

## A Study on the Incidence of DNS and Chronic Rhinosinusitis in Patients with Concha Bullosa

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### Abstract

**Aims:** To study the association of concha bullosa with deviated nasal septum and chronic rhinosinusitis.

**Materials and Methods:** A cross sectional study was carried out on 70 Patients with concha bullosa who attended the Dept of ENT at GSL Medical College and general hospital Rajamahendravaram.

**Results:** Out of 70 patients with concha bullosa 64 i.e 91.4 % had DNS to the contralateral side and 40 patients i.e 57.1 % had sinus disease. Out of 70 patients, 48(69%) were males and 22 (31%) were females with male female ratio being 2:1.

**Conclusion:** It is concluded that there is a significant association between concha bullosa and a contralateral deviated nasal septum and that concha bullosa does play a role in the development of chronic rhinosinusitis though not all the patients with concha bullosa have sinus disease.

**Keywords:** concha bullosa, Chronic rhino sinusitis, Deviated nasal septum (DNS).

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### Introduction

Chronic rhino sinusitis (CRS) is one of the most common illnesses of our times and is a condition that is increasing in epidemic proportions throughout the world. Chronic rhinosinusitis is a common clinical syndrome characterized by symptomatic inflammation of the nose and paranasal sinuses mucosa, present for 12 or more weeks duration. [1] The swollen mucosal lining may also interfere with drainage of mucus. Certain anatomical variations of lateral wall of nose like concha bullosa, nasal septal deviation, oversized ethmoidal bulla etc are considered important as they may contribute in blockage of osteomeatal complex, ventilation and drainage of paranasal sinuses. Preoperative evaluation of these variants is also important being a part of surgical safety. The presence of anatomical variations have been studied in great detail by many authors in different populations, but their relationship with CRS is under debate. Most common variations being either DNS or concha bullosa. Its role in pathogenicity and chronicity of CRS warrants further detailed study. CT demonstrates the extent of disease,

significant anatomical variations that may predispose to rhinosinusitis and the nearby vital structures so that iatrogenic damage can be avoided. The deviated nasal septum (DNS) may involve the cartilage or bone or both. [2]

There are varieties of DNS like Anterior dislocation, C- Shaped deformity, S- Shaped deformity, Spur or Thickening (may be due to localized hepatoma or overriding of displaced fragments).

DNS can affect any age and sex. Various symptoms associated with it are nasal obstruction, headache, facial pain, epistaxis, anosmia, external deformity and middle ear infections.

The main aim of this study was to find the relationship of Concha bullosa with DNS and Chronic rhinosinusitis in our region and their clinical significance and to find out whether a probable relationship exists between them or not. We study association of concha bullosa with deviated nasal septum and chronic rhinosinusitis.

**Materials and Methods**

A cross sectional study was carried out in the Department of Otorhinolaryngology at GSL Medical College and General Hospital, Rajamahendravaram from December 2022 to October 2023. Patients who were clinically symptomatic attending to the opd were evaluated with the help of nasal endoscopy and CT scan of para nasal sinuses. 70 patients who were identified with concha bullosa and those who satisfied the inclusion and exclusion criteria within the study period were included in the study

**Inclusion Criteria**

Both men and women of age  $\leq 70$  years with symptoms of nasal obstruction or symptoms of chronic rhinosinusitis (nasal obstruction, headache, facial pain or pressure, nasal discharge, reduction or loss of smell) for more than 12 wks who were found to have concha bullosa on CT PNS and Diagnostic nasal endoscopy. Concha bullosa refers to pneumatization of the middle turbinate. Concha bullosa with more than 50 percent pneumatization of the vertical height (measured from superior to

inferior in the coronal plane on CT) was taken into consideration.

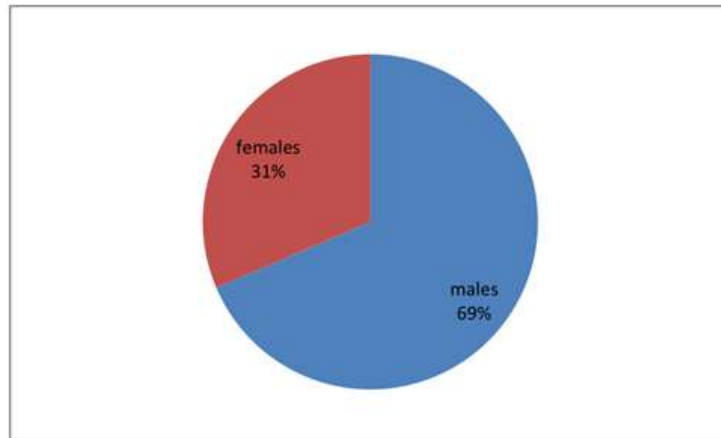
**Exclusion Criteria**

1. Patients with Nasal polyps
2. Tumours
3. Allergic fungal rhinosinusitis
4. Individuals with mucociliary problems and immunocompromised state
5. Individuals with h/o previous nasalsurgeries
6. Allergic rhinitis

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. All statistical analysis was done by using MS excel 2019. Descriptive data was presented as proportions and percentages. Data was also tabulated and graphically represented.

**Results**

A total of 70 patients with concha bullosa were examined.



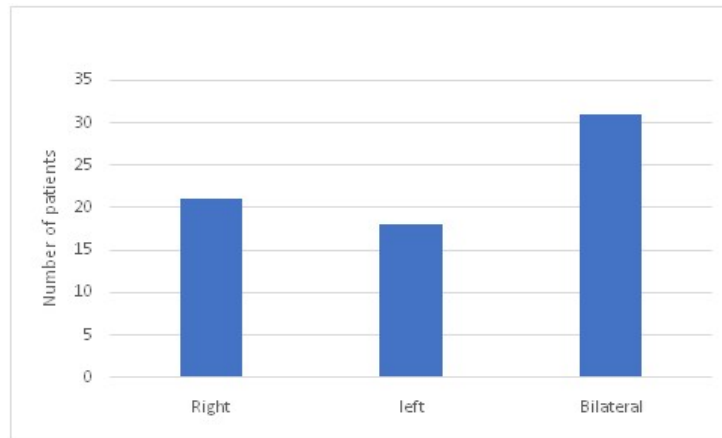
**Figure 1: Distribution of cases in genders**

Out of 70 patients, 48(69%) were males and 22 (31%) were females with male female ratio being 2:1.

**Table 1: Distribution of cases in study with age groups**

Age group in intervals	Number of cases	Percentages
1–20 years	15	21.4
21-40 years	39	55.7
41-60 years	11	15.7
>60 years	5	7.2

15 (21.4%) patients were in the age group of 1–20 years, 39 (55.7%) patients were in the age group of 21–40 years, 11 (15.7%) patients were in the age group of 41–60 years, 5 (7.2%) patients were in the age group of >60 years. The youngest patient in this study was 12 years old and the oldest 65 years old. The maximum number of patients were seen in age group 21–30 followed by age group 10–20 years, and least in age group > 60 years.



**Figure 2: Laterality of concha bullosa in present study**

Out of 70, 39 (55.71%) had unilateral and 31 had bilateral concha bullosa(44.28%) . 21 out of 39 (53.84%) had on right and 18 out of 39(46.15%) had on left .There was no significant difference noted in the laterality of the concha.

**Table 2: Distribution DNS and Sinusitis among Cases**

Total (70 cases)	DNS			Sinus disease			
	Right	Left	Total	Right	Left	Bilateral	Total
	Number of cases(%)	Number of cases(%)	Number of cases(%)	Number of cases(%)	Number of cases(%)	Number of cases(%)	Number of cases(%)
Females (22)	8(36.3%)	13(59%)	21(95.4%)	6(27.7%)	4(18.1%)	6(27.7%)	16(72.7%)
Males (48)	19(52%)	25(52%)	42(89.5%)	5(10.4%)	10(20.8%)	8(16.6%)	24(50%)
Total	27(38.5%)	37(52.8%)	64(91.4%)	11(15.7%)	14(20%)	14(20%)	40(57.1%)

64 patients out of 70 patients with concha bullosa i.e 91.4 %had DNS to the contralateral side, 40 out of 70 patients with concha bullosa i.e. 57.1% had sinus disease.Out of 22 female cases, 8 (36.3%) were having DNS on Rt side and 13 (59%) on Lt side; 6 (27.7%) cases were having sinus disease on Rt side, 4 (18.1%) on Lt side and 6 (27.7%) had bilaterally sinus disease. Out of 48 male cases, 19 (52%)were having DNS on Rt side and 25(52%) on Lt side; 5 (10.4%) cases were having sinus disease on Rt side, 10 (20.8%) on Lt side and 8 (16.6%) had sinus disease bilaterally.

38.5% of the total cases taken were having right side DNS and 52.8% was having left side DNS. Concha bullosa, was bilateral in 44.28% cases, 30% on right side and 25.7% on left side of sino-nasal cavity. There were no significant differences in laterality. Of the sinuses ,maxillary sinus was the most frequently involved ( about 87%)followed by anterior ethmoid s(75%) with sphenoid sinuses being the least commonly involved.

**Discussion**

The prevalence of concha bullosa ranges from14–53% as assessed on the basis of CT findings and is

a common anatomic variant seen. [3]Nasal septum is fundamental in the development of the nose and paranasal sinuses. It is the epiphyseal platform for the development of the facial skeleton. The reported prevalence of DNS varies widely. It is the most common anatomical variant seen.[4]

In our study, out of 70 patients, 48(69%) were males and 22 (31%) were females with male female ratio being 2:1. El-Din WAN et al [5]study males were more affected by sinusitis than females, InEl-Taher M et al[6]study concha bullosa was significantly more in females (68.6%) compared to males , but in our study CB is more common in male cases than female.

In present study maximum number of patients were seen in age group 21–40 with 39 (55.7%) patients, followed by age group 10–20 years which correlates with study done by Satheesh Kumar Bhandary et al[7]where 107 (56.3%) patients were in the age group 1–40 years.

64 patients out of 70 patients with concha bullosa i.e 91.4 %had DNS to the contralateral side, 40 out of 70 patients with concha bullosa i.e.57.1% had sinus disease. The prevalence of concha bullosa

varies from 5 to 53% as per various studies. Lothrop HA[8] noted middle turbinate pneumatization in 9% of the 1000 lateral nasal specimens examined. As per Turner AL[9] it was in 20% , Bolger WE et al[10] found the incidence to be 53.6% and Maru YK et al[11] found it out to be 41.3% while only 15% as found out by Bharathi MB et al [12]. Bogler WE et al[10] divided middle turbinate pneumatization into three types, bulbous type: pneumatization of bulbous segment of middle turbinate, lamellar type: pneumatization of vertical lamella of middle turbinate and extensive type: pneumatization of vertical and bulbous portion. Calhoun Kh et al[13] stated that concha bullosa was found more frequently in the symptomatic group of patients with sinusitis , Zinreich SJ et al [14] showed that concha bullosa is often associated with ostiomeatal complex disease . Yousem DM et al [15] remarked “it appears that the size not just the presence of concha bullosa and another anatomic variant is the critical factor”. A large size concha bullosa impinges directly on OMC and can predispose to maxillary sinus ostium obstruction and subsequently chronic rhinosinusitis. In our study 40 out of 70 patients with concha bullosa i.e. 57.1% had sinus disease.

In our study 38.5% of the total cases taken was having right side DNS and 52.8% was having left side DNS. 91.4 %had DNS to the contralateral side of concha. Concha bullosa was bilateral in 44.28% of cases, 30% on right side and 25.7% on left side of sino-nasal cavity. There were no significant differences in laterality. With regard to the nasal septal deviation, there are very few studies, which report the relationship between concha bullosa and nasal septal deviation. The deviation of the septum away from the concha is not yet considered the result of concha pushing the septum. The exact developmental relationship between the two still appears to be unknown.

### Conclusion

In our study based on the results it was found that there is a significant association between concha bullosa and a contralateral deviated nasal septum.

With more than 50 % of patients with concha bullosa having chronic rhinosinusitis it is concluded that concha bullosa does play a role in the development of chronic rhinosinusitis though not all the patients with concha bullosa have sinus disease. These anatomical variations can be used as a tool for early prediction of chronic rhino sinusitis and hence substantiates the need for regular follow up, proper medical management and life style modification to counteract this disease at its nascent stage. A more descriptive study is warranted for further understanding of the role of these variations in etiopathogenesis of chronic rhino sinusitis.

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