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ENT

KEY WORDS: Concha bullosa, Middle turbinate, Deviated Nasal Septum, Pneumatization

A STUDY ON ASSOCIATION BETWEEN CONCHA BULLOSA AND DEVIATED NASAL SEPTUM

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ABSTRACT

Background: Concha bullosa is the most common sino-nasal anatomical variation and middle turbinate is the most common site. Exact cause of concha bullosa development is not known.
Objectives: To analyse the incidence of concha bullosa and its correlation with nasal septal deviation.
Methods: A prospective study including 60 patients with deviated nasal septum. Paranasal sinus computerised tomography (CT) scans were obtained and were analysed to detect the presence of concha bullosa and its laterality.
Results: The study included 60 patients with deviated nasal septum. 21 (35%) cases had concha bullosa with 81% unilateral and 19% bilateral concha bullosa. There was a clear link between the presence of a unilateral concha, or a dominant concha (in bilateral concha), and the presence of nasal septal deviation (P<0.05).
Conclusions: We found a statistically significant relationship between concha bullosa and the contralateral nasal septal deviation and suggest that septal deviation is an indirect result of the presence of the concha bullosa.

INTRODUCTION

Concha bullosa (CB)—that is, pneumatization of the any turbinate is the most common variant of the sino-nasal complex with middle turbinate being the most common site [1,2]. According to the literature, the incidence of CB in the adults ranges widely from 13 to 53.6% [3-5]. Pneumatization of the middle turbinate is defined as CB regardless of the amount and location of the air [6] and the cause of the pneumatization is not known [2].

Deviated Nasal septum is another pathology of the nasal cavity that is common in the general population, with a reported prevalence of 18 to 57% [6,7]. Among its causes are trauma, developmental defects, congenital deformities, growth anomalies of facial structures, finger sucking, applying pressure with the tongue to the palate, and breathing through the mouth. Trauma may damage the vomer and maxillary crest, especially if it occurs before the complete ossification of these structures [8]. The incidence of deviated nasal septum is lower in neonates than in adults. Moreover, in neonates, accompanying CB is not seen. However, with increasing age, the incidence of deviated nasal septum increases and the CB becomes apparent after the age of 7 years [2] The aim of this prospective study was to investigate the incidence of concha bullosa and its correlation with deviated nasal septum.

MATERIALS AND METHODS

This prospective study included 60 patients with nasal symptoms due to deviated nasal septum who were admitted for surgical management in the Department of Otorhinolaryngology and Head and Neck Surgery (ENT) Government Medical College Jammu J and K from October 2019 to September 2020. All patients were subjected to the following; full history taking, ENT examination and endoscopic nasal examination, Computed tomography (CT) of nose and paranasal sinuses, and surgical management. 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 unilaterally or bilaterally present. If bilateral concha bullosa were present the larger one was designated as the dominant concha. The presence of co-existent Deviated nasal septum was also noted.

Data was analysed statistically using statistical package for social sciences (SPSS-IBM, version 23). Chi square test was used wherever required.

RESULTS

This study included 60 patients with nasal symptoms due to deviated septum. The mean age of the patients was 35.3 years (range 16-75). Of these patients 25 were male (41.6%) and 35 female (58.3%) patients. Of the 60 patients, 40 (66.6%) had convexity to the right, 15 (25%) had convexity to the left, and 5 (8.3%) had biconvex nasal septal deviation. The middle turbinate is located roughly adjacent to the middle part of the septum.

Concha bullosa was found in 21 (35%) cases, of which 4 (19%) were bilateral and 17 (81%) unilateral Figure 1(A), (B) and (C). Of the 17 patients, nine cases had concha bullosa on the right side, and eight cases had concha bullosa on the left side. Of the 25 conchae (21 patients), 8 were large (in 7 patients), 5 were moderate (in 4 patients), and 12 were small (in 10 patients).

The correlation between a unilateral or dominant concha and contralateral nasal septal deviation was significant (P<0.05). In patients with a unilateral or dominant concha bullosa and deviated nasal septum, the association of septal deviation was greater in patients with medium or large concha bullosa than in those with small concha. Septal deviation was found in 39 cases without aeration of the middle turbinate. A complete air channel between the medial aspect of the concha and the adjacent surface of the nasal septum was detected in 16 cases with concha bullosa.

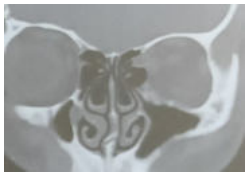

Figure 1(A): Bilateral concha bullosa with dominant concha on right side with septal deviation towards left side.

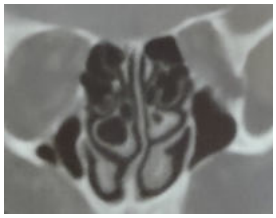

Figure 1 (B): Unilateral concha bullosa on right side with septal deviation towards left side.

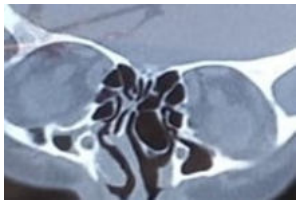

Figure 1 (C): Unilateral concha bullosa on left side with septal deviation towards right side.

DISCUSSION

The incidence of concha bullosa varies between 13% to 53.6% in adults [3-5] and 5% to 10% in children [9]. There are two discrete hypotheses related to the development of concha bullosa as proposed by Stammberger[10]. The first one suggests that first, unfilled space "e vacuo" provokes the development of concha bullosa after the deviation of nasal septum, that is, septal deviation is responsible for the development of concha bullosa. The second one suggests that septal deviation and concha bullosa are two anatomic variants found incidentally and concomitantly. However, not all people with deviated nasal septum necessarily have concha bullosa (39 cases in this study), while almost all cases with dominant or large concha bullosa definitely have deviated nasal septum. The airflow through the different parts of nose depends on length and cross-sectional area of the airway and the pressure gradient across the nose. The expansion of the concha bullosa gradually reduces the space between middle turbinate and the nasal septum and the increase in the obstruction results in a corresponding increase in the pressure required to generate certain flow. More pressure will be exerted on the nasal septum, which will gradually deviate.

In a study in 2008, the coexistence of deviated nasal septum and concha bullosa was seen in 44% of the population series [11]. In our study, the incidence of concha bullosa was 35% with 81% unilateral and 19% bilateral.

The incidence of bilateral concha bullosa was reported to be between 45% and 61.5% [2] which is contradictory to our study. In our study, bilateral concha bullosa was found in 19% cases and unilateral concha bullosa in 81% cases with deviated nasal septum.

CONCLUSION:

we found that there is a strong relationship between the presence of unilateral or dominant concha bullosa and contralateral deviated nasal septum.

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