studies have explored the possible involvement of bacterial colonization in non-neoplastic laryngeal lesions such as Reinke's edema. In one pyrosequencing-based analysis, Streptococcus pseudopneumoniae emerged as the predominant bacterial strain in 31 out of 44 non-neoplastic lesions examined. Streptococcus species were detected in all lesions, accounting for 72.9% of the bacterial population within Reinke's edema specimens and 68.7% across all analyzed vocal fold lesions. While smoking, gastroesophageal reflux, and vocal strain remain the most widely accepted etiological factors, these findings suggest that alterations in bacterial flora may hold potential as future diagnostic indicators for Reinke's edema [10].

In our case with such rare age-related presentation, the treatment plan was started subtle rather than more aggressively like so of phono surgery or Micro laryngeal surgery (MLS). The results were tabulated analyzed.

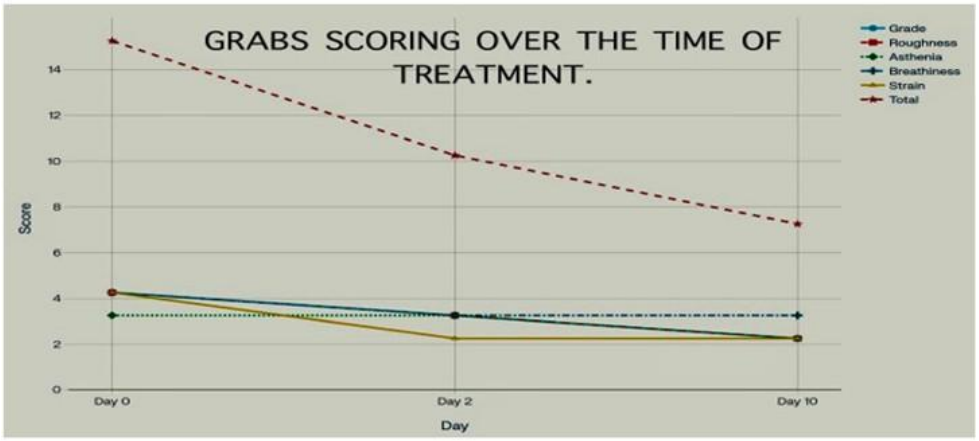

Figure 1: GRABS Scoring system over the time of treatment.

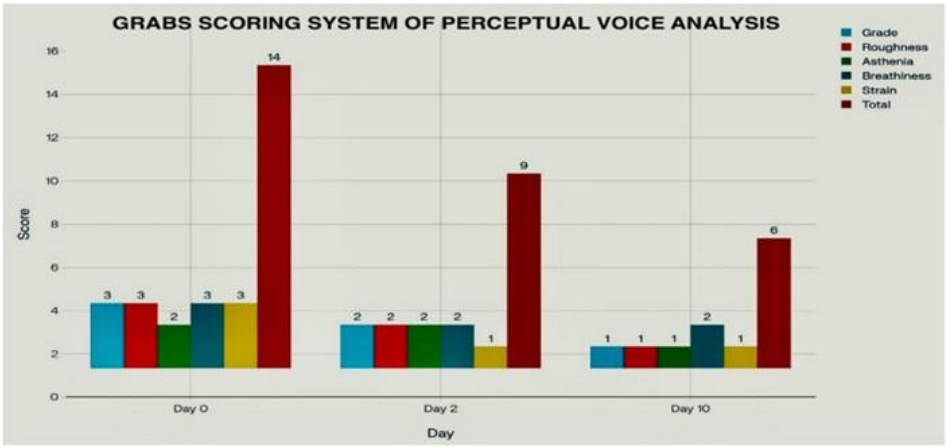

Figure 2: Bar graph showing GRABS SCORING SYSTEM.

The GRABS perceptual scoring system revealed a progressive decline in all parameters throughout the treatment period, indicating significant improvement in vocal quality. The total score decreased from 14 on Day 0 to 9 on Day 2 and further to 6 on Day 10. Individually, the grade, roughness, asthenia, breathiness, and strain components demonstrated steady downward trends, with the most pronounced recovery seen in strain and roughness. These changes reflect a reduction in vocal fold edema, improved mucosal pliability, and restoration of glottic function. The pattern suggests that early therapeutic intervention yields measurable perceptual improvement within the first few days, with continued enhancement by Day 10, highlighting both the efficacy and responsiveness of the treatment regimen.

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