



# Rhinolith Associated with *Pseudomonas Aeruginosa* in a Diabetic Patient

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## ABSTRACT

Rhinolithiasis is a rare condition in routine otolaryngologic practice and may cause chronic sinusitis. *Pseudomonas aeruginosa* is frequently found microorganism in chronic sinusitis. Although pseudomonas infections are not uncommon in chronic sinusitis, no report of co-existence of the trinity of rhinolithiasis, nasal pseudomonas infection and diabetes mellitus was found in the literature. This paper discusses the clinical features of rhinolithiasis in a 45-year-old diabetic female who presented with rhinolithiasis and nasal pseudomonas infection.

**Key words:** Rhinolithiasis, pseudomonas aeruginosa, diabetes mellitus

## INTRODUCTION

Rhinoliths are masses in the nasal cavity usually composed of calcium carbonate, magnesium carbonate, calcium phosphate, and magnesium phosphate (1). Rhinoliths usually originate from an endogenous or exogenous nidus and grow up on this nidus. The endogenous nidus may be a blood clot, a bone fragment, epithelial debris, or an ectopic tooth. Materials such as paper, cotton wool, a piece of stone, a fruit seed, or a button may act as an exogenous nidus (1,2). Cases of rhinolithiasis are rarely seen in routine otolaryngologic practice. They usually present with unilateral nasal obstruction, unilateral nasal discharge, and epistaxis, but are sometimes diagnosed incidentally during routine physical examination. As the rhinoliths increase in size, they may give rise to foul-smelling discharge, palatal and septal perforation (1). This case study is reporting co-existence of trinity of

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## Diyabetik Bir Hastada *Pseudomonas Aeruginosa* ile İlişkili Rhinolithiasis

### ÖZET

Rhinolithiasis, günlük kulak burun boğaz uygulamalarında nadir olarak görülen bir durumdur ve kronik sinüzite sebep olabilir. *Pseudomonas aeruginosa* kronik sinüzitte sıklıkla tespit edilen bir mikroorganizmadır. *Pseudomonas* infeksiyonları kronik sinüzitte nadir olmasına rağmen literatürde rhinolithiasis, nazal pseudomonas infeksiyonu ve diabetes mellitus olan üçlüye dair herhangi bir yayına rastlayamadık. Bu yazıda rhinolithiasis ve nazal pseudomonas infeksiyonu olan 45 yaşında diyabetik bir kadın hastadaki burun taşının klinik özellikleri tartışılmaktadır.

**Anahtar kelimeler:** Rhinolithiasis, pseudomonas aeruginosa, diabetes mellitus

rhinolithiasis, nasal *Pseudomonas aeruginosa* infection, and diabetes mellitus.

## CASE

A 45-year-old female was admitted to our outpatient clinic with a one-year history of unilateral nasal obstruction, headache, and purulent discharge. Anterior rhinoscopy and nasal endoscopy revealed a yellow-gray, hard, irregularly surfaced mass in the right nasal cavity, which was painful on gentle movement, right-sided nasal septal deviation, edematous mucosal inflammation, and purulent rhinorrhea (Figure 1). There was no past diagnosis of chronic disease such as diabetes mellitus, foreign body insertion into her nasal cavity, or any surgical treatment in this region.

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Computed tomography (CT) of the paranasal sinuses was performed to determine the exact nature and extent of this huge lesion. On CT images, the material was completely radiopaque, 40x24x18 mm in size, and covered the nasal floor fully, rising up to the middle concha. It was surrounded by nasal secretions and the lower turbinate was pushed superiorly and laterally (Figure 2). Routine laboratory tests showed that the patient had diabetes mellitus.

The patient underwent an intervention under general anesthesia. A huge, yellow-gray, irregularly shaped mass that filled the entire right nasal cavity was observed via a 0° rigid nasal endoscope. The mass could not be extracted in a single piece on the first attempt, so it had to be broken to pieces with nasal forceps with the guidance of the 0° rigid nasal endoscope. All components of the mass were removed completely. In addition, a septoplasty procedure was necessary to relieve the nasal passage. Immediately after the surgical removal of the rhinolith, it was observed that surgical field was free of the mass. The specimen (Figure 3) was sent for histological and microbiological investigation. Histological investigation of the material revealed rhinolithiasis and microbiological examination revealed *Pseudomonas aeruginosa*.

The patient was referred to the Department of Infectious Diseases for her nasal *Pseudomonas aeruginosa* infection. Based on the results of antibiotic sensitivity testing, oral ciprofloxacin treatment was prescribed for three weeks. After both surgical and medical treatment, at the 1-year follow-up, the patient's symptoms had improved and nasal endoscopic examinations were normal.

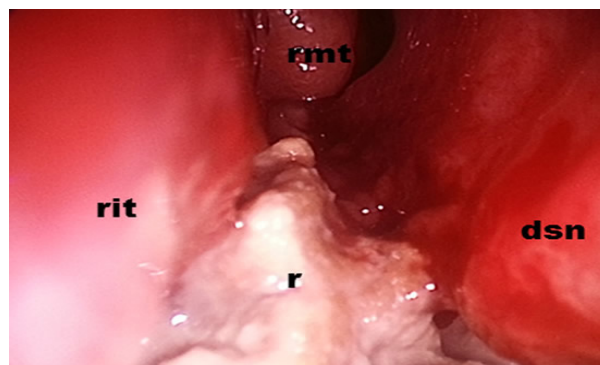
## DISCUSSION

Most patients with rhinolithiasis are admitted to a hospital with nonspecific symptoms such as unilateral purulent rhinorrhea and nasal obstruction. Rhinoliths are generally located in the nasal cavity (2-4). The detection of rhinolithiasis starts with suspicion based on the patient's nasal complaints. Nasal endoscopic examination has an important role in the diagnosis and determination of the extent of rhinolithiasis. Repeated direct x-rays might provide only limited and insufficient information about the location and dimensions of the rhinolithiasis. In some circumstances, CT is more helpful in the differential diagnosis, which includes fungus ball (5), ossifying fibroma, odontoma, osteoma, and osteosarcoma (6). Özdemir

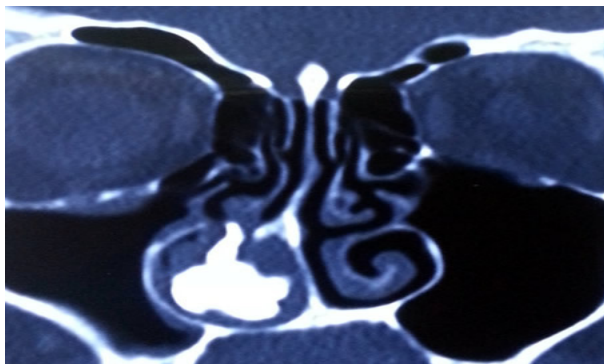
et al. (7) detected co-existence of rhinolithiasis with squamous cell carcinoma. In our patient, on CT images, the material was completely radiopaque and measured 40x24x18 mm. It fully covered the nasal floor and rose up to the middle concha, with nasal secretions around it. Significant nasal septum deviation was also observed. Minimal bony thinning of the nasal floor was present.

Rhinolithiasis might make its environment ready for some sinusitis processes. Mercado and Goldberg (8) isolated *Morganella morganii* and *Klebsiella pneumoniae* from rhinolith samples. Zalagh et al. (9) reported an actinomycotic rhinolithiasis with an ectopic tooth. Wu et al. (10) reported a case associated with aspergillosis. *Pseudomonas aeruginosa* colonization can be seen with chronic sinusitis in the nasal cavity. In a study of maxillary sinus secretion cultures, *Pseudomonas aeruginosa* was the agent most frequently found in patients with chronic sinusitis (11). In our case, microbiological analysis of the mass showed *Pseudomonas aeruginosa* infection, and an appropriate antibiotic was prescribed. The mechanism of rhinolith formation is not completely understood, but is thought to be the result of complex processes of prolonged duration. In our case, no evidence of exogenous rhinolithiasis was found despite all of the investigations performed. The lack of evidence of an exogenous cause suggests an endogenous etiology in this case.

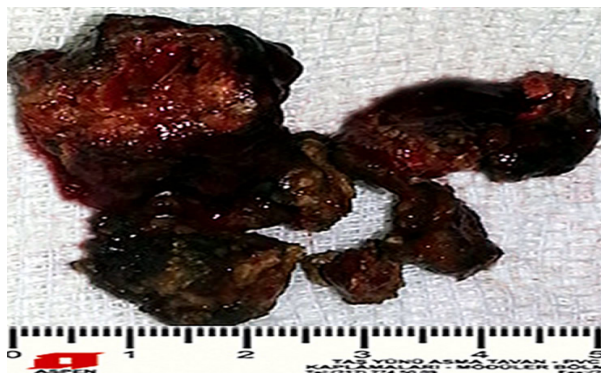
The treatment of rhinolithiasis involves removal of the



**Figure 1.** Endoscopic examination shows rhinolith and related nasal structures (*r*: Rhinolith; *dsn*: Deviated septum nasi; *rmt*: Right middle turbinate; *rit*: Right inferior turbinate).



**Figure 2.** CT of the paranasal sinuses shows in the right nasal cavity, huge rhinolith extend from floor of the nose up to the middle turbinate. Floor of the nose is thinner and right nasal cavity is larger than the left.



**Figure 3.** Specimen demonstrates the rhinolith after surgically removal by endoscopic approach.

rhinolith and the use of appropriate antibiotic therapy to control local infection when necessary. The surgical approach chosen depends on the location and size of the rhinolith, the presence or absence of complications, and the patient's age and general condition. Rigid nasal endoscopy is the most commonly used method for the diagnosis and the treatment of rhinolithiasis (12). Large rhinoliths often can be broken up by strong forceps to avoid damaging vital structures. Before removing a rhinolith, anatomic obstacles must be eliminated (i.e., nasal septum deviation). In the present case, rigid-nasal-endoscope-guided complete removal of the rhinolith was performed following the septoplasty procedure.

In conclusion, rhinoliths may have different clinical presentations, and generally, the patients are admitted for nasal symptoms such as nasal obstruction and discharge, as were present in our case. Nasal endoscopic, microbiological, histological, radiological investigations must be performed for accurate diagnosis and treatment of rhinolithiasis. Rhinolithiasis may cause chronic sinusitis processes and be in co-existence with some microorganisms (e.g., *Pseudomonas aeruginosa*).

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