

Main Article

ANTROCHOANAL POLYP – VALIDATING ITS ORIGIN AND MANAGEMENT BY ENDONASAL ENDOSCOPIC SINUS SURGERY (EESS)

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ABSTRACT : *Aim and Objectives : 20 fresh cases of Antrochoanal Polyps were subjected to EESS for studying the site of origin and to validate its efficacy. Study Design : This was a prospective study in which the cases were subjected to surgery and were followed up for evaluation of results. Methods : The surgery performed was an endoscopic endonasal sinus surgery preceded and followed by transcanine sinuscopy. Results/Findings : The age at the time of presentation ranged from 7-35 years. Male to female ratio was 1:1.5. Occurrence of Antrochoanal Polyp was 1.5 times more common on the left side. The mean duration of symptoms was 3 years. The main presenting symptom was unilateral nasal obstruction in 100% of cases. Allergic symptoms were noticed in 10%. Vasomotor symptom were present in 15% of the patients. Antroscopy revealed the antral part to be cystic in 100% of the cases. The site of origin of the polyp could be ascertained in only 12 out of 20 cases; in 7 of them it arose from the infrolateral wall of maxillary sinus, in 2 from the infromedial wall and in 2 it appeared to arise from the supromedial wall while in 1 from margin of the ostium. Post-surgery intra-natal remnants were found in 3 out of 20 cases i.e. in 15% of them. In two cases it was removed through maxillary ostia but in one case removed through transcanine route. Conclusions : Endoscopic Sinus Surgery is the best modality of treating Antrochoanal Polyps. We report a success rate of 95% in our series.*

Keywords : *Nasal endoscopy, AC Polyp, Transcanine sinuscopy.*

INTRODUCTION

The Antrochoanal Polyp is a benign, solitary, polypoidal lesion that arises from the maxillary sinus and grows by extension, more commonly through the antral accessory

ostium into the middle meatus and then to the choana and nasopharynx.

Choanal Polyps are more frequent in children and young adults. They are usually unilateral and can be diagnosed

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easily with the nasal endoscope. Nasal obstruction, post-nasal discharge, hyponasal voice are the most common symptoms they usually present with.

The close relationship between Choanal Polyps and the maxillary sinus was first reported by Killian in 1906 when he traced the polyps from the nasopharynx to the region of the maxillary sinus ostium but not into the sinus cavity. Kubo maintained that the Choanal Polyps originated from the maxillary sinus mucosa, just inside the ostium. Van Alyea found the Choanal Polyps, in some patients, to be attached to the lateral aspect of the maxillary sinus with a fibrous or polypoid pedicle. Mills, on the other hand, stated that the Choanal Polyps arise from blocked and ruptured acinous mucous glands during the healing process of a bacterial sinusitis, thus being the extension of a mucocele. Intramural maxillary sinus cysts, defined by Lindsay as non secreting cysts and histologically described by McGregor, are a common finding in sinus roentgenograms. Mill Born and Brown reported dome shaped cysts in the maxillary sinuses of 4% of patients who had dental roentgenograms. Grossman and Waltz found 8% of the healthy adult population had sinus cysts of various sizes.

In the treatment, since simple avulsion polypectomy is followed by a high recurrence rate (Batsakis, Neel), it is therefore common practice to remove the polyp's antral part as well. There is controversy concerning the route of removal of the antral part. Caldwell-Luc antrostomy offers a good exposure and ensures complete removal of the antral part of the polyp as well as the sinus mucosa (Schramm and Efron, Yarrington). Many side effects were reported after this procedure in the form of swelling of the cheek in the immediate post-operative period, long recovery time, and late post-operative sequelae such as numbness and anaesthesia of the cheek and devitalization of the teeth (Ophir and Marshak). Removal of the antral part via an inferior meatal naso-antral window has been advocated by Neel. However, this approach does not always allow sufficient exposure of the antral walls even after resection of the anterior half of the inferior turbinate, as has been done by Ophir and Marshak. Kamel claimed that endoscopic transnasal removal of the antral part via the maxillary ostium ensured complete removal of the polyp. However, intra-antral remnants of the polyp and a second cyst lying in an unfavourable position may be easily overlooked and is the cause of recurrence.

The present study was taken up primarily with the aim of

studying the site of origin of the Antrochoanal Polyp inside the maxillary antrum by antroscopy and secondly to validate the total removal of Antrochoanal Polyp by Endonasal Endoscopic Sinus Surgery.

MATERIAL AND METHODS

This study was conducted at the Department of Otorhinolaryngology, Guru Teg Bahadur Hospital, attached to University College of Medical Sciences, Delhi, during the period January 2001 to March 2002.

20 patients of Antrochoanal Polyp who consented to participate in the study were operated upon, the data collected and results analysed.

All patients after a detailed and elaborate history were subjected to a standard protocol of clinical examination and investigations which included inspection by anterior rhinoscopy and posterior rhinoscopy.

The radiological investigations included an x-ray paranasal sinuses — Water's view and a plain computed tomographic scan of the paranasal sinuses - axial and coronal views. The aim of the radiological investigation was to define the lesion, its nature and to know its tissue density, its site of origin, its extent and to evaluate the extent of the disease including associated other sinus involvement. A preoperative diagnostic endoscopy was performed on the operation theatre table before subjecting the patient to Endonasal Endoscopic Sinus Surgery procedure.

Local infiltration with 1:1,00,000 adrenaline and 2% xylocaine was given in the region of the attachment of uncinate process, the nasal septum, the anterior end of the middle turbinate and sublabial infiltration was given in the canine fossa region. Anterior antrostomy was made in the canine fossa region on the side of the lesion after elevating the periostium and using a 5 mm width trocar and cannula.

Through the cannula the 4 mm width Hopkins lens 0° endoscope was inserted followed by a 30° endoscope and the antral contents were visualized whether it was cystic or polypoidal in nature. Also the site of origin of the antral part of the Antrochoanal Polyp inside the antrum was noted. In cases in which the antral part was a large cyst making perception of the site of origin difficult the cyst was punctured, the fluid sucked with metallic suction passed through the cannula and the antrum was now again visualised via the transcanine route and it was seen if the site of origin

of the Antrochoanal Polyp could be appreciated once the cystic part had collapsed.

After this Endonasal Endoscopic polypectomy was performed using a 0° and 30° Hopkins lens endoscope and endoscopic Blackslee polypectomy forceps.

In cases where the choanal part was large so that its transnasal removal was difficult, the choanal part was removed transorally. After having removed the choanal and nasal part of the polyp the uncinate process was identified as a boomerang shaped mucosa covered plate of bone arising from the lateral nasal wall, the uncinate process was first palpated to delineate a groove between it and its attachment to the lateral nasal wall and an uncinectomy was performed using Cottle's knife and back biting forceps. After widening the ostium adequately, with a back biting forceps, the antral part of the polyp was removed using a right angled polypectomy forceps. While performing the removal of the antral part of the polyp, also, the site of origin of the polyp was confirmed. After having achieved the best that was possible via the endonasal endoscopic route the maxillary antrum was again visualised via the transcanine route for seeing if any remnants were left behind in the maxillary sinus. If any remnant was visualised they were again attempted to be removed via the endonasal endoscopic route and failing which they were removed via the transcanine route using a long metallic suction tip with a strong suction force, and the last resort was to widen the 0.5 cm width antrostomy opening and to remove the remnant via the transcanine route using a forceps.

After ensuring complete haemostasis anterior nasal packing was done on the operated side with medicated ribbon gauze. The sublabial incision site was sutured with absorbable suture.

The patient was prescribed analgesics and antibiotics for 5 days. The nasal pack was removed on the second post-operative day. In the post operative period the patient, after pack removal, was put on nasal douching 3 times a day for 2 weeks. The patient underwent diagnostic endoscopy under local anaesthesia after 2 weeks and 6-8 weeks of operation to see for and remove any granulations, crusts and debris. The patency of the ostium was confirmed. The sinus mucosa was seen for any remnants or recurrence of disease.

The data was collected and analysed in terms of the details of history, clinical examination radiological findings and peroperative and postoperative findings.

OBSERVATIONS

Twenty patients clinically and radiologically diagnosed as cases of Antrochoanal Polyp were operated upon for total removal of the Antrochoanal Polyp and data analysed. The age at the time of presentation ranged from 7-35 years with a mean of 17.5 years. There were 8 males and 12 females. The male to female ratio was 1:1.5 and females numbered 60% of the patients. The mean duration of symptoms at the time of presentation was 3 years with a range from 8 months to 6 years. All the cases were fresh with no history of previous surgical intervention. The occurrence of Antrochoanal Polyp was 1.5 times more common on the left side. 13 out of 20 patients had an Antrochoanal Polyp on the left side which numbered 65% of the total.

The commonest symptom the patients presented with was unilateral nasal obstruction, which was present in all the cases i.e. in 100% of cases. Nasal discharge, which was mucoid in nature was also present in all the cases i.e. 100% of cases. 15 out of 20 patients experienced sensation of foul smell i.e. in 75% of patients. All patients i.e. 100% of them experienced a change in character of voice, which became hyponasal. Relatives of 15 out of 20 patients i.e. 75% of them gave history of having noticed snoring in the patient at night. Allergic symptoms were noticed in 2 out of 20 patients i.e. 10% of the patients. Vasomotor symptom were present in 3 out of 20 patients i.e. 15% of the patients. None of the patients complained of epistaxis.

The clinical examination of all the 20 cases revealed a grayish white polypoidal mass in the nasal cavity which was insensitive to probing, did not bleed and was free all around enabling a probe to be moved all around it (Fig. 1). The posterior rhinoscopic examination revealed a pale fleshy mass obstructing the choana, either unilaterally and sometimes bilaterally (Fig. 2). The haernogram revealed significant neutrophilia in 15/20 cases i.e. 75% 4/20 had differential leucocytic counts within normal limits i.e. 20%. One patient had significant eosinophilia i.e. 5%. In almost all the cases the Computed Tomographic findings revealed a lesion of 40-50 HU intensity involving the maxillary sinus and the nasal cavity. There was no radiological evidence of polypoidal involvement in any of the other sinuses nor was there radiological evidence of inferior turbinate hypertrophy, deviated nasal septum, concha bullosa, paradoxical middle turbinate or any other anatomical variation.

The antroscopy revealed the antral part to be cystic in all the 20 cases i.e. 100% of the cases (Fig. 3). The cyst was

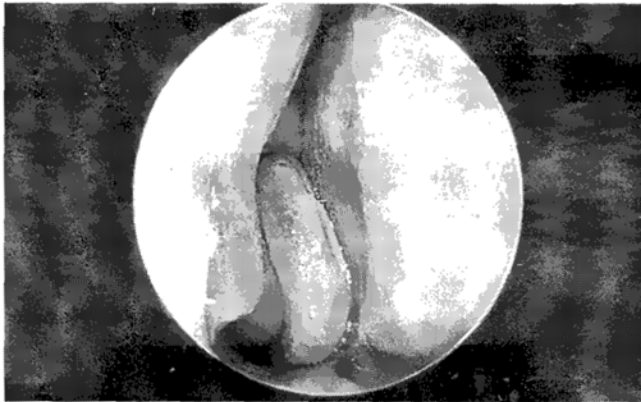


Fig. 1. Nasal part of Antrochoanal Polyp-Endoscopic view

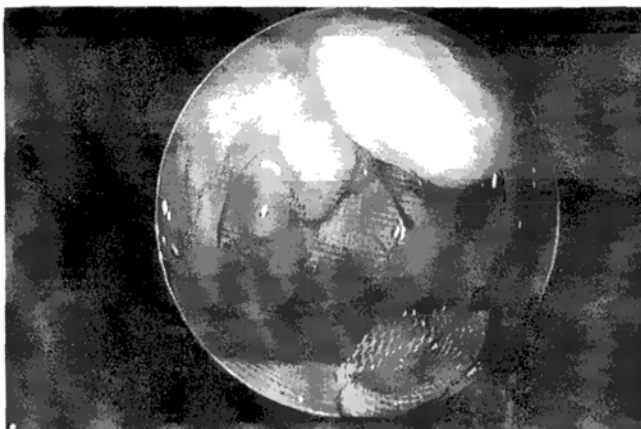


Fig. 2. Choanal part of Antrochoanal Polyp-Endoscopic view

filled with a straw coloured fluid. The site of origin of the polyp could be ascertained in only 12 out of 20 cases; in 7 of them it arose from the infrolateral wall of maxillary sinus. In 2 it arose from the infromedial wall of the maxillary sinus and in 2 it appeared to arise from the supromedial wall of the maxillary sinus while in 1 it appeared to arise from margin of the ostium i.e. had an annular origin. In the



Fig. 3. Antral part of antrochoanal polyp-Sinusoscopic view

remaining 8 patients the site of origin of the polyp could not be ascertained as the antral cystic part was found to fill the whole of the maxillary sinus antrum making visualisation of site of origin impossible, even after puncturing the cyst (Table I).

Table I. : Site of Origin

Site	Infrolateral	Infromedial	Supromedial	Annular	Uncertain
No. of pts.	7	2	2	1	8

The uncinate process was found to be atrophic in 12 out of 20 patients i.e. in 60% of them. All patients, whether the uncinate process was atrophic or not underwent an uncinectomy i.e. it was done in 100% of the cases. Accessory ostia were found in 2 out of 20 cases i.e. in 10% of them. The site of the accessory ostia in both the cases was at the root of the uncinate process close to the inferior turbinate. Ostial widening was needed in 16 out of 20 cases i.e. it was done in 80% of the cases.

The incidence of intraoperative bleeding was mild in 18 out of 20 cases i.e. 90% of them and it was moderate in amount in 2 out of 20 cases i.e. in 10% of them. In none of the cases was severe bleeding experienced. Post-surgery intra-antral remnants were found in 3 out of 20 cases i.e. in 15% of them, and out of these 3 cases in 2 of them the remnants were removed by the transnasal route using Giraffe forceps and in only 1 case was the remnant removal done via the trans canine antroscopic route as transnasal removal was not possible because the remnant arose from the supromedial wall of the maxillary sinus about 1 cm above the upper margin of the maxillary sinus ostium. In the post-operative findings 7 out of 20 patients experienced pain in the cheek which lasted on an average 3-5 days and was relieved on oral analgesic medication i.e. the incidence of after effects was seen in 7 out of 20 i.e. 35% cases. In the post-operative follow up 16 out of 20 patients reported at 2 weeks and underwent a diagnostic endoscopy. All these 16 patients were asymptomatic and the diagnostic endoscopy revealed clear nasal cavity, wide patent maxillary sinus ostium and no evidence of any intra-antral remnants or recurrence. Only 13 out of 20 patients reported for post-operative follow up at 6 weeks and all of these patients were found to be asymptomatic and the diagnostic endoscopy findings were a clear nasal cavity, wide patent maxillary sinus ostium and no evidence of intra-antral remnants or recurrence.

DISCUSSION

Antrochoanal Polyp is an inflammatory disease of the maxillary sinus. It has several controversies regarding it, like — its site of origin, pathogenesis and its appropriate and effective mode of treatment. Antrochoanal Polyps pose a challenge to the Otorhinolaryngologist with regard to many of their controversies though most of them have been solved in the recent past and the nature and behaviour of Antrochoanal Polyps is known and facts established. Besides various positive factors like inflammation in anterior ethmoids, anatomical variations in the middle turbinate and nasal septum, bacterial infection of the sinuses plays the key role causing blockage to the acinous glands inside the antrum which is supposed to produce the cysts.

Regarding the treatment there is no doubt that Antrochoanal Polyp needs to be removed completely. Conventionally

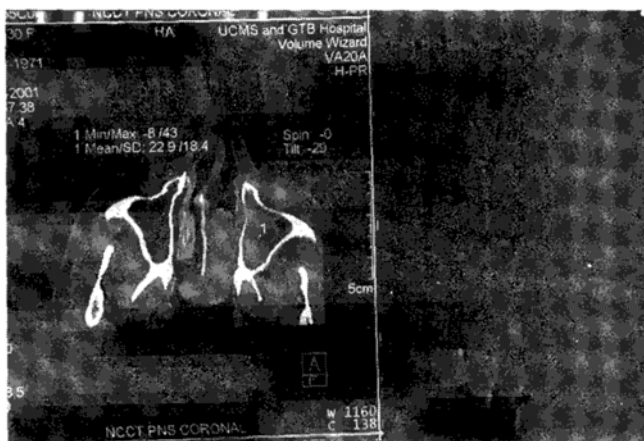


Fig. 4. CT Scan—Axial cut of Antrochoanal Polyp.

Antrochoanal Polyps were treated by polypectomy in children and Caldwell Luc operation in adults. Functional Endoscopic Sinus Surgery has been a major advancement in the management of chronic sinonasal diseases. Surgical approach to the inflammatory pathologies of the sinuses has changed remarkably since the time Messerklinger introduced the concept of Functional Endoscopic Sinus Surgery. Drainage and ventilation of maxillary and frontal sinuses are essential for maintenance of normal physiology of the paranasal sinuses and its mucous membrane. The openings of these sinuses pass through very narrow and complicated clefts of anterior ethmoids. The disorders that produce stenosis of these very narrow key areas may result in mucus retention or origin of polyps. Messerklinger

propagated that after a limited resection of the disease and cleaning of the key areas of the anterior ethmoids and re-establishment of drainage and ventilation via the natural pathways resulted in the resolution of even massive mucosal pathology in the dependant frontal and maxillary sinuses. Even those mucosal changes that were regarded as irreversible return to normal in a few weeks time (Stammberger).

In our study, our main aims and objectives were to firstly try to study and define the site of origin of Antrochoanal Polyp inside the maxillary antrum using the aid of antroscopy and secondly our aim was to validate the total removal of Antrochoanal Polyp by Endonasal Endoscopic Sinus Surgery to achieve our aims and objectives we selected 20 patients who were clinically and radiologically diagnosed as cases of Antrochoanal Polyp. They were all fresh cases with no history of surgical intervention in the past. Computed Tomographic Scan of the paranasal sinuses was done in all our patients and it revealed a soft tissue mass of 40-50 HU intensity filling the nasal cavity and extending into the maxillary antrum in all the cases. In none of the cases it revealed the presence of significant Deviated Nasal Septum, Inferior Turbinate Hypertrophy, Concha Bullosa, Paradoxical Middle Turbinate or any anatomical variants while the study done by El Guindy et al had Deviated Nasal Septum in 4 out of 24 cases so much so that it required endoscopic septoplasty before the operation to remove the Antrochoanal Polyp. In all our cases the preoperative transcanine antroscopy revealed the maxillary antrum to be filled with a cyst which had straw coloured fluid. This finding was similar to that observed by El Guindy et al who, in all of their 24 cases of Antrochoanal Polyp also found the antral part to be cystic in nature. This view is also supported by Stammberger who says that the Antrochoanal Polyp always has two components — one that is cystic which frequently fills the maxillary antrum and the other solid polypoidal which extends into the middle meatus and nasopharynx. In a study done by Deka R.C. the antra part of the antrochoanal polyp was cystic in 60% of the cases. Berg et al found that the Antrochoanal Polyp develops from an expanding intramural maxillary sinus cyst extruding through the maxillary sinus ostium into the nasal cavity. In 1909 Brown Kelly et al said that in 11 cases in which he had opened the antrum, it revealed the presence of a cyst which was continuous via ostium with the polypoidal nasal part Dingly also supports the view that the intra-antral part of the Antrochoanal Polyp is cystic in nature.

Regarding the site of origin of the Antrochoanal Polyp inside the maxillary antrum we found that the site of origin of the polyp could be ascertained in only 12 out of 20 cases; in 7 of them it arose from the infrolateral wall of maxillary sinus. In 2 it arose from the infromedial wall of the maxillary sinus and in 2 it appeared to arise from the supromedial wall of the maxillary sinus while in 1 it appeared to arise from margin of the ostium i.e. had an annular origin. In the remaining 8 patients the site of origin of the polyp could not be ascertained as the antral cystic part was found to fill the whole of the maxillary sinus antrum making visualisation of site of origin impossible, even after puncturing the cyst. In the study done by El Guindy et al the findings regarding the site of origin of the Antrochoanal Polyp inside the maxillary antrum were that it arose from the medial wall of the maxillary sinus in 5 cases, from the lateral wall of the maxillary sinus in 14 cases and the site of origin of the polyp could not be ascertained in 5 cases. In a study done by Berg et al, they reached at the conclusion that the 15 cases of Antrochoanal Polyp which they studied had the site of origin of the polyp from the infrolateral wall of the maxillary sinus. In a study done by Deka R.C. 45% of his cases had attachment in the posterior medial wall of the antrum adjoining the posterior fontanelle. In 15% the site of origin could not be precisely evaluated.

Keeping in view the findings regarding the site of origin of the Antrochoanal Polyp inside the maxillary antrum seen in our study it can be concluded that the commonest site of origin of the Antrochoanal Polyp inside the maxillary antrum is from the inferolateral wall of the maxillary sinus.

In the pre-operative findings out of the 20 cases we operated we found the uncinat process to be atrophic in 12 cases i.e. in 60%. The probable explanation for this findings is the pressure effect exerted by the growing nasal part of the Antrochoanal Polyp. In the study done by El Guindy et al they found significant atrophy of the uncinat process to be present in 2 out of 24 cases. The presence of accessory ostia were seen in 2 out of 20 patients we studied. These accessory ostia were present in the root of the uncinat process while Stammberger supports the view that in most of the cases of Antrochoanal Polyp the polyp exits the maxillary antrum through the accessory ostium. This view is still supported because it may be that the 2 cases in which we observed the presence of accessory ostium were the ones in which the accessory ostia were present separately and in others it may be that the accessory ostia may have merged with the natural ostium.

In the surgical details, the uncinat process is first palpated to delineate a groove between it and its attachment to the lateral nasal wall. After this an infundibulotomy is done by incising the uncinat process throughout its length by a sickle knife or backward biting forceps. The maxillary ostium is usually hidden by the lower one-third of the posterior inferior part of the uncinat process. When this is removed the maxillary ostium comes into view and then it is ascertained whether a further widening of the maxillary ostium is really required or not. It is not essential to have a maxillary ostium of certain dimensions, as only a functional ostium is important. If the maxillary ostium has to be widened it is usually done at the expense of the anterior fontanelle. It is essential to remove the posterior inferior one-third of the uncinat process since otherwise the natural maxillary ostium may be totally missed and accessory ostium may be taken to be the natural ostium. This results in a situation called the 'missed ostium sequence', which can then result in a circular mucociliary flow causing a recurrence of sinusitis. Widening of the natural ostium should not be performed in a circumferential manner to prevent the post-operative cicatrization.

In our study after satisfactorily performing polypectomy via the Endonasal Endoscopic route we found that in 1 case there was an **intra-antral** remnant tag left attached to the medial wall of the maxillary sinus just 1 cm superior to the natural ostium. In the study done by El Guindy et al he found the remnants in the maxillary antrum in 5 out of 24 cases. These remnants in our study as well as El Guindy et al's study had to be removed by the transcanine route. The figure of 1/20 (in our study) and 5/24 (in El Guindy et al's study) is amounting to 5% and 20% respectively.

In the post-operative follow up 16 out of 20 patients reported at 2 weeks and underwent a diagnostic endoscopy. All these 16 patients were asymptomatic and the diagnostic endoscopy revealed clear nasal cavity, wide patent maxillary sinus ostium and no evidence of any intra-antral remnants or recurrence. Few patients followed upto 4 months, showed no synechia formation, cicatrization and recurrence of disease.

In the recent time, successful results of Endonasal endoscopic removal of the antral of the Antrochoanal Polyp has been reported (Killain, Levine).

Endonasal Endoscopic Sinus Surgery has revolutionized the treatment of sinonasal diseases as it re-establishes ventilation

and mucocilliary clearance by limited resection of the inflammatory pathology or the anatomical defects present and it is an effective and efficient method of treating Antrochoanal Polyps as it ensures total removal of the polyp leaving behind no intra-antral remnants and not to mention at the cost of minimal or no side effects at all.

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