

TO STUDY THE ROLE OF CONCHA BULLOSA IN THE AETIOLOGY OF DEVIATED NASAL SEPTUM (DNS) AND SINUSITIS

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ABSTRACT

AIMS AND OBJECTIVES

To study the role of concha bullosa in the development of deviated nasal septum (DNS) and sinusitis.

MATERIAL METHODS

235 CT scans of paranasal sinuses done from March 2022 to November 2022 were studied and evaluated for the presence of concha bullosa, DNS and sinusitis.

RESULTS

Among 235 CT scans concha bullosa was found in 74(31.4%) patients. Among these patients, concha bullosa coexisting with DNS was found in 56(75.7%) patients. Now, among these air column between concha bullosa and the septum was found in 43 (76.7%) patients. Sinus disease was present in 48(64.8%) patients.

CONCLUSION

Concha bullosa has a strong association with the existence of concomitant DNS. However, the presence of air column may exclude the role of concha bullosa in the aetiology of DNS.

Presence of concha bullosa may predispose to Sinusitis.

KEYWORDS: Concha, Deviated Nasal Septum, Sinusitis,

INTRODUCTION

Concha Bullosa is a pneumatized middle turbinate found in about 14 to 53% of the population. It can be either unilateral or bilateral, with or without septations. Although it is not considered as a separate pathology but it may lead to diseased sinuses and deviations in nasal septum. Most of the patients are asymptomatic and presence of concha bullosa is usually an incidental finding during evaluation of the patients with rhinology complaints.

Deviated nasal septum (DNS) is any deviation of the septum of nose from the midline.

Nasal Septum is formed by the tectoseptal process which descends in the midline to meet the developing palate. Any defect in the development leads to its deviation from the midline manifesting as nasal obstruction,

epistaxis, sinusitis, anosmia, external nasal deformity and middle ear infections.

Sinusitis is the inflammation of the mucosa of paranasal sinuses. The paranasal sinuses develop in such a way that they drain into the nasal cavity through their natural ostia. Any obstruction due to and cause may result in the impairment of the sinus drainage pathways leading to sinusitis.

A lot of patients with concha bullosa have been found to have a coexistent DNS and sinusitis suggesting a role in their aetiology. As a result of increased size of the middle turbinate out of proportion to its actual growth as a consequence of its pneumatization, development of septum may not occur in midline resulting in DNS. The concha bullosa occupies a significant space in the nasal cavity causing obstruction of sinus drainage pathways leading to sinusitis.

Here in this retrospective study we have studied the CT PNS of the patients for the relationship between Concha bullosa and DNS and sinusitis. The aim of this study was to delineate the role of concha bullosa in the aetiology of DNS and sinusitis.

MATERIAL AND METHODS

The present retrospective study was conducted in the Department of ENT And HNS, SMGS Hospital Jammu after approval Institutional Ethics Committee. CT scans of nose and paranasal sinuses of 235 patients done from March 2022 to November 2022 were studied and analyzed for the existence of concha bullosa and coexistent and DNS and sinusitis.

Inclusion criteria:

- 1) CT scans of Nose and Paranasal sinuses of the patients who presented with rhinology complaints.
- 2) CT PNS showing the presence of concha bullosa with or without concomitant DNS and/or sinusitis.

Exclusion:

- 1) CT PNS which did not reveal a concha bullosa.
- 2) CT PNS of patients with history of previous trauma to nose
- 3) CT PNS of patients with other nasal pathologies viz Antrochoanal polyp, Nasopharyngeal Angiofibroma, Nasopharyngeal carcinoma, Inverted papilloma etc.

CT scans were found to have unilateral or bilateral and concha bullosa. In a case of a bilateral concha bullosa the bigger concha bullosa was considered to be the dominant one. Any bending of the septum from midline was taken as DNS. Laterality of DNS was defined by the side of convexity of the deviated septum. The presence of air column between the septum and the concha bullosa was noted. Coexistence of concha bullosa and DNS was studied. Paranasal sinuses were analyzed for mucosal disease and its coexistence with the concha bullosa was studied.

All data was entered in MS Excel and relevant statistical tests were done as advised by the statistician. Pearson correlation coefficient was used to calculate the correlation between the presence of concha bullosa and DNS/sinusitis. The values of the coefficient range from -1 to +1 which suggest a negative or a positive

correlation respectively. Coefficient value from 0 to 0.5 suggests a weak correlation, 0.5 to 0.75 suggests a moderate correlation, 0.75 to 1 suggests a strong correlation.

RESULTS

A total of 235 CT scans were studied. The age of the patients ranged from 14 to 68 years. Gender revelation showed a male preponderance (59.5%) with a male:female ratio of 1.47. Among these 235 CT scans, 74 (31.4%) were found to have concha bullosa. Concha bullosa was found to be unilateral in 34 (45.9%) patients and bilateral in 40 (54.1%) patients. The age of the patients ranged from 14 to 68 years. The study showed a male preponderance (60.8%) with male: female ratio of 1.55. Out of 74 patients coexistent DNS was found in 56 (75.7%) patients (fig.1) opposite to the side of unilateral or dominant concha. Now among these 56 patients an air column was present in 43 (76.7%) patients.

Among 74 patients having concha bullosa, sinus disease was present in 48 (64.8%) patients (fig.2).

Figure: 1

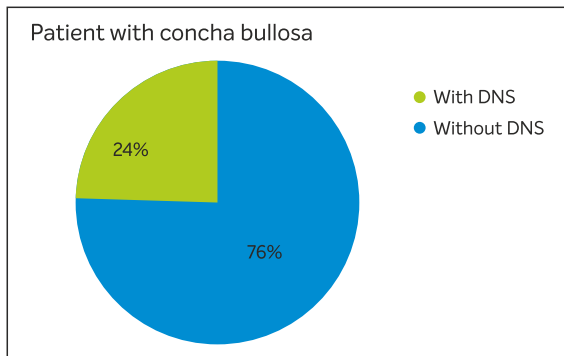
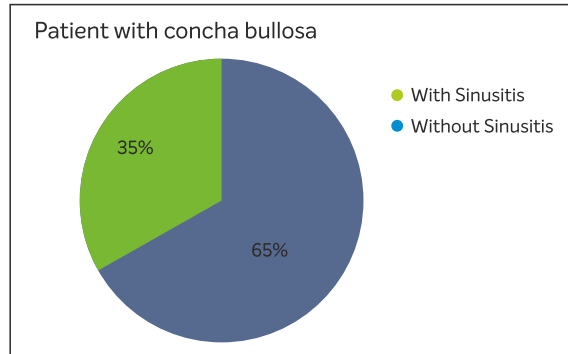


Figure: 2



DISCUSSION

A pneumatized middle turbinate is known as concha bullosa. It can pneumatize at any point of time in one's life. It can pneumatize from either the frontal recess, the agger nasi cell, anterior ethmoid cells or the middle meatus. It may have septations therefore multiple cells within it. Although concha bullosa is not considered as a separate pathology but it can compromise the sinus drainage pathways to produce infective sinuses and cause a deviation of septum to contralateral side. Most of the patients are usually asymptomatic and the diagnosis is usually incidental. Concha bullosa is present in about 14 to 53% of the population. It can be unilateral or bilateral.

In our study, concha bullosa was present in about 31.4% of patients. However the CT scans studied were that of patients rather than the general population. Hence, our findings are purely for symptomatic patients rather than the general population. Our findings were consistent with the study done by Stalman et al and Kumar et al who in the study found the incidence to be 35% and 40.3% respectively.

In our study we found that 75.7% of the patients with concha bullosa had a coexistent DNS towards the opposite side to that of the

unilateral or dominant concha bullosa which is statistically significant (Pearson correlation coefficient “r” = 0.66, positive correlation). However 76.7% of these patients had an air column in between concha bullosa and the septum. This suggests that deviation of the septum is not merely by the push of the concha on the septum but by some developmental interaction between the two which is still unknown.



Figure 4: CT PNS showing the presence of right sided concha bullosa with DNS towards the opposite side.

Some reports have suggested a relationship between the presence of concha bullosa and sinus disease [4, 5], but others have found no direct relationship [6, 7].

We also found that in 64.8% of the patients with concha bullosa, concomitant ipsilateral sinus disease was present. This can be explained from the fact that concha bullosa can cause an obstruction in the sinus drainage pathways leading to chronic infection of the paranasal sinus. (Pearson correlation coef ‘r’ = 0.29)

Figure 3: CT PNS showing the presence of bilateral concha bullosa with mucosal enhancement of bilateral maxillary sinuses.



CONCLUSION

Concha bullosa is a common anatomical variant of middle turbinate which can occur unilaterally or bilaterally. There is a strong relationship between the concha bullosa and the DNS towards the contralateral side. However the presence of air column between the concha bullosa and the septum may exclude its role in the development of DNS. Incidence of ipsilateral sinusitis was high in the patients with concha bullosa. Hence, concha bullosa can also predispose sinusitis.

DECLARATION

Ethics approval and consent to participate: The study was approved by Organizational Ethics committee.

Conflict of Interests: The authors declare that there are no conflicts of interest.

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