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Original Research Article

The degree of concha bullosa pneumatization and its association with severity of deviated nasal septum in patients of southern region in Saudi Arabia

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ABSTRACT

Background: To determine the degree of concha bullosa pneumatization and its association with deviated nasal septum in patients of southern region in Saudi Arabia.
Methods: This study used a retrospective radiological design to analyze computed tomography scans of 117 patients aged between 18 and 80 years of southern region in Saudi Arabia were used in this study. Patients with altered anatomy (iatrogenic or pathological) were excluded, CT scans were analysed to determine. The degree of concha bullosa and its association with deviated nasal septum in patients of southern region in Saudi Arabia, and the correlation between them.
Results: Forty percent (40%) cases were male and sixty percent (60%) were female. Concha bullosa (CB) were found in 17(14.5%) cases, of which 4 cases (23%) were bilateral and 13(76%) were unilateral. 7(53%) of unilateral cases were on right side, 6(47%) on left side. From all CB patients in this sample size, 15 (88%) cases have deviated nasal septum that range from mild to severe type whereas 2(12%) cases have no deviated nasal septum. Only 1 of those patients with severe deviated nasal septum has extensive type of concha bullosa.
Conclusions: Our findings revealed that there is no relationship between degree of pneumatization of CB and severity of deviated nasal septum.

Keywords: Concha bullosa, Computed tomography, Nasal septum

INTRODUCTION

Concha bullosa is defined as pneumatization of middle turbinate.[1] It is one of the nose's most frequently seen anatomical variations. As part of normal pneumatization of ethmoidal air cells, Concha bullosa can be classified into three varieties based on the parts concerned, lamellar: comprising the vertical part of the middle turbine, bulbous: comprising the horizontal part, mixed: comprising the horizontal and vertical part of the middle turbine.[2] The air in a the concha bullosa is lined with the same epithelium as the remainder of the sinonasal tract.[3] The exact turbinate aeration mechanism has not been clarified.[4] It is most commonly found in the middle of the Concha, however, can also be seen in superior or Inferior concha. It might be presenting Unilateral or bilateral, very tiny or perhaps very small Achieving a significant size.[5] Nowadays, paranasal computed tomography (CT) simple tool for diagnosing pathologies. It therefore provides an accurate and reliable preoperative procedure for Endoscopic Sinus Surgeon Roadmap.[6] In general, CB is asymptomatic and is incidentally diagnosed by CT. An over-pneumatized one, sometimes, Nasal obstruction, contact headache, deviated septum, and chronic sinusitis.[7]

Understanding the CB's anatomical variations makes it possible for appropriate management to be planned.[7]

Facial pain or headache can be presented, proper diagnosis and the choice of patients is very important to achieve good results with CB surgery.[8]

In order to develop recovery plans during the procedure and to avoid potential complications, paranasal anatomy should be exposed in depth prior to ESS. During radiological and endoscopic examination of the paranasal sinus anatomy, attention should be given to these variations.[9]

In the population, nasal septal deviation is strongly accounted In the literature, it is recorded between 18.8-57.6 percent.[10] Trauma, especially from infancy and childhood injuries, is an important factor in the etiology of septal deformity.[11] While trauma, nasal septal deviation (NSD) and mouth breathing have been identified as predisposing factors for CB, the causes of pneumatization remain unknown.

The aim of this study was to demonstrate the degree of CB and its association with deviated nasal septum in patients of southern region in Saudi Arabia.

METHODS

After getting approval from IRB, This Retrospective study consists of 117 patients aged between 18 and 80 years including both sexes, who were referred for Paranasal sinuses CT scan from the department of otorhinolaryngology at Aseer central hospital. The data was collected during the period between January 2018 and January 2020. Th CT scans were analysed Using both the soft part window and the bony density window, the images were obtained in coronal and axial sections with a 3 mm thickness, to determine the degree of CB and its association with deviated nasal septum in patients of southern region in Saudi Arabia.

Inclusion criteria

The patients with nasal obstruction, DNS and nasal polyposis.

Exclusion criteria

The patients with cystic fibrosis, immune deficiency, malignancy, metabolic disease, pregnant women and younger man than 18 years were excluded from the study.

Sampling technique and statistical analysis

All CT scan of patients recorded regarding their DNS and CB. All statistical analyses were performed using SPSS for Windows software (ver. 18.0; SPSS, Inc., Chicago, IL, USA). The significance of associations was tested using chi-square or Fischer exact tests. P-values<0.05 were considered to indicate statistical significance.

RESULTS

Forty percent (40 %) cases were male and sixty percent (60 %) were female. CB were found in 17(14.5 %) cases, of which 4 cases (23%) were bilateral and 13(76%) were unilateral. 7(53%) of unilateral cases were on right side, 6(47%) on left side. Extensive type of concha found as 23% of unilateral type and 5.8% of bilateral type. From all CB patients in this sample size, 15 (88%) cases have deviated nasal septum that range from mild to severe type whereas 2(12%) cases have no deviated nasal septum. Only 1 of those patients with severe deviated nasal septum has extensive type of CB.

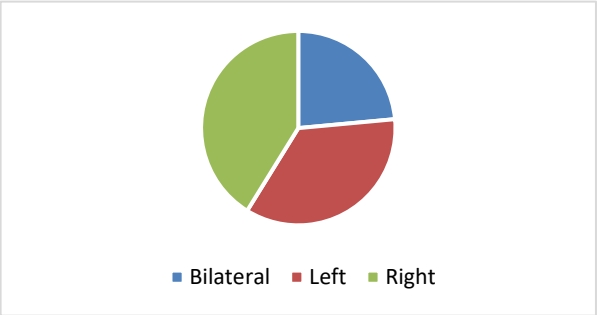

Figure 1: Distribution of CB depending on side.

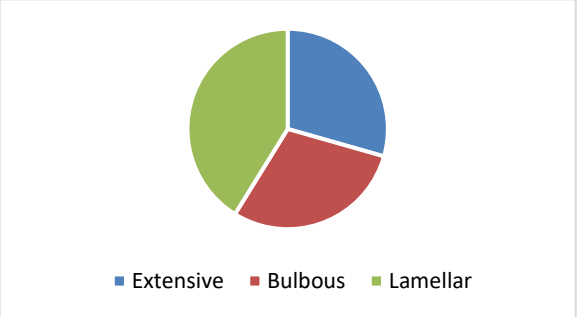

Figure 2: Distribution of CB depending on types.

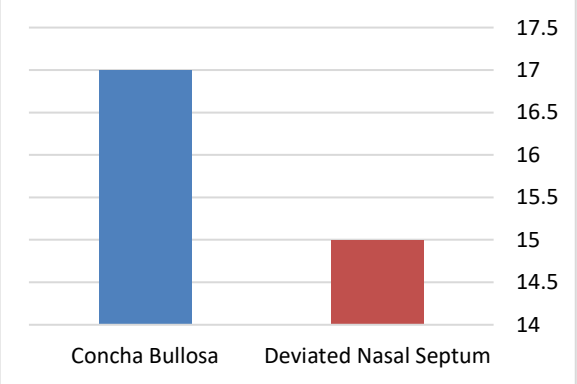

Figure 3: Number of patients with CB and DNS.

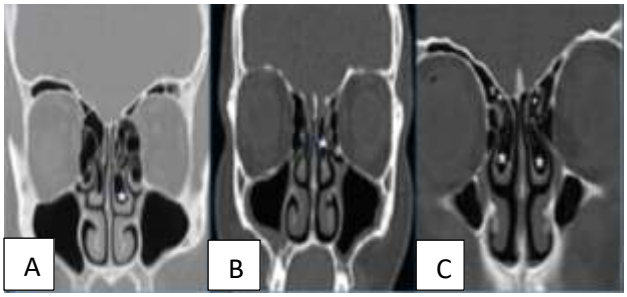

Figure 4: Types of CB (bulbous, lamellar, extensive).

DISCUSSION

The incidence of nasal SD and CB coexisting is high.[12] While some research specifically stated that nasal SD was the most common pathology associated with CB, published studies appeared to focus on the relationship between nasal SD and/or CB and sinonasal anatomical variants. There are only two studies in the literature that describe the incidence and association relationships between CB and SD.[13,14]

CB can be found in people of all ages, which is most likely due to its embryological origins in the formation of ethmoidal air cells. Its later manifestations are most likely the result of the combined effects of other factors such as the climate, allergies, trauma, and so on. CB is better diagnosed radiographically because it is easy to spot on a CT scan as an air space surrounding the middle turbinate.[15]

NSD and CB can have physical effects on each other, according to Erkan et al. Few studies have investigated the association between NSD and the presence of middle turbinate pneumatization in the literature; however, one study found a highly significant connection between the presence of middle CB and a deviated septum on the contralateral side.[16]

It's been proposed that the concave portion of the nasal septum creates an irregular space in the nasal septum that allows the middle turbinate to pneumatize.[17] NSD was often accompanied by a broad dominant CB.[17] "*The degree of pneumatization varies and can cause obstruction of the middle meatus or infundibulum*," Miranda et al suggested.[18] "*The NSD angle plays an important role in the pneumatization of the concha on the opposite side*." Uygur et al suggested.[19]

Limitations of the study was it was based only on 117 patients.

CONCLUSION

Our findings revealed that there is no relationship between degree of pneumatization of CB and severity of deviated nasal septum and degree of pneumatization more in unilateral than bilateral type.

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