Sphenochoanal Polyps in Singapore: Diagnosis and Current Management

K B K Soh, K K Tan

ABSTRACT

Sphenochoanal polyp is a rare form of choanal polyp. If unrecognised, they can be mistaken for an antrochoanal polyp. This will result in unnecessary exploration of the maxillary sinus, and a failure to remove the sphenoidal component of the sphenochoanal polyp. Adequate preoperative evaluation with computed tomography or magnetic resonance is mandatory to ascertain the correct diagnosis, and to facilitate the planning of the appropriate surgical procedure. We present two patients with sphenochoanal polyp and a review of the literature.

Keywords: antrochoanal, choanal, maxillary sinus

INTRODUCTION

A sphenochoanal polyp is a solitary mass that arises from the sphenoid sinus. It exits through the sphenoid ostium, passes across the sphenoethmoidal recess, and reaches into the choana. It is commonly mistaken for its more common counterpart – the antrochoanal polyp. It is a diagnosis that may confuse the unsuspecting rhinologist. Both types of choanal polyps produce similar symptoms and clinical complaints, with indistinguishable clinical endoscopic findings. Furthermore, many otolaryngologists have encountered antrochoanal polyps in the course of their training and practise, but the same cannot be said of sphenochoanal polyps. The tendency is therefore to conclude prematurely that a choanal polyp should be antral in origin, and a Caldwell Luc operation or middle meatal antrostomy is indicated. This paper serves to highlight the need to be constantly vigilant as sphenochoanal polyps may occasionally spring surprises at rhinologists.

Case One

A 38-year-old healthy Indian man presented in December 1996 with right-sided nasal obstruction and snoring for one year. There was no previous history of allergic rhinitis or atopy. He did not have any otological

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symptoms. Examination revealed a nasal polyp that was filling the entire right nasal cavity. The polyp was also visible on mirror examination of the nasopharynx. A coronal computed tomography (CT) of the sinuses (Fig. 1) demonstrated partial opacification of the right sphenoid sinus. The sphenoid mass was contiguous with the intranasal one, and was extending posteriorly through the right posterior choanae into the nasopharynx. The other paranasal sinuses were normal.

Intraoperatively, a microdebrider was used under endoscopic guidance to reduce the bulk of the polyp. The stalk of the polyp was identified after the main mass was debulked. By tracing the stalk proximally, we were able to confirm its exit through the ostium of the sphenoid sinus. The sphenoid ostium was noted to be enlarged by the stalk. Further widening of the sphenoid ostium was carried out with a Kerrison punch forcep in a medial and inferior direction. The sphenoid ostium was widened to allow access for the removal of the sphenoidal component of the polyp. The sphenoidal component was noted to be thick walled and cystic. Histopathology confirmed a benign sinonasal polyp with stromal oedema, thickened basement membrane, non-specific lymphocytic infiltrate and prominent eosinophils. Postoperatively, the patient's symptoms resolved completely. Follow-up at 6 months revealed the sphenoid ostium to be large and patent. The sphenoid sinus had re-epithelialised, and there was no evidence of polypoidal regrowth.

Fig. 1 A sphenoid opacity giving rise to a choanal mass. The maxillary sinus is normal.

Case Two

A 20-year-old Malay man presented in June 1996 with right-sided nasal obstruction and snoring for 3 months. This was not associated with symptoms of allergic rhinitis or atopy. Endoscopic examination revealed a polyp filling the whole of the right nasal cavity. The polyp could also be visualised in the nasopharynx on mirror examination. Plain radiographs showed clear maxillary sinuses. Computed tomography of the sinuses (Fig. 2) revealed an opaque right sphenoid sinus which was continuous with that of the nasal opacities. There was no abnormality noted in the ethmoid, frontal and maxillary sinuses.

During surgery, the choanal polyp was reduced with a microdebrider under endoscopic guidance. The stalk of the polyp was traced to the sphenoid ostium in the spheno-ethmoidal recess. The sphenoid ostium was enlarged in a medial and inferior direction. The sphenoidal component of the polyp was then removed. Histopathology examination showed a benign sphenochoanal polyp with oedematous stroma, respiratory type epithelial lining, thickened basement membrane, and a non-specific cellular infiltrate mixed with eosinophils. The patient made a good post-operative recovery. On examination 6 months later, the sphenoid sinus revealed good re-epithelialisation with normal healthy mucosa.

DISCUSSION

A choanal polyp is defined as an isolated solitary sinus mass or cyst which has passed through the sinus ostia and protruded into the boundary between the nasal cavity and nasopharynx, the choana[1-3]. Two well-recognised forms occur, the common antrochoanal polyp and the rare sphenochoanal polyp. Ethmoidochoanal polyps have also been described but are extremely uncommon[4]. There is controversy as to whether ethmoidochoanal polyps are different from the common nasal polyp originating from the ethmoid air cells. The anatomic variation of the ethmoid labyrinth, and the ill-defined junction between ethmoid and nasal mucosa, make it difficult to precisely identify the site of origin of an ethmoidal polyp. The presence of clefts in the ethmoid labyrinth instead of discrete ostia in the maxillary and sphenoid sinuses, make it difficult to determine where the polyps arise. Choanal polyps have not been reported to originate from the frontal sinus.

It is not known what causes choanal polyps. Attempts have been made to link it with IgE-mediated allergies. However, allergic patients are not predisposed to choanal polyp formation. Patients with choanal polyps are not more likely than the general population to have allergic disease or atopy. Most patients are totally free of rhinologic symptoms after surgical extirpation of the
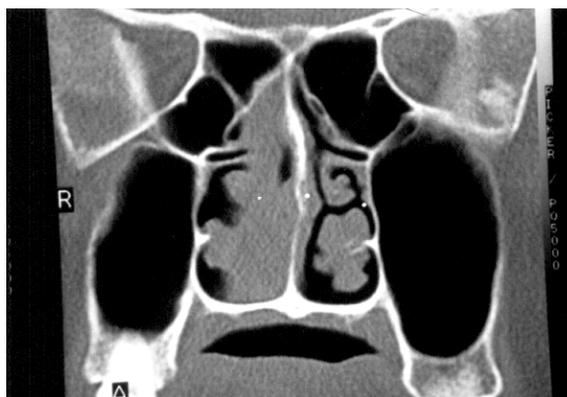

Fig. 2 A sphenoid opacity which is causing widening of the sphenoid ostium and giving rise to a choanal polyp. The maxillary sinus and posterior ethmoid sinuses are normal. The mass lies between the middle turbinate and nasal septum, leaving the ostiomeatal complex free of pathology.

choanal polyp, as noted in our two cases. Laboratory investigation with RAST testing for specific allergens and skin prick tests has yielded the general impression that choanal polyp formation is unrelated to allergy[3-5]. In spite of the general opinion that choanal polyps are not thought to be associated with allergic disease, a recent study[6] found a significant association between allergic disease with the formation of choanal polyps.

It is suggested that choanal polyps develop from a precursor intramural cyst in the antrum or sphenoid sinus[7]. Benign intramural cysts are a fairly common occurrence, found in 4% of the normal asymptomatic population. They have the potential to gradually enlarge, exit through the ostium, and develop into a choanal polyp. Berg[7] was able to demonstrate macro architectural and microarchitectural similarities between the sinus component of a choanal polyp and the common intramural cyst. Cyst fluid aspirated from choanal polyps had a similar distribution and concentration of proteins to that found in the common intramural cyst.

Choanal polyps may occasionally degenerate into angiomatous polyps[3,8]. These are non-neoplastic lesions that should be managed in the same fashion as choanal polyps. Because of increased vascularity, they may be confused with less benign vascular lesions such as nasopharyngeal angiofibromas. Even on CT, the vascularity of an angiomatous polyp may be confused with other nasopharyngeal tumours or angiomas. Angiomatous degeneration of choanal polyps takes place as a result of occlusion and compression of vessels at vulnerable sites in the polyp[3]. These occur at the ostial opening, and in dependent areas of the polyp. The polyp then undergoes a sequential process involving dilatation and stasis of blood flow, oedema, infarction, neovascularisation, repeat occlusion and re-infarction. The process continues until there is either total necrosis or, more commonly, angiomatous degeneration.

Angiomatous polyps have been accompanied by the presence of pseudosarcomatous cell changes and stromal atypia[9-11]. These changes are a result of tissue inflammation and trauma, and do not carry the implications that are normally associated with the word "sarcoma". The clinical significance in recognising such changes is in the fact that they may be confused with a malignant sarcomatous lesion.

Choanal polyps may also occur in children. These deserve special consideration as they must be differentiated from meningoencephalocoeles, juvenile angiofibromas and other nasopharyngeal masses[12]. A choanal mass in a child must not be presumed to be an antrochoanal polyp, or even a sphenochoanal polyp. The first priority is to exclude brain hemiation or gliomas. Computed tomography or magnetic resonance imaging must be done in every case to rule out defects in the bony skull base.

Sphenochoanal polyps are extremely rare[13]. Although antrochoanal polyps have been described since 1906[14], sphenochoanal polyps were described much later[15]. This is a reflection of the fact that sphenochoanal polyps occur much less frequently, and are therefore more likely to be missed in diagnosis. They can be mistaken as an antrochoanal polyp if care is not taken to elucidate the origin of a choanal polyp[5]. Choanal polyps must not be assumed to be antrochoanal polyps until they have been proven to be so.

Cases have been described where a sphenochoanal polyp was mistaken as having an origin in the maxillary sinus, resulting in the inappropriate operation being performed[5]. The maxillary sinus had been unnecessarily opened and explored. Even more unfortunate was the fact that the polyp recurred because the original problem in the sphenoid sinus had not been dealt with adequately.

In the second case of our report, it was with the aid of CT of the sinuses that the correct diagnosis became evident. The diagnosis of a sphenochoanal polyp was made on the basis of a clear maxillary sinus and a sphenoid mass that was contiguous with the intranasal polyp.

It is difficult to distinguish a sphenochoanal polyp from an antrochoanal polyp clinically. Clinical presentation, endoscopic examination or biopsy are unreliable in making that distinction[7]. Both types of choanal polyp have an equal sex distribution[15,16], and tend to affect those who are below 40 years old[2]. Both antrochoanal and sphenochoanal polyps present most commonly with unilateral nasal obstruction, as did both our cases. Others may present with nasal discharge, facial pain, eustachian tube dysfunction, otological symptoms[5-13], snoring, chronic purulent nasal discharge, or an oropharyngeal mass. The polyp will usually occupy the whole nasal cavity and nasopharynx, thus making it difficult to determine its origin. Larger polyps may descend into the oropharynx, presenting as an oropharyngeal mass and interfering with eating. Finally, both types of choanal polyps are indistinguishable histologically[7] making it impossible to differentiate the two on that basis.

The best way to distinguish an antrochoanal polyp from a sphenochoanal polyp is with the use of computed tomography or magnetic resonance imaging of the paranasal sinuses[1,13,17]. Because of its hypocellularity, choanal polyp appear as a hypoattenuating lesion on computed tomography[13,17]. In cases with a solitary sinus involvement, it is easy to determine if the choanal polyp is antral or sphenoidal in origin. Both cases we described had isolated sphenoidal involvement without evidence of pathology in other sinuses.

The diagnostic distinction becomes more difficult if both the maxillary antrum and sphenoid sinus are affected. Two possibilities arise: first, an antrochoanal polyp may have obstructed the sphenoid ostium causing a secondary sphenoid sinusitis. Alternatively, a sphenochoanal polyp could have obstructed the ostiomeatal complex causing maxillary sinusitis. Both situations require different approaches to surgical management. Computed tomography, unfortunately, is unable to make the distinction between intrasinus polyp, cyst or sinusitis. To resolve this dilemma, one of the following methods may be adopted.

One may scrutinise the region of the ostiomeatal complex and the sphenoethmoidal recess on the computed tomographic images[13,17]. An antrochoanal polyp exits through either a natural ostium, an accessory ostium or a surgically created defect. It then fills up the ostiomeatal complex en-route to the choana. A sphenochoanal polyp however exits through the sphenoid ostium, and passes though the sphenoethmoidal recess en-route to the choana.

A second method is to study the relationship of the choanal polyp with respect to the middle turbinate[13,17]. The middle turbinate is a major landmark in functional sinus surgery. It also holds the key to determining the source of a choanal polyp. Sphenochoanal polyps pass between the nasal septum and the medial aspect of the middle turbinate, leaving the middle meatus clear (Fig. 2, 3). Antrochoanal polyps, however, pass between the lateral surface of the middle turbinate and the lateral wall of the nose.

A third method is to look for a widened maxillary or sphenoidal ostia secondary to compression by the stalk of the choanal polyp[13]. If the sphenoid ostium is widened, and there is demonstrable continuity between the sphenoid opacity and the choanal polyp through the ostium, then the lesion is a sphenochoanal polyp. Likewise, if the maxillary ostia is widened, and the antral

opacity is contiguous with the choanal polyp through the middle meatus, then the lesion is antrochoanal.

The management of sphenochoanal polyp is surgical. This involves the removal of both intranasal and intrasphenoidal components[2,5,18,19]. The experience with surgical management of antrochoanal polyps has demonstrated that simple avulsion of the polyp is inadequate. Though quick and simple, polyp removal with forceps or snares will result in a 25% rate of recurrence. The techniques and surgical approaches involved in the management of choanal polyps has been well described by Kamel[18]. He was able to obviate the need for a Caldwell Luc procedure by successfully removing the antral component through a middle meatal antrostomy.

We have found that the endoscopic transnasal approach to the sphenoid sinus with a microdebrider is ideal for removing sphenochoanal polyps. By carefully following the route taken by the pedicle of the polyp, the surgeon is able to visually trace the pedicle to the offending sinus. The gradual debulking of the polyp with a microdebrider facilitates this process. The microdebrider therefore assumes not only a therapeutic role, but a diagnostic one as well. We do not recommend preliminary polyp avulsion with forceps or snares. This usually tears the pedicle proximally, allowing the remnant stalk to retract into the sinus, thus leaving no trace for the surgeon to follow.

Another advantage of using the microdebrider to follow the polyp is that it leads the surgeon to the correct ostium. This advantage holds true even if the correct diagnosis of a sphenochoanal polyp had been made with the help of computed tomography or magnetic resonance imaging. The opening of the sphenoid ostium lies in a variable position on the anterior sphenoid wall. By following the pedicle into the sphenoid sinus, the task of having to search for the spenoid ostium is simplified. After proper identification of the sphenoid
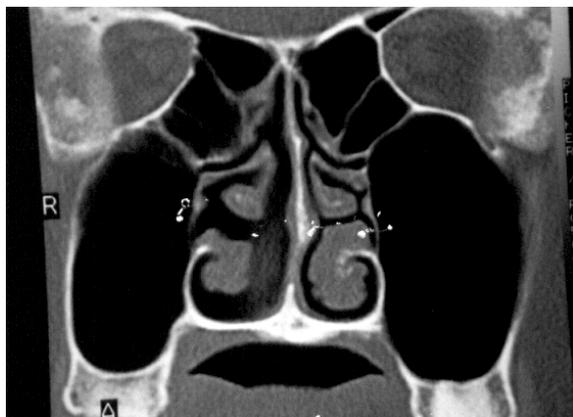
ostium, it is widened in a medial and inferior direction to avoid injuring the optic nerve and carotid artery. Ostial widening serves two purposes. Firstly, it improves visualisation and safe endoscopic extirpation of the intra-sphenoidal component. Secondly, it facilitates postoperative monitoring of the sphenoid sinus for recurrence.

CONCLUSION

Sphenochoanal polyp is a rare form of choanal polyp. Failure to recognise its existence may result in an erroneous diagnosis of antrochoanal polyp. This will lead to the performance of the wrong operation, unnecessary exploration of the maxillary sinus, and inadequate treatment of the sphenoid sinus. A risk of recurrence is associated with incomplete surgical excision.

ACKNOWLEDGEMENT

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Fig. 3 A choanal mass lying between the middle turbinate and nasal septum. Even in the absence of pathology in any of the sinuses, this appearance is suggestive of a sphenochoanal polyp.