How to Cite:
Yudha, Y. T. K., & Kristyono, I. (2022). Endoscopic medial maxillectomy for antrochoanal polyp. *International Journal of Health Sciences*, *6*(S9), 883–892.
https://doi.org/10.53730/ijhs.v6nS9.12577

Endoscopic medial maxillectomy for antrochoanal polyp

Yudhistira Thriesnarsandhi Kartika Yudha
Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Medical Center, Surabaya, Indonesia

Irwan Kristyono
Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Medical Center, Surabaya, Indonesia
Corresponding authors email: irwan-kristyono@fk.unair.ac.id

***Abstract*---**Antrochoanal polyp (ACP) are benign lesions that originate from the mucosa of the maxillary sinus, and extend into the nasal cavity to reach the choana and nasopharynx. The treatment of ACP is surgical, endoscopic medial maxillectomy (EMM) is one of the options for surgical therapy. ACP generally affects adolescents but in this case by adults. To report and analyze ACP in adult patient with EMM technique. A 45-year-old man with an ACP completely removed by EMM technique. The evidence-based literature regarding the ACP, their management, and its complications were conducted on the Pubmed Medline, PMC and Google Scholar database. Based on the inclusion and exclusion criteria, two studies were found relevant to our case. From sources in two journals, both are retrospective studies with the ACP completely removed with endoscopic medial maxillectomy technique and the other is a retrospective descriptive study. Complete ACP removal with the EMM technique. There was no complications during and after surgery and we had no recurrences during the control period.

***Keywords*---**antrochoanal polyp, endoscopic, medial maxillectomy.

Introduction

Antrochoanal polyp (ACP) is a benign tumor originating from the mucosa of the maxillary sinus, prolapsing into the nasal cavity through the maxillary sinus ostium and is sometimes found in the koana and nasopharynx. Professor Gustav Killian in 1906 first explained the diagnosis and therefore up until now the antrochoanal polyp is also called the Killian polyp.[1] The etiology of the ACP remains unclear. Allergic disease is disease with complex genetic.[2] Chronic fibrotic and cystic sinusitis are involved in the etiology. Some cases were reported to develop as a complication of allergy and 24% of patients with antrochoanal polyps had the aspirin sensitive triad astma.[5] Various mechanisms have been proposed to explain the development of the ACP, but their causes remain largely unknown and considered a major topic of debate. One study found a statistically significant association between allergy and antrochoanal polyp. Another theory found that in 200 reviews of cases of antrochoanal polyps, significant risk factors were found, namely anatomical abnormalities such as septal deviation, inferior turbinate hypertrophy and concha bullosa.[3,5]

Antrochoanal polyps are common in children and young adults with the main symptom of a one-sided (unilateral) stuffy nose. Other symptoms can include rhinorrhea, snoring and dysphagia. Its solid, unilateral, bluish and sometimes yellowish character can be found on physical examination of the anterior rhinoscopy.[3,4] The antrochoanal polyp seen on nasoendoscopy examination appears as a smooth, yellowish or bluish-white mass in the nasal cavity extending posteriorly to the koana and nasopharynx, with stalks extending from the middle meatus.[1] Computerized tomography scan (CT-scan) is the gold standard for diagnosing antrochoanal polyp, in which a hypodense mass is enlarged and emerges from the maxillary sinus. The antrochoanal polyp does not cause bone destruction but when enlarged it can dilate the maxillary sinus ostium.[5]

Management of the antrochoanal polyp is primarily a surgery. Endoscopic sinus surgery technique has become a widely accepted modality and conventional surgical procedures have been replaced by endoscopic sinus surgery. Some examples of conventional surgical techniques include simple polypectomy, the Caldwell-Luc procedure and the inferior meatal nasoantral window with anterior inferior turbinate resection.[6] The purpose of writing this case report is to report a case of an antrochoanal polyp that underwent therapy with endoscopic medial maxillectomy.

Case

A male patient, Mr. H, 45 years old, living in Jombang, working as an entrepreneur, came for treatment at the ENT-Head and Neck Outpatient Unit Dr. Soetomo General Hospital Surabaya on September 11st, 2019. The patient was referred from Jombang Regional Hospital with a diagnosis of left nasal cavity polyp. The medical history indicated that the main complaint was left nose obstruction since 2 years before admission to the hospital. The main complaint of the patient is a left nose congestion since 2 years ago, this complaint is felt continuously and has gotten worse since 6 months. The nasal mucus on the left was clear and sometimes mixed with blood. There were also left cheek pain,

smelling sense disorder and post nasal drip. There were no pain in the face, forehead, crown of the head and back of the head. The patient admitted that the left eye continued to water.

There was a history of dust allergy, asthma, active smoking, and hypertension. Physical examination showed no facial deformities of the patient (Figure 1). Anterior rhinoscopy showed a mass filled the left nasal cavity. A smooth whitish mass did not appear to bleed easily. The inferior turbinate was difficult to evaluate. A clear transparent secretion was obtained. There was a pressure towards the contralateral nasal cavity (Figure 2). No abnormalities were found in the examination of ear, throat, head and neck. The patient was not subjected to a nasoendoscopy, but mass biopsy was immediately performed on the left nasal cavity with "inflammatory polyp" results.

Figure 1. Patient's face before surgery, no deformities on the patient's face.

Figure 2. Anterior rhinoscopy examination on the left nasal cavity.

CT scan of the paranasal sinuses without contra[3]ith sagittal, coronal and axial sections was performed at RSUD Dr. Soetomo S[3]aya. The results showed that the connective tissue (20-57 HU) filled and caused bulging of the left maxillary sinus, the lesion appeared to digest part of the medial wall of the left maxillary sinus, filled the left nasal cavity, caused deviation of the nasal septum to the right, eroded the posterior wall of the maxillary sinus accompanied by details of expansion, and it still did not eliminate the malignant mass (Figure 3).

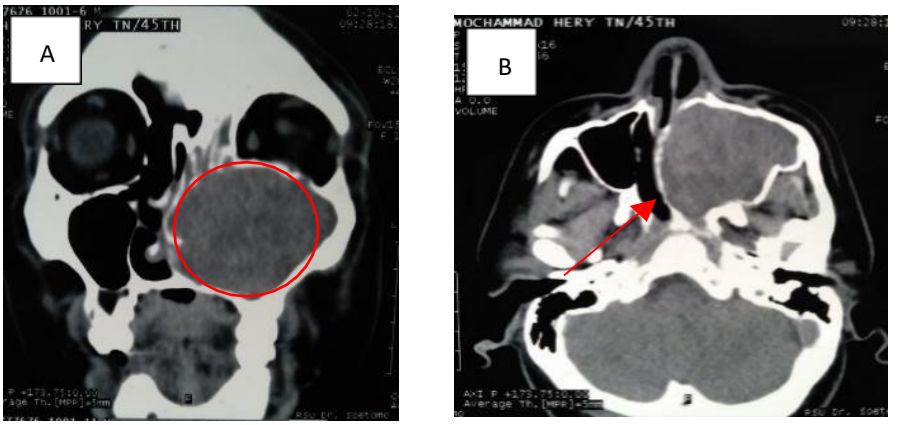

Figure 3. (A). CT-san section of the coronal plane showing a mass in the left maxillary sinus (red circle), (B) The axial section showing a visible mass pressing the nasal cavity on the contralateral side (red arrow).

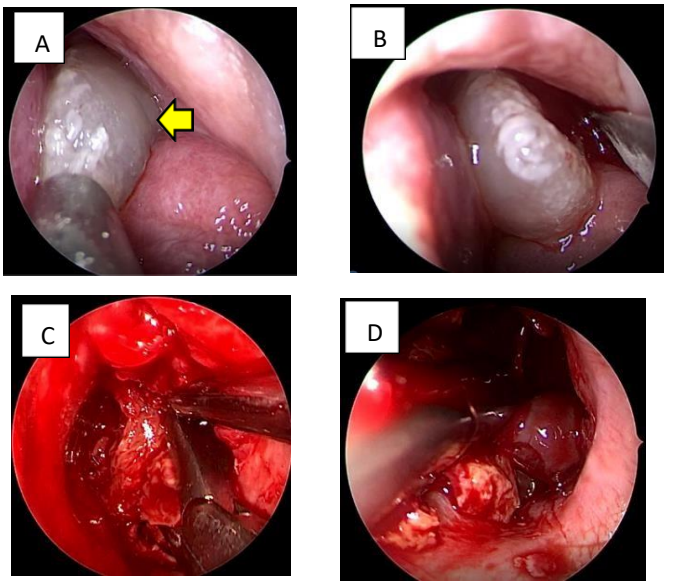

Figure 4. Left nasal cavity (A) whitish mass, smooth, does not appear to bleed easily (yellow arrow), (B) lateral mucosal incision of the nasal cavity, (C) Splitting of the medial wall of the maxillary sinus, (D) Cleansing of the mass by using Blakesley and the anterior maxillary sinus polyp mass using Heuwiser antrum forceps

The patient underwent an endoscopic medial maxillectomy in January 2020 under general anesthesia. Patients were given the premedication drug Cefazolin 2 grams dissolved in 100 cc of 0.9% NaCl just before intubation. Patients were positioned reserve trendelenburg 20°, then the operating field was disinfected with 70% alcohol. The mass in the sinistra nasal cavity identified. The lateral mucosal incision of the nasal cavity was performed with mess No. 15. The mucosa

was gently prepared until the medial wall of the maxillary sinus was obtained, followed by retaining the medial wall of the maxillary sinus and removing the rest of the bone. After the mass was identified, the entire mass was removed until it was clean slowly and the bleeding was controlled (Figure 4). The nasal cavity and the sinistra maxillary sinus have become one room. The anterior maxillary sinus antrum was cleaned using the Heuwiser antrum forceps. Bleeding was controlled with 0.9% NaCl irrigation, cauter and tampon kemicetin insertion. After the surgery was completed, the tissue samples were examined for postoperative histopathology (Figure 5).

After surgery, the patient was treated for five days in the Teratai ward. The therapy given in the inpatient room was Cefadroxil capsules 2x500 mg orally and Metamizole injection 3x1 gram intravenously on the first postoperative day. On the second day of postoperative treatment, the kemicetine tampon in the sinister nasal cavity was loosened slowly while evaluating for active bleeding after the loosening. Analgesic therapy was changed to Paracetamol tablets 3x500 mg orally.

Figure 5. Mass of postoperative antrochoanal polyp

The antibiotic therapy was the same as the previous day. On the fifth day of postoperative treatment, all kemicetin tampons were taken and the evaluation showed no active bleeding in the sinister nasal cavity. The patient had no complain of nasal congestion, runny nose and his smelling sense became better. The patient was discharged from the hospital and given nasal washing therapy with Nacl 0.9% twice a day at home. The first follow up visit was planned on the seventh day postoperative.

The patient underwent two follow up visits at intervals of one week. The first visit was on the seventh day after surgery. There were no complaints of nasal congestion, active bleeding, runny nose, smelling disorders, cheek pain, facial pain and watery eyes. Nasoendoscopy revealed the mucosal antrum edema, and the crusts were then cleaned (Figure 5a). The patient received nasal washing therapy with Nacl 0.9% twice a day. One week later, during the second follow up, there were no complaints of nasal congestion, runny nose, smelling disorders, cheek pain and watery eyes. Nasoendoscopy revealed crusts on the nasal cavity mucosa which were then cleaned (Figure 5b). Patients also submitted

postoperative biposy results showing ”inflammatory polyps with extensive necrosis”. Two weeks apart, during the third follow up, there were no complaints of nasal congestion, runny nose, smelling disorders or cheek pain. Nasoendoscopy revealed minimal crusts in nasal mucosa, which were then cleaned. The examination also obtained a cyst formation in the left maxillary antrum on the lateral side (Figure 5c). The patient received the same therapy, i.e. nasal washing therapy with 0.9% Nacl. The patient planned a subsequent follow up two weeks apart from the third visit. In the fourth follow up, the patient had no complaints about nasal congestion, runny nose, smelling disorders or cheek pain. Nasoendoscopy revealed

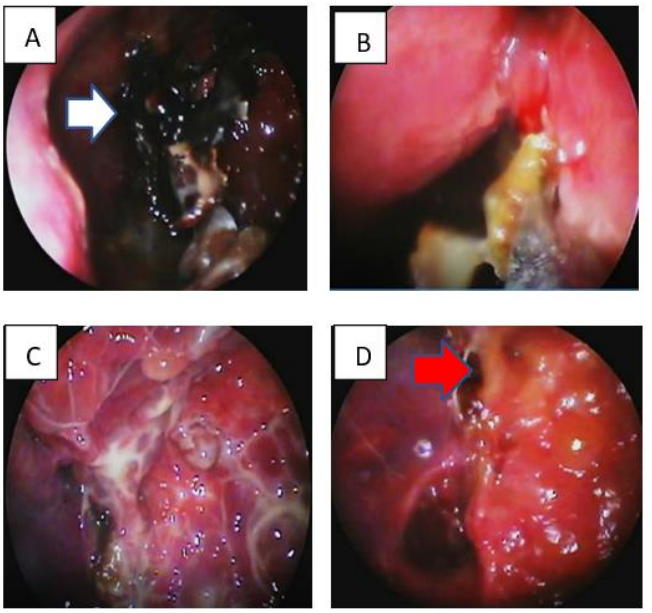

Figure 5. Left nasal cavity (A) Removal of crusts and blood clots in the left nasal cavity (white arrow), (B) and (C) minimal blood clot, minimal mucosal edema & formation of crusts, (D) Fibrosis and granulation tissue appeared, minimal crust & cyst formation on the left maxillary antrum (red arrow)

minimal crusts in nasal cavity mucosa, which were then cleaned, and minimal cyst formation (Figure 5d). The patient received nasal washing therapy with Nacl 0.9% and the patient can undergo the follow up at Jombang General Hospital. The patient was advised to come back to Dr. Soetomo General Hospital should there be any complaints after surgery.

Method

Literature search was conducted on September 29th, 2020 through Pubmed Medline, PMC and Google Scholar using the keywords "antrochonal polyp" AND "endoscopic" AND "medial maxillectomy". The literature search was carried out using the following inclusion criteria: 1) Adult patients with a diagnosis of ACP, 2) endoscopy performed with medial maxillectomy, 3) Written in English, 4) Full text

available, 5) Written in the last 10 years. The exclusion criteria were: 1) Pediatric patient, 2) Malignant mass paranasal tumor, 3) Review article (Figure 6).

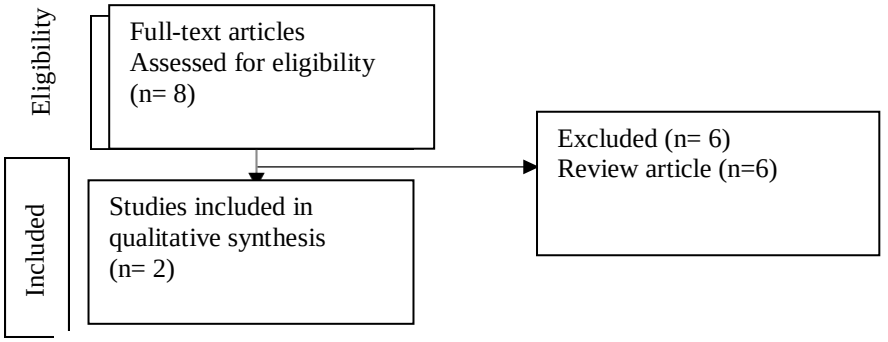

Figure 6. The flow of literature

RESULT

Table 1. Publication obtained for Critical Appraisal

	Writer Journal	Publication Type	Population / Patient	Intervention/ Index/ Indicator	Comparator	Outcome
1.	Choudury N, *et al*. Eur Arch Otorhino. 2014	Retrospective study	29 patient with antrochoanal polyps	Endoscopy medial maxillectomy	None	Complete ACP resection
2.	Shuaibu IY, *et al*. Niger med J. 2020	Retrospective study	49 patients with antrochoanal polyps	Endoscopy medial maxillectomy	None	Complete ACP resection

Discussion

Antrochoanal polyps, also known as Killian polyps, are non-atopic, benign lesions that originate in the maxillary sinus, pass through the maxillary sinus ostium (can be either ostium naturale or accessory ostium) and extend to the choanae. Stammberger suggests that 70% of cases of antrochoanal polyps pass through the accessory ostium. The diagnosis of antrochoanal polyps is based on history interview, physical examination, supporting examinations including nasoendoscopy and computerized tomography scan (CT-scan) paranasal of axial and coronal sections which are the gold standard for diagnosis.[1,2]

Antrochoanal polyps are more common in men than women, and are more common in children and young adults. In a study in India in 2016 involving 50 patients with antrochoanal polyps, reported that the peak incidence of antrochoanal polyps was in the age group of 11-20 years old amounted to 20 patients (40%), followed by the age group of 21-30 years old with 18 patients

(36%), and only 3 patients were in the age group of 41 - 50 years old (6%).[7] The patient in this case was 45 years old and a male, which corresponds to the statement that the majority of patients with this condition is male. Allergic disease is a pathologic condition.[7] Patients with antrochoanal polyps come with a nasal congestion which is usually unilateral, anterior and/or posterior rhinorrhea, headache, hyposmia or anosmia, epistaxis and facial pain. Other complaints include snoring, obstructive sleep apnea, rhinophonia and dysphagia.[3,5]

The main complaint of the patient is a left nose congestion since 2 years ago, this complaint is felt continuously and has gotten worse since 6 months. Nasal mucus was clear and sometimes mixed with blood. There were also left cheek pain, smelling disorders, post nasal drip, but there was no facial pain, forehead, top of the head and back of the head. The patient also complained that the left eye was often watery. Smell impairment, snoring and mouth breathing accompanied the main symptom.[8]

On physical examination, there was no deformity on the patient's face due to large polyp pressure from the sinuses. This does not corresponds with the description of Woakes Syndrome that in this syndrome there is erosion of the sinus walls which causes facial defects.[6] Anterior rhinoscopy of the antrochoanal polyp showed a solid unilateral mass, that is bluish, sometimes yellowish, with the impression of not easily bleeding.[4,5] The anterior rhinoscopy in this case showed a polypoid, unilateral, whitish mass that was smooth with the impression of not easily bleeding. This mass filled the left cavity and caused obstruction. Nasoendoscopic examination results of patients with antrochoanal polyps show a mass in the nasal cavity that is grayish- white, smooth with flat edges. Palpation examination with a nasoendoscopic scope show a mass that looks solid and tends not to bleed easily when touched.[5] Patients in this case did not undergo preoperative nasoendoscopy and a mass biopsy of the left nasal cavity was immediately performed. The biopsy was performed a vue. After one week the biopsy results was obtained, showing inflammatory polyps. This result of physical examinaton for this case corresponds with the theory on the diagnosis of the antrochoanal polyp.

The investigation considered the diagnostic gold standard for antrochoanal polyp is CT-scan of the paranasal sinuses. The coronal and axial sections on CT-scan will show an image of the soft tissue mass that fills the maxillary sinus and extends through the maxillary ostium to the nasal cavity between the media and the lateral nasal cavity walls without erosion or expansion of the bone that can extend to the choana and nasopharynx.[5] The patients in this case obtained a CT-scan of the paranasal sinuses without contrast with visible conjunctions (20-57 HU) which filled and bulged the left maxillary sinus, the lesions appeared to destroy part of the medial wall of the left maxillary sinus, filled the left nasal cavity, causing deviation of the nasal septum to the right, eroding the posterior wall of the maxillary sinus. This is consistent with the description of antrochoanal polyp.

Based on the history interview, physical examination, pre- and postoperative supporting and histopathology examination, The patient was diagnosed with

antrochoanal polyp. Management of the antrochoanal polyp is primarily a surgery by removing the polyp mass completely and cleanly. There are several surgical treatment options such as the simple polypectomy technique, the Caldwell-Luc procedure and the endoscopic sinus surgery approach. The simple polypectomy technique in several studies has shown a high recurrence rate. Caldwell- Luc surgery has been in practice for nearly 100 years. The Caldwell-Luc approach offers good visualization and ensures removal of the polyp and antrum mucosa. However, the Caldwell-Luc operation has side effects of cheek paraesthesia, cheek swelling and a risk to tooth development in children.[6-9]

In this case, the patient underwent an endoscopic medial maxillectomy. The treatment was chosen because the mass of the antrochoanal polyp was large, wide and the site of origin was suspectedly in the anterior region of the maxillary sinus. This measure aimed to minimize postoperative recurrences because it can reach and clear the site of origin of the polyp. Nasal polyp are benign chronic inflammatory masses.[9] Complications that arise during the endoscopic medial maxillectomy may vary, such as visual impairment due to direct injury to the optic nerve, perforation of the septal wall, cerebrospinal fluid leakage, and the formation of mucocele, crusts and synechiae.[10-12] There was no postoperative complications found in this case. There was condition improvement from the complaints of nasal blocked, clear nasal mucus, feeling of mucus falling in the throat and sharp smells.

Recurrence in this procedure can occur if the intra-antrum resection of the polyp mass leaves a residue. However, for this patient, cleaning up to the site of polyp origin, i.e. the anterior area of the maxillary sinus, has been carried out during the surgery. A journal stated there was a higher significance of recurrence in children and suggested that patients should be followed up at least two years after surgery to detect any recurrence.[12-14] Postoperative follow-up is highly necessary to determine recurrences quickly, enabling immediate mass resection. In the cases of antrochoanal polyps treated with endoscopic medial maxillectomy, the results were quite good and without complications. Patients are still advised to follow up periodically to assess the presence or absence of polyp mass recurrence. and patient got the rinsed the nose with normal saline.[19]

In conclusion, this case reported an antrochoanal polyps managed with endoscopic medial maxillectomy technique. There was no complications during or after surgery and no recurrence until 2 months postoperatively.

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