

ORIGINAL ARTICLE

The Role of Powered Instrumentation in the Removal of Antrochoanal Polyps: A 10-Year Review

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ABSTRAK

Polip antrokoanal merupakan ketumbuhan benigna yang jarang berlaku. Kami melaporkan 40 kes polip antrokoanal yang dirawat di Pusat Perubatan UKM selama sepuluh tahun diantara Mei 1998 hingga April 2008. Median umur pesakit yang terlibat adalah 37 tahun. Simptom klinikal yang sering menjadi masalah utama adalah hidung tersumbat (92.5%), diikuti oleh hidung berair (45%), lelehan belakang hidung (35%) dan berdengkur (22.5%). Median tempoh rawatan susulan adalah 30 bulan. Pelbagai pendekatan pembedahan telah digunakan; pembedahan yang paling kerap dilakukan adalah polipektomi endoskopi dengan peralatan berkuasa elektrik dan antrostomi meatus tengah pada 28 pesakit (70%), diikuti oleh polipektomi endoskopi dan antrostomi meatus tengah pada tujuh pesakit (17.5%) dengan peralatan konvensional. Lima pesakit (12.5%) menjalani polipektomi endoskopi dengan peralatan berkuasa elektrik tanpa antrostomi meatus tengah. Selain itu, dua pesakit menjalani septoplasti dan seorang pesakit menjalani sinustomi frontal. Terdapat enam pesakit (15%) menjalani pembedahan kombinasi antrostomi sublabial. Tiada komplikasi besar berlaku; empat pesakit mengalami penyakit berulang; tiga pesakit menjalani pembedahan di tempat lain dan seorang daripadanya mengalami penyakit berulang selepas pembedahan pertama. Median tempoh penempatan di dalam wad adalah tiga hari. Kami merumuskan bahawa penggunaan peralatan berkuasa elektrik dalam rawatan antrokoanal polip adalah selamat, efektif dengan morbiditi yang minima.

Kata kunci: polip antrokoanal, peralatan berkuasa elektrik, polipektomi endoskopi, antrostomi meatus tengah, antroskopi transkanin

ABSTRACT

Antrochoanal polyps are rare lesions. We report a series of 40 consecutive cases of antrochoanal polyps treated in our tertiary centre over a period of ten years between May 1998 and April 2008. The median age of the patients was 37 years. The most common clinical symptom was nasal obstruction (92.5%) followed by rhinorrhoea (45%), postnasal drip (35%) and snoring (22.5%). The median period of follow-up of these patients was 30 months. Various surgical approaches were used; the commonest was powered endoscopic polypectomy and middle meatal antrostomy

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in 28 patients (70%), followed by endoscopic polypectomy and middle meatal antrostomy in seven patients (17.5%). Five patients (12.5%) underwent powered endoscopic polypectomy without middle meatal antrostomy. In addition, two patients had septoplasty and one had a frontal sinustomy. There were six patients (15%) who had combined sublabial antrostomy. No major complications occurred; four patients relapsed; three patients had initial operation performed elsewhere and one patient developed recurrence after the first surgery. The median hospitalization period was three days. We conclude that, the use of powered instrumentation in the removal of antrochoanal polyps is safe, effective and associated with minimal morbidity.

Key words: antrochoanal polyps, powered instrumentation, endoscopic polypectomy, middle meatal antrostomy, transcanine antroscopy

INTRODUCTION

Antrochoanal polyp (ACP) is a maxillary sinus polyp with the pedicle attached to the inner wall of the maxillary sinus, emerging from the natural (or the accessory) ostium, extending to the choanae and the nasopharynx through the nasal cavity. About 4% to 6% of all nasal polyps are ACPs, which are more common in males than in females (Basu et al. 2001; Basak et al. 1998). ACPs are macroscopically identical to typical polyps, but are not associated with an allergic aetiology. Patients usually present with unilateral or bilateral nasal obstruction. In the paediatric population, sleep disturbances and mouth breathing are common. In adults, snoring and headache may be the presenting symptom.

The history of ACP recognition dates back to the 18th century. Once, it was believed that the large polyps in the posterior choana and nasopharynx originate either from the lateral wall of the nasopharynx or from the posterior aspect of the vomer. In 1906, Killian was the first to address the true site of origin and to point out the close relation between ACP and the maxillary sinus. He was also the first to recognize the enlarged antral

ostium (being 1.7cm to 2cm in diameter) in his report of 21 patients with ACP. He initially advocated snare avulsion as the mode of treatment.

Various surgical techniques were subsequently proposed as alternative effective procedures, because simple avulsion of the polyp had a high risk of recurrence. To minimize postsurgical recurrence, it is essential to completely remove the antral portion of ACP, together with the base of its origin.

The use of powered instrumentation during endoscopic sinus surgery has recently been described as an effective technique for removing ACPs from the nasal cavity and for complete removal of the antral portion (Hong et al. 2001; Yanagisawa et al. 2001; Gendeh et al. 2004). Endoscopic middle meatal antrostomy using 30, 70 and 120 degree nasal endoscopes combined with transcanine microdebridement further enhances complete removal of the antral portion of the ACP (Gendeh et al. 2004; El-Guindy & Mansour 1994).

Forty patients with ACP who were treated in our hospital over a period of ten years were reviewed to observe the clinical presentation, associated rhinological findings and the surgical mode of treatment for ACPs.

MATERIALS AND METHODS

We retrospectively reviewed the clinical presentations and operative records of patients with ACPs treated surgically over a period of ten years between May 1998 and April 2008 at the Department of Otorhinolaryngology, Universiti Kebangsaan Malaysia, Kuala Lumpur. Clinical symptoms, associated rhinological findings and the surgical procedure were reviewed.

Consent was taken after explaining the full nature of the surgery and the risks involved. After administration of general anesthesia, all patients were given local infiltration prior to the surgery. The main author (Gendeh) used diluted Naropine 2mg/ml for local injection (1cc of adrenaline 1 in 80 000 is mixed with 9 cc of water, then 1cc of this solution is mixed with 9 cc of Naropine, 2mg/ml). Transoral greater palatine block was given on the affected side. Nasal packing (mixture of 1cc of adrenaline 1 in 1000, 2cc of water and 2 cc of cocaine 10 %, soaked in ½ inch ribbon gauze) was applied for 20 minutes prior to the surgical procedure.

On removal of the nasal packing a retrograde uncinectomy was performed using a 4mm, 30 degree HOPKINS telescope, for good visualization. The uncinete process was identified and fractured using RHINOFORCE-STAMMBERGER antrum punch. The uncinete process was removed infero-superiorly and a moderate-sized middle meatal antrostomy was performed. The ACP was removed by using powered instrumentation (microdebrider 30, 70 and 120 degree) and a HEUWIESER antrum grasping forcep. The microdebrider was set to a speed of 1600 rpm in oscillating mode, and suction power was set at 180 mm Hg. Saline or gentamicin wash-outs were performed to detach the ACP. Unlike the Caldwell luc operation, the intact maxillary mucosa apart from the attachment of the pedicle

was preserved during the powered instrumentation.

A transcanine microdebridement was performed if the ACP could not be completely removed by the above method. After local infiltration was given using the diluted naropine, a stab wound incision was performed above the gingivolabial sulcus at the canine fossa (Figure 1). Through the transcanine opening, the remaining antral portion of the ACP was removed using powered instruments with assistance of the 30, 70 or 120 degree nasoendoscope (Figure 2) and subsequently closed using absorbable sutures.



Figure 1: Endoscope was introduced after stab wound incision was performed above the gingivolabial sulcus at the right canine fossa.



Figure 2: Through the transcanine opening, the remaining antral portion of the ACP was removed using the debrider.

Upon completion of surgery, nasal packs (Merocel or Rapid Rhino), if required, were placed in the nasal cavity for a day. After removal of the nasal packs, daily alkaline nasal douche or sterimar nasal spray and oral antibiotics (clavulanate-potentiated amoxicillin 225 mg to 625 mg bd) were prescribed for 10 days.

RESULTS

From May 1998 to April 2008, 40 patients with ACPs underwent surgical excision at our centre. The median age of the patients was 37 years (10 to 62 years), and the male to female ratio was 1:1.4. Follow-up ranged from 3 to 60 months (Median: 30 months). None of the patients had symptoms of allergy but one patient had concomitant bronchial asthma. Three patients had an oral mass that was visible without retraction of the uvula during oral examination.

Clinical features

The most common clinical symptom was nasal obstruction (37 patients, 92.5%) followed by rhinorrhoea (45%), postnasal drip (35%) and snoring (22.5%). Other symptoms are as shown in Table 1.

Associated rhinological findings

The most common observation was chronic sinusitis, noted in 20 patients (50%). Others are shown in Table 2.

Surgical treatment

The commonest surgery was middle meatal antrostomy, performed on 35 patients (87.5%) (Table 3). Before the introduction of powered instrumentation at our institution, seven patients (17.5%) had ACPs removed by nasal forceps under endoscopic visualization. Since its introduction, ACPs were removed with

Table 1: Clinical symptoms in 40 patients with antrochoanal polyps.

Symptom	n (%)
Nasal obstruction	37 (92.5)
Rhinorrhoea	18 (45)
Post nasal drip	14 (35)
Snoring	9 (22.5)
Headache	5 (12.5)
Hyposmia	4 (10)
Lump in throat	4 (10)
Nasal discomfort	4 (10)

Table 2: Associated rhinological observations in antrochoanal polyps.

Symptom	n (%)
Chronic sinusitis	20 (50)
Septal deviation	5 (12.5)
Ethmoidal polyps	4 (10)
Choncha bullosa	4 (10)
Bilateral inferior turbinate hypertrophy	1 (2.5)

powered instrumentation in 33 patients (82.5%). Among these, six patients (15%) underwent combined transcanine microdebridement for complete removal of the antral portion of the ACPs using 30, 70 and 120 degree rigid endoscopes. There were no complications noted in the group treated with powered instrumentation.

Complications were noted in one patient (2.5%) in the group where tricut forceps was used with endoscopic visualization. This patient developed high-grade fever, purulent rhinorrhoea, facial pain and headache three weeks post surgery. All the symptoms subsided after aggressive and appropriate intravenous antibiotics, nasal toilet and decongestant therapy.

Septoplasty was performed in two patients (5.0%). This procedure was performed in view of the severely deviated nasal septum which caused nasal blockage. In addition, one patient each had frontal sinustomy performed for frontal sinusitis and inferior turbinate reduction for bilateral inferior turbinate hypertrophy.

Table 3: Distribution of rhinological surgery in 40 patients with antrochoanal polyps.

Rhinological surgery	n (%)	Complications (n=1)	Recurrences n (%)
Endoscopic polypectomy with middle meatal antrostomy.	7 (17.5)	1 (acute on chronic sinusitis)	Nil
Powered endoscopic polypectomy with middle meatal antrostomy.	28 (70)	Nil	1 (2.5)
Powered endoscopic polypectomy without middle meatal antrostomy	5 (12.5)	Nil	Nil

No major complications were noted in both cases.

Currently, our centre's practice is to use powered endoscopic middle meatal antrostomy with or without transcanine microdebridement for all new cases of ACPs. With wide middle meatal antrostomy, the inferomedial or laterally attached pedicles of ACPs can be removed via the antrostomy.

DISCUSSION

Herniation of the hypertrophic maxillary sinus mucosa through the antral ostium protruding into the oropharynx is the characteristic appearance of ACPs. They are also known as Killian polyps which are rare and tend to be dumbbell-shaped with a constriction at the natural or accessory ostium of the sinus. They are more common in men than women and usually appear before the age of 40 years (Basu et al. 2001; Drake-Lee et al 1997). However, our study showed no significant sex predilection in 40 patients (17 males and 23 females) $z = 3.615$, $P > 0.01$ with a median age of 37 years. A similar sex ratio was found in an earlier study by the same author (Gendeh et al. 2004). The aetiology of ACP remains unknown. There is no correlation between ACP and allergy (Drake-Lee et al. 1997; Soh & Tan 2000). There was only one patient who had concomitant bronchial asthma in our study.

The most common symptom was nasal obstruction (92.5%), followed by rhinor-

rhoea (45%), post nasal drip (35%) and snoring (22.5%). The less common symptoms were headache (12.5%), hyposmia (10%), lump in throat (10%) and nasal discomfort (10%). Orvidas et al. 2001, noted nasal obstruction (100%), rhinorrhoea (48%), snoring (36%) and mouth breathing (32%) in their 25 patients with ACP.

Epistaxis is an unusual manifestation of ACP. In such cases, angiofibroma must be excluded in the teenage male patient (Basak et al. 1998) and malignancy in adult patients. In our study, none of the patients had epistaxis as the presenting symptom. Nine of our patients complained of snoring, two of whom had a significant history and examination that suggested obstructive symptoms. Venkatachalam et al. (1998) reported two cases of ACP with obstructive sleep apnoea treated with endoscopic intranasal polypectomy and middle meatal antrostomy. A repeat sleep study four weeks post surgery revealed reversal of the disturbed sleep pattern.

Twenty patients (50%) in our study had chronic sinusitis, 12 patients (30%) had maxillary and ethmoidal sinusitis and six had bilateral pansinusitis (15%). Unilateral pansinusitis and maxillary sinusitis were noted in one patient each (2.5%). This is consistent with the study of Basak et al (1998), who reported that 50 % of patients had concomitant sinusitis.

Many surgical options for the treatment of ACPs have been suggested to minimize postoperative recurrence. The an-

tral portion of the ACP should be removed completely. The conventional Caldwell-Luc approach has been advocated as the most successful way to completely remove polypoidal tissue (Myers 1986). This procedure offers good exposure for removal of the antral portion of the ACP. However, it is associated with an increased risk of injury to the infraorbital nerve, postoperative cheek swelling and a longer hospital stay. It is not the recommended treatment in children because of disruption of dentition and facial growth (Myers 1986; Yanagisawa et al. 1998). None of our patients had the Caldwell-Luc surgery performed in this study.

Endoscopic surgery is an effective treatment for ACP (Myers 1986; Yanagisawa et al. 1998; Guilherme et al. 2007). In our study, 35 patients (87.5%) underwent endoscopic middle meatal antrostomy. Of these, seven (17.5%) had the antral portion of the ACP removed through the middle meatal antrostomy using the HEUWIESER antrum grasping forceps. This technique was more difficult and time consuming compared to the microdebriders. It can also lead to unavoidable stripping of the normal mucosa from its origin. The other five patients had natural widening of ostium due to the ACP. Hence, middle meatal antrostomy was not performed in these patients.

Powered instrumentation in the removal of ACPs reduces the limitations of conventional endoscopic removal (Hong et al. 2001; Yanagisawa et al. 2001). The benefit of using the powered instruments is the ability to remove tissue precisely without the stripping of adjacent mucosa, thus reducing intraoperative bleeding, better visualization and shorter hospital stay (Yanagisawa et al. 2001). Specimen collected in the tracheal trap can be sent for histological diagnosis (Sato & Nakashima 2000; Zweig et al. 2000; McGarry et al. 1997).

During the operation, if the antral portion is inferomedially or laterally based, and repeated antral washout fails to dislodge the antral polyp, a transcanine approach can be used for complete removal using microdebriders with the aid of 30, 70 and 120 degree nasal endoscopes. Hong et al. (2001), suggest a similar approach using powered instrumentation. They reported an improvement rate of 96.4% (27/28 patients). Complications such as infraorbital hyperaesthesia and abnormal facial growth were not noted in this study. Four of them relapsed where the initial operation was performed elsewhere in three patients and in one patient at our centre. Three of them underwent endoscopic polypectomy with middle meatal antrostomy and one underwent powered endoscopic polypectomy with middle meatal antrostomy. The earliest recurrence was three months post operation. One of the patients had simultaneous occurrence of an inverted papilloma which was the first case identified in our centre, hitherto unreported in the medical literature. Our study discovered one patient who presented with bilateral antrochoanal polyps. Routine history taking revealed that she was on oral contraceptive pills (OCP). Powered endoscopic polypectomy with middle meatal antrostomy was performed and she was advised to stop taking the OCP. Subsequent follow-up at four years showed no recurrence.

Our approach is similar to the technique suggested by Hong et al. (2001), but we do not routinely use the transcanine approach. Thirty three of our patients (82.5%) underwent powered endoscopic removal of ACPs. Among these, six had combined transcanine microdebridement for complete removal of the antral portion of ACP. No significant complications were noted in all cases in which powered instrumentation was used. This is consistent with the study by Hong et al (2001) and other reports.

CONCLUSION

ACP is a rare entity but should be suspected in any patient with unilateral or bilateral nasal obstruction. A thorough history and examination are warranted in all patients for its diagnosis and management. Powered endoscopic intranasal polypectomy with or without transcanine microdebridement should be the key in the treatment of ACP as this technique ensures better visualization with more complete dissection, preservation of normal adjacent mucosa and decrease the chance of recurrence.

REFERENCES

- Basak, S., Karaman, C.Z., Akdilli, A. & Metin, K.K. 1998. Surgical approaches to antrochoanal polyps in children. *Int J Pediatr Otorhinolaryngol* **46**:197-205.
- Basu, S.K., Bandyopadhyay, S.N. & Bora, H. 2001. Bilateral antrochoanal polyps. *J Laryngol Otol* **115**:561-562
- Drake-Lee, A.B. Nasal polyps. In : Kerr, A.G., Mackay, I.S., Bull, T.R. 1997. eds. *Scott-Brown's Otolaryngology: Rhinology*, 6th edition. Oxford: Butterworth-Heinemann **4**(10):1-15.
- El-Guindy, A. & Mansour, M.H. 1994. The role of transcanine surgery in antrochoanal polyps. *J Laryngol Otol* **108**:1055-7.
- Gendeh, B.S., Yeoh, T.L. & Misiran, K. 2004. Antrochoanal polyps: Clinical presentation and the role of powered endoscopic polypectomy. *Asian J Surg* **27**: 22-25.
- Guilherme, L., Eduardo, H.G., Andresa, T., Fernando, H., Catia, S. & Person, A. 2007. Endoscopic polypectomy with middle meatal antrostomy for antrochoanal polyp treatment. *Brazilian J Otorhinolaryngol* **73**(5):689-692.
- Hong, S.K., Min, Y.G., Kim, C.N. & Byun, S.W. 2001. Endoscopic removal of the antral portion of ant rochoanal polyp by powered instrumentation. *Laryngoscope* **111**:1774-1778.
- McGarry, G.W., Gana, P. & Adamson, B. 1997. The effect of microdebriders on tissue for histologic diagnosis. *Clin Otolaryngol* **22**:375-376.
- Myers, E.N. 1986. Modified Caldwell Luc approach for the treatment of antral choanal polyps. *Laryngoscope* **96**:911-913.
- Orvidas, L.J., Beatty, C.W. & Weaver, A.L. 2001. Antrochoanal polyps in children. *Am J Rhinol* **15**:321-325.
- Sato, K. & Nakashima, T. 2000. Endoscopic sinus surgery for chronic sinusitis with antrochoanal polyp. *Laryngoscope* **110**:1581-1583.
- Soh, K.B. & Tan, K.K. 2000. Sphenchoanal polyps in Singapore: diagnosis and current management. *Singapore Med J* **41**:184-187.
- Venkatachalam, P., Gupta, N., Suri, J.C. & Gandotra, S.C. 1998. Antrochoanal polyp – a cause of obstructive sleep apnoea in children. *Indian J Otolaryngol Head Neck Surg* **50**:92-93.
- Yanagisawa, E., Joe, J.K. & Pastrano, J.A. 1998. Unilateral antrochoanal polyp with bilateral nasal obstruction. *Ear Nose Throat J* **77**:177-178.
- Yanagisawa, E., Yanagisawa, K., Ho, S.Y. & Mirante, J.P. 2001. Powered endoscopic choanal polypectomy. In: Yanagisawa E. Christmas DA, Mirante JP, eds. *Powered instrumentation in Otolaryngology-Head and Neck Surgery*, San Diego:Singular/Thompson Learning :27-34.
- Zweig, J.L., Schaikin, B.M., Fan, C.Y. & Barnes, E.L. 2000. Histopathology of tissue samples removed using the microdebrider technique: implications for endoscopic sinus surgery. *Am J Rhinol* **14**:27-42.