

Main Article

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Significance of nasal septal deviation among patients with antrochoanal polyp

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Abstract

Objective. This study aimed to examine the association between nasal septal deviation and antrochoanal polyp.

Methods. This was a retrospective review of medical records and imaging of patients who underwent endoscopic sino-nasal surgery for antrochoanal polyp.

Results. Forty-eight patients operated on for antrochoanal polyp between 2009 and 2019 were eligible for the study. The median age was 32 years, and 52.1 per cent were male. Antrochoanal polyp was diagnosed equally in the right and left nasal cavities. Septal deviation was present in 77 per cent of such cases. In 44 per cent of septal deviation cases, the antrochoanal polyp was ipsilateral to the deviation, which was not statistically significant. The type of deviation according to the Mladina classification was not correlated with the laterality of septal deviation and antrochoanal polyp.

Conclusion. The laterality of the septal deviation was not found to be correlated with that of the antrochoanal polyp. Therefore, performing routine septoplasty during antrochoanal polyp surgery is unnecessary unless the deviation interferes with the complete extraction of the polyp.

Introduction

Antrochoanal polyp is a benign lesion that arises from the maxillary sinus mucosa, extends through the main or accessory ostium towards the middle meatus, and protrudes posteriorly to the nasopharynx.¹ It is usually unilateral, although rare cases of bilateral lesions have been reported.² Antrochoanal polyp represents about 4–6 per cent of all nasal polyps in the general population, and it is more common among children and young adults.³ The most common presenting symptom is nasal obstruction. Other less frequent complaints are rhinorrhoea, epistaxis and snoring.⁴ The ‘gold standard’ methods for antrochoanal polyp diagnosis are nasal endoscopy (Figure 1) and computed tomography (CT) (Figure 2).

The pathogenesis of antrochoanal polyp is not fully understood. Chronic processes of the nasal cavity (e.g. chronic sinusitis and allergic rhinitis) are among the main aetiologies implicated in the development of antrochoanal polyp.^{5–7} Other theories include lymphatic obstruction, dental trauma and microvascular disease.⁸ The role of anatomical pathologies, including septal deviation, concha bullosa and turbinate hypertrophy, is controversial. Based on the Bernoulli phenomenon, it was hypothesised that a narrowing of the nasal passage as a result of these alterations creates a negative pressure that encourages herniation of the polyp through the maxillary sinus into the nasal cavity.⁷

Our study aimed to examine the association between deviated nasal septum and antrochoanal polyp, and to promote decision-making when these two pathologies co-exist.

Materials and methods

This study was a collaboration between two tertiary medical centres. We retrospectively reviewed electronic medical records of patients diagnosed with antrochoanal polyp and referred to surgery at either one of our medical centres between 2009 and 2019. Patients who had undergone septoplasty in the past or did not have a CT scan prior to surgery were excluded. The data collected included demographic details, presenting symptoms, disease side and surgical parameters.

Senior rhinologists from each centre reviewed the CT scans of patients and determined the presence of septal deviation and its laterality in relation to that of the antrochoanal polyp. In order to explore the effect of the deviation shape, we used the classification proposed by Mladina⁹ (Table 1) and assigned each septal deviation its type based on the CT scan.

Statistical analyses were performed using SPSS[®] (version 26) statistical software. A chi-square test was conducted to evaluate the association between septal deviation and polyp laterality and to examine the effect of the type of deviation.

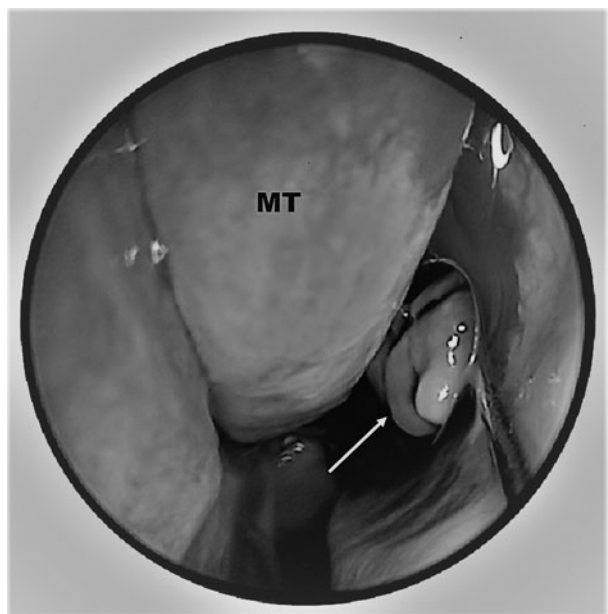


Figure 1. Endoscopic view of the left nasal cavity. The white arrow points to the remnant of the antrochoanal polyp seen through a widened accessory ostium of the maxillary sinus. MT = middle turbinate

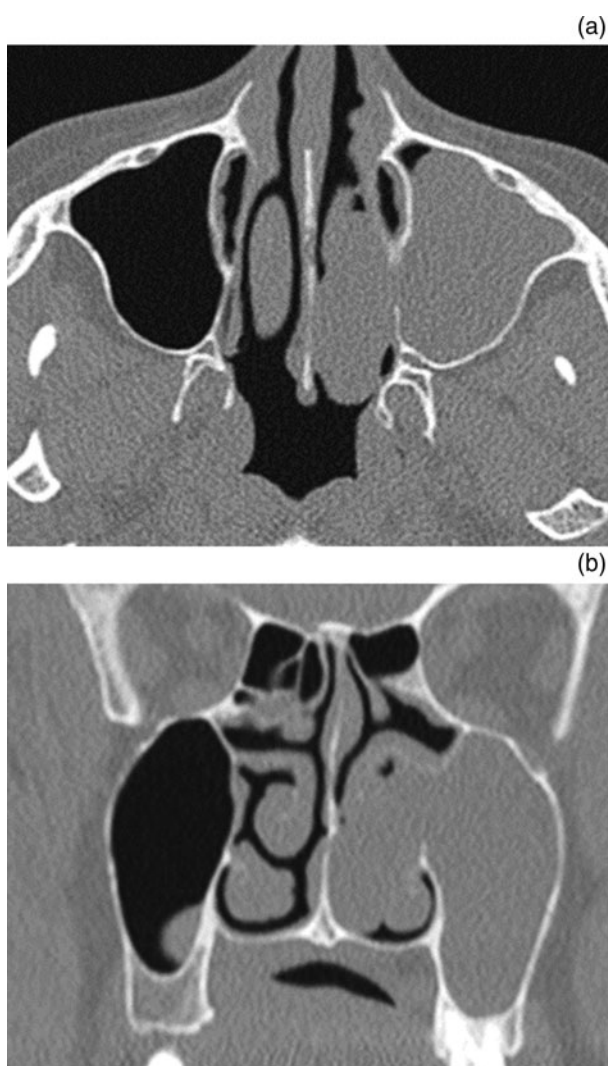


Figure 2. Computed tomography of paranasal sinuses showing soft tissue opacity filling the maxillary sinus and nasal cavity in (a) axial plane and (b) coronal plane.

Results and analysis

Eighty-seven patients were operated on for antrochoanal polyp in the participating medical centres during the study period. Thirty-nine patients were excluded (35 patients who did not have a CT scan prior to surgery and 4 who had undergone septoplasty in the past). Thus, 48 patients were included in the final analysis. Their demographic details and clinical features are presented in [Table 2](#).

Antrochoanal polyps were found equally on both sides of the nasal cavity. Deviation of the septum was present in 37 patients (77.1 per cent); its laterality is detailed in [Table 2](#). In order to gain access and remove the antrochoanal polyp completely, simultaneous septoplasty was performed in 11 (22.9 per cent) patients.

Antrochoanal polyp was found ipsilaterally to the side of the deviated septum in 21 of 48 patients (43.75 per cent), as presented in [Figure 3](#). No statistically significant correlation was found between the side of the antrochoanal polyp and the laterality of the deviated septum ($p = 0.664$).

[Table 3](#) depicts the frequency of the different types of deviation according to the Mladina classification in our cohort. No statistically significant association was found between the type of deviation and the laterality of the antrochoanal polyp and deviated septum ($p = 0.159$).

Discussion

Although the first description of antrochoanal polyp dates back to 1906, its pathogenesis has not been clarified to this day, and several theories have emerged. Berg *et al.*¹⁰ found macro- and microscopic similarities between the antral part of antrochoanal polyps and the intramural cyst of the maxillary sinus. Thus, they hypothesised that antrochoanal polyp develops from an expanding intramural cyst. Chronic inflammation, infectious or allergic, has also been suggested as an aetiological factor. Chen *et al.*⁵ argued that mucous gland obstruction caused by inflammation leads to the development of the cystic part of antrochoanal polyp. In contrast, Piquet *et al.*¹¹ claimed it was secondary to stenosis of the lymph duct caused by chronic phlogosis. Lee and Huang¹² supported chronic sinusitis as an aetiological factor because over half of their patients had a history of chronic sinusitis.

- The antrochoanal polyp is almost always a unilateral lesion
- It represents about 5 per cent of all nasal polyps in the general population and is more common among children and young adults
- The role of nasal septum deviation in antrochoanal polyp pathogenesis is controversial
- The antrochoanal polyp side does not correlate with the laterality and Mladina type of nasal septum deviation
- Septal deviation repair is not mandatory as a part of a surgical procedure for the antrochoanal polyp unless the deviation prevents a complete excision of the lesion

What causes the cyst to herniate outside the maxillary sinus is also not fully understood. Frosini *et al.*⁷ suggested that increased pressure inside the maxillary sinus resulting from simultaneous obstruction of the accessory and natural ostium is the cause. In their review of 200 cases, nasal disorders (e.g. septal deviation, inferior turbinate hypertrophy and concha bullosa) were present in 83 per cent of patients and, as a group, was the only factor associated with antrochoanal polyp. They suggested that these anatomical alterations could further increase the pressure gradient between the maxillary

Table 1. Mladina classification for nasal septal deviation

| Type | Detail |
|--------|---|
| Type 1 | Unilateral vertical septal ridge in the valve region that does not reach the valve itself; it does not change the physiological valve angle (15°) & therefore usually plays just a mild role in the nasal pathophysiology |
| Type 2 | Unilateral vertical septal ridge in the valve region that touches the nasal valve, thus diminishing the physiological valve angle (<15°) |
| Type 3 | Unilateral vertical ridge that is located more deeply in the nasal cavity, opposite the head of the middle turbinate |
| Type 4 | Bilateral deformity consisting of type 2 on one side & type 3 on the other |
| Type 5 | Almost horizontal septal spur that sticks laterally & deeply into the nasal cavity. The opposite side of the nasal septum is always flat |
| Type 6 | Massive unilateral intermaxillary bone wing with a gutter between it & the rest of the septum on this septal side. On the other septal side, there is an anteriorly positioned basal septal crest |
| Type 7 | Very variable combination of the previous types |

Table 2. Patient demographic and clinical details*

| Parameter | Value (n (%)) |
|---------------------------------|---------------|
| Gender (n (%)) | |
| - Male | 25 (52.1) |
| - Female | 23 (47.9) |
| Age (median (range); years) | 31.5 (5-70) |
| Presenting symptoms (n (%)) | |
| - Nasal obstruction | 35 (72.9) |
| - Rhinorrhoea | 19 (39.6) |
| - Facial pain | 9 (18.8) |
| - Epistaxis | 2 (4.2) |
| - Post-nasal drip | 2 (4.2) |
| Nasal septum morphology (n (%)) | |
| - No deviation | 11 (22.9) |
| - Deviation to the right | 20 (41.7) |
| - Deviation to the left | 17 (35.4) |

*n = 4

sinus and middle meatus and thus play a role in the pathogenesis of antrochoanal polyp. Consistent with this, Hekmatnia *et al.*¹³ also found an association between antrochoanal polyp and septal deviation. However, none of these studies referred to the laterality of the deviated septum. Although Balıkcı *et al.*¹⁴ found septal deviation in half of their patients,

Table 3. Types of nasal septal deviation according to Mladina classification*

| Type of septal deviation | Patients with ACP ipsilateral to the deviation side (n (%)) | Patients with ACP contralateral to the deviation side (n (%)) |
|--------------------------|---|---|
| Type 1 | 5 (13.5) | 7 (18.9) |
| Type 2 | 2 (5.4) | 4 (10.8) |
| Type 3 | 9 (24.3) | 5 (13.5) |
| Type 4 | 0 (0) | 1 (2.7) |
| Type 5 | 0 (0) | 4 (10.8) |

*n = 37. ACP = antrochoanal polyp

it was not different from the incidence in the general population.¹⁵

In our study, there was no correlation between the laterality of the septal deviation and the side of antrochoanal polyp growth. We believe this is because not all septal deviations were significant enough to cause a narrowing of the nasal passage that was sufficiently substantial to change the pressure within the nasal cavity. The different findings of our study can be explained, firstly by the fact that the presence of septal deviation is based, at least to some degree, on the physician's subjective opinion (particularly in cases of mild deviation). Secondly, there are different methods for evaluating the septum (e.g. anterior rhinoscopy, endoscopy, imaging) without uniformity between the studies.

Our study has two main limitations. Because of its retrospective nature, clinical data on the history of chronic sinusitis

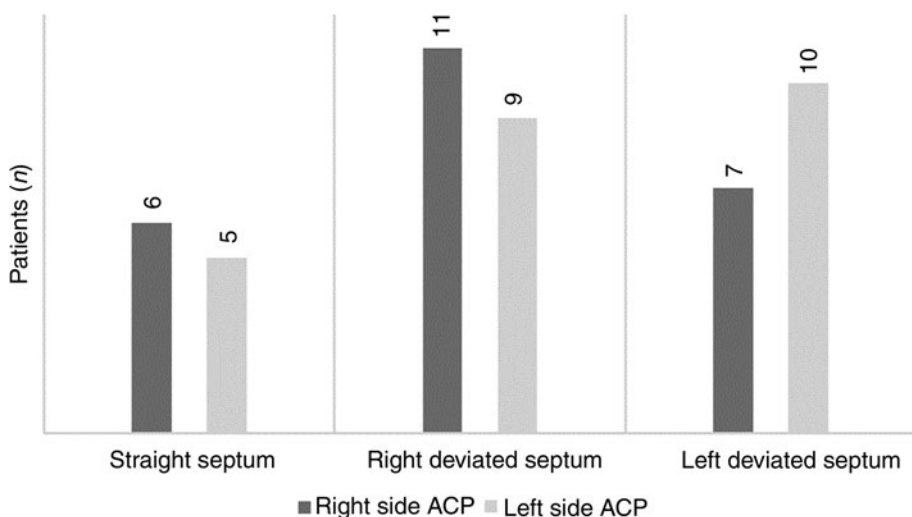


Figure 3. Bar chart presenting the laterality of the antrochoanal polyp in relation to the side of the deviated nasal septum. ACP = antrochoanal polyp

were missing for a portion of the participants and therefore could not be analysed. Furthermore, we could not measure the airflow within the nasal cavity and thus objectively assess the influence of the deviated septum.

Conclusion

Septal deviation was not found to be associated with antrochoanal polyp. Therefore, routine repair of such deviation as part of a surgical procedure for antrochoanal polyp is not mandatory unless it prevents a complete excision of the lesion.

Competing interests. None declared

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