

Antrochoanal polyp (ACP) in a 4-year-old child: a rare case

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Abstract:

Background: Antrochoanal polyp is a benign, solitary polypoidal lesion arises from the maxillary antral mucosa that traverses through the ostium to the choana extending in a variable extent to the naso/oropharynx. It is usually unilateral. It should be on differential diagnosis of any patients with nasal obstruction and chronic nasal discharge. Nasal endoscopy, computed tomography (CT), cone beam computed tomography (CBCT) and magnetic resonance imaging (MRI) are the main diagnostic techniques. Complete endoscopic surgical removal from the antral portion is recommended to prevent recurrence. Here a 4-year-old child of antrochoanal polyp who underwent functional endoscopic sinus surgery (FESS) with complete clearance from the maxillary antrum is presented. Dutch anatomist Fredrik Ruysch in 1661, first known scientist published a description of polyps arising from the maxillary antrum.¹ Palfyn in 1753 described a two-sac polyp arising from the maxillary sinus mucosa.² In 1891, Zuckerkandl described a case of a solitary polyp originates from the maxillary sinus.³ In 1906, the term antrochoanal polyp (ACP) was first coined by Professor Gustav Killian who described it as a unilateral, solitary, and pear-shaped mass with a cystic stalk arising from the maxillary antrum, differing from the other nasal polyps in the formation of two constrictions where one when passes through the maxillary ostium in the nasal cavity and the other when it traverses from the nose through the choana towards the nasopharynx.⁴ This definition is still used, and given ACP the eponym of Killian Polyp.

Key words: Antrochoanal polyp; computed tomography (CT), FESS

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Introduction:

Antrochoanal polyps (ACP) are benign solitary lesions affecting mainly adult and young children. It arises due to hypertrophy of the mucosa of maxillary sinus and comes to nasal cavity through natural or accessory maxillary ostium and goes to posterior choana from the nose to the nasopharynx.^{5,6} These are mostly unilateral and approximately 4 - 6% of all nasal polyps in general population and about 35% of all pediatric cases of nasal polyps.^{6,7}

The etiopathogenesis of ACP remains unclear, nevertheless it is thought that it could be due to an increased pressure level within the maxillary sinus caused by obstruction of the sinus natural ostium and/or anatomical alteration at the ostiomeatal complex at middle meatus level, in a patient with a pre-existing silent antral cyst, subsequently forced to herniate outside, through the sinus fontanelle.⁸ Although, allergy immune response, chronic sinusitis, cystic fibrosis is also thrown to be responsible

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for its development.^{9,10} One study shown 24% patient had Aspirin-sensitive asthma triad.¹¹ Chen and his colleagues found 50% of the patients in their series had association with allergic diatheses.^{10,12} The patients of ACP mainly present with nasal obstruction but nasal discharge, snoring, headache, ear block and rarely epistaxis may be the associated symptoms.¹³ Nasal endoscopy, computed tomography, cone beam computed tomography and magnetic resonance are the main diagnostic techniques.^{8,14} Endoscopic complete surgical removal is the treatment of choice and that can prevent recurrence as well.¹⁵ Previously treated by Caldwell-Luc operation to remove the antral part and nasal part was removed by pulling or grasping by different instruments. To minimize recurrence, complete removal is mandatory. Radical surgery (Caldwell-Luc operation) of the maxillary sinus for ACP has been replaced by Functional Endoscopic Sinus Surgery (FESS).¹³ ACP is rare in pediatric age group. Throughout the literature we found in 'Google search', 6 years child was the youngest child who was diagnosed and operated.¹⁵ Here we present a case of 4-year child who underwent FESS under general anesthesia.

Case summary:

A 4-year boy was brought to us with left sided nasal obstruction, chronic nasal discharge, mouth breathing and snoring, disturbed sleep, insufficient weight gain. He is non asthmatic. He had no positive family history and no known drug sensitivity. On local examination, there was no external nasal deformity. He had muco-purulent discharge on both nasal cavities. Anterior rhinoscopy showed a pale polypoidal lesion at the mid part of left nasal cavity, coming from lateral nasal wall. Left nasal airway was completely obstructed. Further examination to assess its attachment and sensitivity was difficult to perform, as the child was irritable. On intraoral examination the same lesion was seen in the nasopharynx hanging from choana. There was poor dental hygiene with multiple carious teeth.



Fig: a) Picture showing mucopurulent nasal discharge, **b)** Showing nasopharyngeal component
On general examination his body weight was below average, lean and thin. On other systemic examination there was nothing significant. On Computed tomography scan there was an isodense lesion in the left maxillary antrum and left nasal cavity hanging through the choana into oro-pharynx. No bony erosion was evident. Right antrum and nasal cavity were found normal. Adenoid was also enlarged. Radiologically it was suggestive of left antrochoanal polyp.

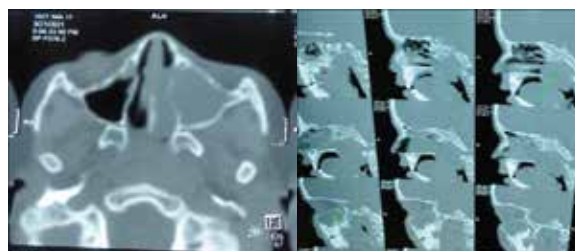


Fig: Large green arrow indicating lesion at nasopharynx, small green arrow indicating opacity in ipsilateral maxillary antrum. He underwent functional endoscopic sinus surgery under general anesthesia. Nasal cavity was prepared with repeated cut pieces of merocel soaked with topical preparation of 1:5000 adrenaline xylocaine solutions. Karl Storz High definition (HD) camera and 4 mm telescope were used during surgery. The polyp was seen to coming out from the maxillary antrum through the natural ostium. There was an accessory ostium was present posterior to

the natural ostium. After removal of vertical and horizontal portion of uncinate process the antral attachment made free. There was retained secretion within the antrum. The pedunculated portion removed per-orally. Other sinuses were not examined as these were free of disease according to CT. Ipsilateral nasal cavity was packed with small piece of Merocele nasal pack. Histopathology confirmed our clinical diagnosis as ACP.

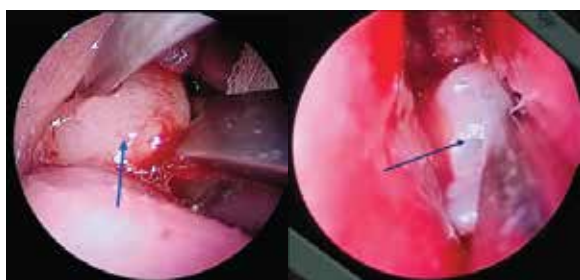


Fig: Per-oral removal of polyp

Fig: Nasal component of ACP

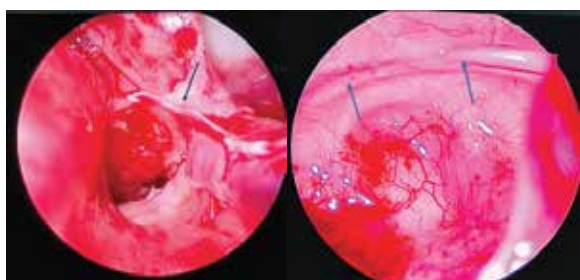


Fig: Uncinate process after breaking

Fig: Infraorbital nerve and vessels

Discussion:

Antrochoanal polyps (ACP) are rare lesion in pediatric age group and most commonly affecting the young adult and adults.^{6,7} In the pediatric age group ACP is recorded above 10 years of age that is found in most of the published literature.⁷ One 6-year-old boy presented with ACP which is considered as the youngest patient reported as per “Google Search”.¹⁵ In our case we think this 4-year-old child diagnosed ACP is the youngest one (confirmed histopathologically). Antrochoanal polyp most commonly originates within maxillary antrum that comes out of the maxillary sinus to the nasal cavity through the

natural or accessory ostium and then goes to the choana along the floor of nose towards the naso/oropharynx.¹⁶ Very occasionally it comes to anterior nares. Increased pressure level within the maxillary sinus caused by obstruction of the sinus natural ostium and/or anatomical alteration at the ostiomeatal complex at middle meatus level could be the predisposing factor for the development of ACP.⁸ Chronic sinusitis, cystic fibrosis, allergic immune response is also considered to be the etiology behind its origin.⁹⁻¹² The presented case reported with nasal obstruction and nasal discharge. Osteomeatal complex is not a wide space in the nasal cavity. It can be obstructed due to any chronic inflammatory condition of the maxillary sinus or ethmoid sinus; and that can be augmented by anatomical variation on that region or middle meatal level thus compromising the ostium.⁸ Due to increase pressure within the antrum air transport to and from the antrum during breathing is usually impaired. Developing intramaxillary force due to normal mucociliary movement, the growing ACP passes through the natural ostium and/or posterior frontanelle.¹¹ This process is in turn further enhanced by pressure gradient between middle meatus and antrum.^{11,12} The most common symptom is unilateral nasal obstruction; others are chronic nasal discharge, snoring and sleep apnea, epistaxis etc.¹³ Though epistaxis is rare in ACP but if present, Angiofibroma (especially in male children), rhabdomyosarcomas should be excluded.¹⁶ As the anatomy and extent of development of sinuses is different in children than in adult, variations in technique are frequently required. Due to the smaller intranasal anatomy of children, the surgical sites become more vulnerable to trauma. That's why surgeon performing pediatric FESS should have a proper knowledge about sinonasal anatomy. Patients CT scan should be personally reviewed by the surgeon himself during and before the operative procedure. That helps to make a preconceived surgical plan to avoid any unwanted preoperative

surprise, minimize the trauma and postoperative morbidity.^{14,15} CT was done and studied in this case very meticulously. Complete endoscopic surgical removal from the maxillary sinus is mandatory to prevent recurrence.^{14,15} Previously ACP was used to treat by Caldwell-Luc operation. But after development of nasoendoscope, the procedure has been replaced by FESS (Functional Endoscopic Sinus Surgery). Nowadays after the development of powered Microdebrider, precise excision of ACP is carried out without jeopardizing the normal mucosa of maxillary sinus that to establishing existing the mucociliary activity.¹⁶ As a result, the recurrence rate and the functional activity are relatively low in expert hand. The ACP of presented 4-year-old child was operated by Karl Storz HD camera and 4 mm telescope (0 and 70 degree); and with Medtronic microdebrider. The excised tissue was sent for histopathological examination that also confirmed the diagnosis of ACP. An adequate preoperative preparation is necessary before performing surgery. Antibiotic, antihistamine and montelukast are given preoperatively to minimize bacterial colonization as well as inflammation, so that per-operative bleeding will be less.^{12,17} Postoperatively nasal packing is a big issue in case of children as they usually do not allow to keep in the nasal cavity. In our case anterior nasal packing was done in the ipsilateral nasal cavity with a slice of Merocele. It was removed after 12 hours. The child accepted Merocele packing as he was used to be with nasal obstruction preoperatively for a prolonged period of time. It is difficult to follow up these patients for any recurrence as these small children does not allow nasoendoscopic examination in the outpatient department. A follow up CT scan is essential to see any recurrence but in this CT was not done as this article is written within a month of surgery.

Conclusion:

Antrochoanal polyp should be considered as a differential diagnosis in any child with nasal mass or nasal obstruction. Thorough clinical and radiological evaluation is mandatory for further management. Preoperative reading of CT scan by the surgeon himself is important to avoid any unwanted complication.

Disclosure:

The authors have no funding, financial relationships or conflict of interest to disclose.

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