Primary Atrophic Rhinitis in a Child: A Case Report and Literature Review

Abstract

Background: Atrophic rhinitis (AR) is a rare form of chronic rhinitis of unknown etiology, characterized by progressive atrophy and sclerosis of the nasal mucosa and underlying bone, leading to the formation of thick, dry crusts within abnormally widened nasal cavities.

Case presentation: We report the case of a 13-year-old child, born from a non-consanguineous marriage and without any relevant medical history, presenting with recurrent purulent rhinorrhea, repeated epistaxis, nasal obstruction, and a foul-smelling odor. Nasal endoscopy revealed dilated, dry nasal cavities with crusts on the septum and lateral walls. Computed tomography (CT) of the paranasal sinuses showed chronic pansinusitis and diffuse atrophy of the nasal and sinus mucosa. Laboratory investigations were normal. Bacteriological analysis of the rhinorrhea was sterile. The patient was treated with isotonic saline irrigations, resulting in marked clinical improvement.

Discussion: Primary atrophic rhinitis (PAR) is a rare but disabling chronic nasal disease. It results from progressive atrophy of the nasal mucosa, glands, vasculature, and even turbinate bones, leading to a wide, crusted nasal cavity and cacosmia. Several etiopathogenic hypotheses have been proposed, including infectious, nutritional, mechanical, and genetic factors. Diagnosis is mainly clinical, supported by imaging. Management remains largely symptomatic: nasal irrigation, topical vitamin A, corticosteroid sprays, or antibiotics.

Conclusion: Primary atrophic rhinitis remains prevalent in developing countries and rare in industrialized nations. It is defined by the triad of nasal cavity widening, crusting, and foul odor. The etiology remains poorly understood. Treatment is primarily medical in mild cases but may require surgical reconstruction or nasal cavity narrowing in advanced disease.

Keywords: Atrophic rhinitis; child; chronic rhinitis; cacosmia; nasal crusts; saline irrigation; pediatric rhinology

Introduction

Atrophic rhinitis (AR) is an uncommon form of chronic nasal inflammation characterized by atrophy of the nasal mucosa and turbinate bones, resulting in a wide nasal cavity filled with crusts and associated with fetor and paradoxical nasal obstruction [1, 2]. The disease can be primary (idiopathic) or secondary to infection, trauma, surgery, or irradiation [3]. Primary atrophic rhinitis (PAR) is more frequently observed in developing regions, particularly in hot and dry climates, and is thought to be related to multiple factors—infectious, nutritional, endocrine, genetic, and environmental [4, 5]. Pediatric cases are exceptionally rare, making diagnosis challenging. We report a case of primary atrophic rhinitis in a 13-

year-old child and provide a literature review emphasizing diagnostic features and management strategies.

Case Presentation

A 13-year-old boy with no significant medical history presented with recurrent purulent nasal discharge, repeated epistaxis, nasal obstruction, and a foul odor noted by his family. He was born from a non-consanguineous marriage and had no known exposure to irritants. Nasal endoscopy showed dilated nasal cavities with a dry mucosa and adherent crusts on the septum and lateral walls. CT of the paranasal sinuses revealed chronic pansinusitis and diffuse mucosal atrophy involving all paranasal sinuses. Blood tests were unremarkable, and bacteriological cultures of nasal secretions were sterile. The patient was managed conservatively with saline irrigations and nasal humidification, resulting in a marked reduction of crusting, improved nasal airflow, and resolution of the fetid odor over several weeks. Follow-up is ongoing.

Discussion

Primary atrophic rhinitis is a rare, chronic disease that predominantly affects women in tropical and subtropical climates but is exceptionally rare in children [1, 2, 5]. The hallmark is atrophy of the nasal mucosa, glands, blood vessels, and turbinate bones, leading to an abnormally large, dry nasal cavity [4]. The pathogenesis remains unclear. Infectious theories involve Klebsiella ozaenae and other opportunistic bacteria [5]; nutritional deficiency (vitamin A, iron, protein) and endocrine or autonomic dysfunction have also been suggested [1, 3, 6]. Mechanical factors such as excessive nasal airflow after surgery or trauma may contribute to mucosal desiccation [4]. Genetic predisposition has been sporadically reported.

The disease is characterized by the triad of (1) widened nasal cavities, (2) thick crust formation, and (3) fetor (cacosmia) [1, 4]. Additional symptoms include recurrent epistaxis, nasal obstruction, anosmia, and sometimes secondary infection. In children, the presentation can mimic chronic rhinosinusitis or foreign-body retention [6, 7]. Diagnosis is primarily clinical, supported by nasal endoscopy and radiological imaging. CT typically reveals turbinate atrophy, sinus involvement, and mucosal thinning [5, 6]. Cultures are often sterile, although Klebsiella ozaenae or Pseudomonas species may be isolated in some patients [5].

There is no definitive cure for primary AR. Treatment is symptomatic and supportive: nasal irrigation with saline to remove crusts and restore humidification [2]; topical lubricants or oils (liquid paraffin, glycerin drops) [1]; topical vitamin A or estrogen therapy to promote epithelial regeneration [4]; systemic antibiotics when infection is confirmed [5]; surgical approaches (e.g., Young's operation, nasal cavity narrowing using grafts or implants) reserved for refractory cases [6, 7]. Our patient improved with conservative management, supporting reports that early intervention and continuous nasal hygiene may be effective in mild pediatric presentations [6].

Conclusion

Primary atrophic rhinitis is a rare but distinctive chronic nasal condition that can also affect children. It should be considered in any child with recurrent nasal crusting, fetor, and paradoxical obstruction. Diagnosis is clinical and radiologic, and management is mainly conservative. Public health awareness and access to nasal hygiene measures can reduce morbidity, particularly in developing regions.

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