

Study of relationship of concha bullosa to nasal septal deviation and sinusitis

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Abstract

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

Materials and methods In this retrospective study 419 consecutive CT scans of paranasal sinuses done between October 2005 and September 2007 were serially evaluated for the presence of concha, DNS and sinusitis.

Results Out of 419 CT scans evaluated, concha bullosa was present in 40.3% of patients. Among these, concha co-existent DNS was found in 87.5% , air column between DNS and concha was found in 88.5% and sinus disease was present in 69.2% of patients.

Conclusion Presence of air column between DNS and concha excludes the etiological role of concha in DNS. Concha bullosa may predispose to sinusitis.

Keywords Concha bullosa · Deviated nasal septum (DNS) · Sinusitis · Air column

Introduction

Pneumatization of the middle turbinate is called concha bullosa. It is a fairly common condition affecting approximately 35% of the population. Most of the patients with concha bullosa are asymptomatic and are detected to have the same upon evaluation of headache. Many patients with concha bullosa have been found to have co-existent deviation of the nasal septum and sinusitis. However, in the literature there are very few studies, which correlate concha bullosa with septal deviation and sinusitis. Herein we have done a retrospective analysis of the CT PNS in order to assess the relationship between concha bullosa, deviated nasal septum (DNS) and sinusitis.

Aims of the study

1. To study the etiological role of concha bullosa in nasal septal deviation.
2. To study the relationship between concha bullosa and sinusitis.

Materials and methods

A retrospective clinical study was conducted in the Department of ENT at K. S. Hegde Charitable Hospital, Mangalore. 419 consecutive paranasal sinus CT scans done between October 2005 and September 2007 were being serially evaluated and analyzed. The only inclusion criteria used was the presence of concha bullosa. Concha bullosa was defined as being present when more than 50% of the vertical height (measured from superior to inferior in the coronal plane) of the middle turbinate was pneumatized. The presence of concha bullosa on the CT scan was described as unilateral or bilaterally present. If bilateral concha were present the larger one was designated as the dominant concha. The presence of co-existent DNS was also noted.

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We defined nasal septal deviation as any bending of the nasal septal contour as evaluated on coronal CT studies. The side of the convexity of the curvature defined the direction of the deviation. The preservation or obliteration of the air column between the concha and the DNS was also assessed. The sinuses were assessed for presence of mucosal disease. This disease was graded as 0 - no disease, 1+ - partial sinus opacification and 2+ - complete sinus opacification.

Results

Out of the 419 CT scans evaluated, 169 (40.3%) patients were found to have concha bullosa. 36 (21.3%) patients were in the age group of 1–20 years, 107 (56.3%) patients were in the age group of 21–40 years, 26 (15.3%) patients were in the age group of 41–60 years, 3 (1.7%) patients were in the age group of 61–80 years. The youngest patient in this study was 11 years old and the oldest 68 years old. There were 97 (57.3%) male patients and 72 (42.7%) female patients. Concha bullosa was found to be unilateral in 83 (49.1%) patients and bilateral in 86 (50.9%).

Co-existent DNS was found in 148 (87.5%) patients, deviation being opposite to the side of concha bullosa (unilateral/dominant concha).

Presence of air columns between the concha bullosa and DNS was found in 131 (88.5%) (Figs. 1 and 2).

When considering the relationship of sinus disease and concha bullosa, 55% patients with concha bullosa had partial sinus opacification, 14.2% had complete sinus opacification and 30.8% had no sinus disease.

Discussion

Concha bullosa is defined as pneumatization of the middle turbinate. It originates as the extension of the pneumatization

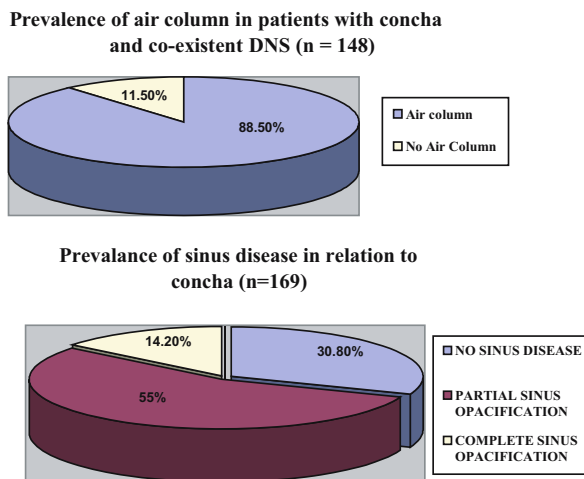


Fig. 1 Prevalence of air column and sinus disease in patients with concha bullosa

from the frontal recess or agar nasi cells. It is a common anatomical variant, which can begin at any age. Most patients with concha bullosa are asymptomatic who do not require any surgical intervention.

The prevalence of concha bullosa ranges from 14–53% [1–3] as assessed on the basis of CT findings. In our study the concha bullosa was present in 40.3% of the patients in comparison with the study conducted by Stallman et al. (35%) [1]. But the population studied was referred for CT scan due to the presence of a specific symptom presumably related to the potential disease in the sinonasal region. Therefore the statistical inference of our results applies only to a symptomatic population. However, no conclusion about the general population is made from the results of this study.

With regard to the nasal septal deviation, there are very few studies, which report the relationship between concha bullosa and nasal septal deviation. In our study we found that 87.5% of the patients with concha bullosa had co-existent nasal septal deviation to the contralateral side, which is statistically significant (with most patients having concha bullosa on the roomier side). In that group 88.5% patients had maintenance of the nasal air channel between the medial aspect of the concha (unilateral/dominant concha) and the adjacent surface of the nasal septum. This implies that the deviation of the septum away from the concha is not the result of concha pushing the septum. The exact developmental relationship between the two still appears to be unknown.



Fig. 2 CT scan of PNS showing deviated nasal septum to right, concha bullosa on the left side and an air column between the concha bullosa and the nasal septum

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 have found a correlation between the presence of concha and ipsilateral sinus disease. 69.2% of patients with concha had CT evidence of sinus disease. But there was no evidence sinus disease on the contralateral side.

Conclusions

Concha bullosa is a common anatomical variant detected in the general population. It may occur unilaterally or bilaterally and may or may not be symptomatic. There is a strong association between concha bullosa and DNS wherein the deviation was seen away from the concha. But the presence of air column between the concha and deviated septum excludes the role of concha in the development of DNS. Incidence of sinusitis was found to be high on the side of concha bullosa. Hence, it concluded that presence of concha bullosa could predispose to sinus disease.

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