

Incidence of Giant Rhinoliths- Our Experience at a Tertiary Care Centre

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ABSTRACT

Introduction: Rhinoliths are rare calcareous bodies presenting in nasal cavity. These are mostly unilateral and there is history of nasal obstruction and fetid nasal discharge. Study aimed to assess the prevalence of giant rhinoliths in a tertiary care teaching hospital and to analyse the endoscopic management of rhinolith.

Materials and Methods: In this study a total of 1,94,400 patients attending the otolaryngology out patient department in a period of five years, were analysed and screened and 43 cases of rhinoliths were diagnosed out of which 11 rhinoliths were unusually large. CT scan and nasal endoscopy play an important role in making the diagnosis of rhinolith. All the patients with rhinolith were managed endoscopically.

Result: 75% cases were females and all the rhinoliths were removed endoscopically. The benefit of endoscopic management of rhinoliths has been discussed.

Conclusion: Rhinoliths though rare should be kept as differential diagnosis in cases of unilateral nasal obstruction with foul smelling nasal discharge.

Keywords: Rhinolith; Mineralization; Endoscopic surgery; Maggots; Septal perforation

INTRODUCTION

Rhinoliths are defined as mineralized foreign bodies or stone in the nasal cavity. These are rare to occur and most of the time they are accidental finding on anterior rhinoscopy. Giant nasal stones are rare now due to improved diagnostic techniques like nasal endoscopy, microscopic rhinoscopy.¹

Rhinoliths are said to be most common in children and mentally retarded adults. They can be endogenous or exogenous in origin. Desiccated blood clots, ectopic teeth, bone fragments, inspissated mucous are example of endogenous causes and beads, cotton, seeds, rubber pieces, plastic pieces are exogenous causes.² Exogenous rhinoliths can also develop after trauma, surgical operations, dental work, left over nasal packing material or plugs of ointment. Exogenous foreign bodies are mostly introduced through the anterior nares, sometimes these may enter through posterior nares during coughing and vomiting.

It can develop spontaneously in the case of a long standing chronic polypoid sinusitis with accumulation of secretions followed by mineral deposition. Tiny particles inhaled during breathing are eliminated through the secretions of mucous and ciliary action. If the nasal mucosa is damaged, these may remain adhered and in due course of time increase in size with deposition of mineral salts and incrustations.

The common presenting features are unilateral foul smelling nasal discharge, nasal obstruction, facial pain, headache, nasal bleeding, ear discharge, anosmia, palatal and septal perforation. Aim of the study was to assess prevalence of giant rhinoliths in a tertiary care teaching hospital and to analyse the endoscopic management of rhinolith.

MATERIAL AND METHODS

This retrospective study was conducted in the Department of ENT and HNS, in a tertiary care teaching hospital in west UP. It takes into account a period of five years from December 2010 to November 2015. Out of a total of 1,94,400 patients attending ENT OPD, 43 were diagnosed as cases of Rhinolithiasis, on the basis of history, clinical examination and investigations, out of which 11 were unusually large with diameter > 2.0cms, which were classified as giant rhinoliths in our study, and 32 were small with diameter < 2.0 cms. CT scan and nasal endoscopy played an important role in making the diagnosis of rhinolith. All the patients with rhinolith were managed endoscopically.

All the patients with rhinolith presented with complaints of foul smelling nasal discharge which was gradual in onset and progressive in nature. 40 patients had complaint of nasal obstruction and 36 had one or more episodes of nasal bleeding.

STATISTICAL ANALYSIS

All the statistical analysis was done using microsoft excel 2007. Results are shown in mean and percentage.

RESULTS

In this study 43 cases of rhinolith were analysed and size of rhinolith varied from 1×1 cm to 4.5×5.0 cms. 25% were males and 75% were females (Table-1). The age range was from 3-40 years (Table-2). Duration of symptoms varied from 6 days to 2 years. Foul smelling nasal discharge was the commonest complaint present in most of the cases. Rhinoliths were identified as gritty, dirty white mass in most of the cases; in one case it presented along with maggots and was brown in color (Table-3). Most of the patients were right handed and rhinoliths were also found in the right nasal cavity in all the right handed patients, probably due to the tendency of introducing foreign body in right nostril with right hand. Out of 43 patients who presented with rhinoliths, 41 belonged to rural area and only 2 cases were from urban population. Mostly small rhinoliths were seen in pediatric age group. Large rhinoliths were common in adults.

All the rhinoliths were removed endoscopically under general or local anaesthesia. Most of the rhinoliths could be removed

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piece meal after breaking the rhinoliths; only 5 small rhinoliths could be removed as a single piece. Mineralogical investigations showed mineral whitlockite ($\text{Ca}_3(\text{PO}_4)_2$) as the main constituent in twenty six cases and carbonated apatite in rest 17 cases.

DISCUSSION

Rhinoliths are rare to be found in clinical practice with an incidence of 1 in every 10,000 otolaryngology patients.³ First published report about calcified nasal foreign bodies is by Bartholini in 1654. He described a stone hard foreign body that had grown around a cherry stone.

The most extensive study was done by Polson et al in 1943. They reviewed 495 cases in which age range was from 6 months to 86 years and there was a female predominance. Rhinoliths are said to be more common in children and young adults.⁴

In a study by Ozdemir et al (2010) comprising of 21 patients diagnosed with rhinolith, 9 were males and 12 females. Age range was between 4-63 years. Purulent rhinorrhoea, and nasal obstruction were the commonest symptoms. Other symptoms were headache, oral malodour, and recurrent epistaxis.⁵

Dogan M et al.(2012) quoted Kharoubi who reviewed 20 cases of rhinolithiasis between years 1990 to 2007. In his study 55% were adult females, out of which 66% were living in rural area and were of lower socioeconomic status. The diagnosis delayed from 6 months to eight years. In 60% of cases the unilateral rhinolith was in right side of the nose. One patient with destruction of posterior septum had bilateral rhinolith.⁶

Vink BW et al (2002) analysed a rhinolith microscopically and macroscopically and discussed about the microscopic appearance and chemical analysis of the rhinolith. They found sodium and calcium containing rings in the rhinolith.⁷

The pathogenesis of formation of rhinolith is unclear. They are formed by mineralization around an exogenous or endogenous foreign body nidus. 20% of rhinoliths are said to be endogenous in origin. According to Brehmer D. et al.(2010) four conditions are thought to play role in formation of a rhinolith –(i) the foreign body introduced into the nose must give rise to acute or chronic inflammation of the nasal mucosa with consecutive suppuration (ii) putrid discharge must have high content of calcium and/or magnesium (iii) the mechanical obstruction must block the outflow of pus and mucous (iv) the secretion must be exposed to a current of air, to concentrate pus and mucus and permit the mineral salts to precipitate, and thus give rise to incrustations. In the present study one case presented with history of maggots and parents were unaware of any foreign body in the nose. The patient had undergone cleft palate surgery, and probably one of the tooth was fractured and dislocated to nasal cavity causing rhinolith formation, infection and infestation with maggots. Foreign body was found while removing maggots from nasal cavity.

CT-scan is an important investigation for the diagnosis of rhinolith due to its sensitivity in recognizing even small amount of calcification and to ascertain the shape, size, extent and location of the mass and its relation to the surrounding tissues (figure-1). The first radiological description of rhinolith was given by MacIntyre in 1900.⁸ Radiographically they may present as homogenous or heterogeneous radiopacities of varying size and shape depending on the nature of the nidus. They may have laminations and sometimes their densities may

Size	Number of patients	Sex
> 2 cms	11 (25.5%)	F- 9 (81.8 %) M-2 (18.8%)
< 2 cms	32 (74.4%)	F- 24 (75%) M-8 (25%)

Table-1: No. of patients according to size

	< 10 yrs	10 - 19yrs	20 - 29 yrs	30 - 40 yrs
> 2 cms		3	3	5
< 2 cms	18	7	4	3

Table-2: Age distribution according to size of rhinolith

Symptoms	Number of patients
Nasal Obstruction	40 (93.0%)
Bleeding	36 (83.7%)
Foul Smelling Discharge	37 (86.0%)

Table-3: Clinical presentation of cases

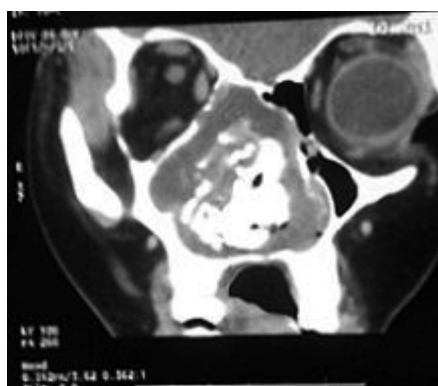


Figure-1: CT scan showing opacification of right and left nasal cavity



Figure-2: Rhinolith measuring 4.5cms and 5 cms

exceed that of the surrounding bone. The differential diagnosis includes tori, calcified nasal polyps, impacted tooth, ossifying fibroma, chondrosarcoma, tubercular calcification etc.

Rigid endoscopy has an immense role in establishing a diagnosis and removal of rhinolith. It is a cost-effective diagnostic as well as therapeutic method. The endoscopic nasal surgery provides an opportunity to manipulate and remove the entire mass under direct visual control, and at the same time is helpful in managing any complications of rhinolith.⁹ Other modalities for removal of rhinolith have been suggested by various authors depending upon the size, location and associated complications. Use of lithotripsy has been suggested to fragment the large rhinolith which cannot be removed by non invasive methods

and can be seen by the endoscope. Rhinolith present in the rear end of the nasal cavity can be pushed from the nasopharynx to oropharynx and can be delivered through the oral cavity under GA and putting a laryngeal pack. Large rhinoliths extending into the maxillary sinus sometimes need to be removed by lateral rhinotomy or Caldwell-Luc operation.

In present study the largest rhinolith removed was 4.5×5.0 cms in size (figure-2). The rhinoliths predominantly contain inorganic material like calcium phosphate, magnesium carbonate, oxalate and urates. The analysis is done by X ray diffractometry and infrared spectroscopy.¹⁰

CONCLUSION

Rhinoliths though rare should be kept as differential diagnosis in cases of unilateral nasal obstruction with foul smelling nasal discharge. A thorough history, clinical examination CT scan and nasal endoscopy (diagnostic as well as therapeutic) play a very important role in the diagnosis and treatment.

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