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.
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REFERENCES

1. Tomblinson CM, Cheng MR, Lal D, Hoxworth JM. The Impact of Middle Turbinate Concha Bullosa on the Severity of Inferior Turbinate Hypertrophy in Patients with a Deviated Nasal Septum. AJNR Am J Neuroradiol. 2016;37(7):1324-30.
2. Stuck BA, Hummel T. Olfaction in allergic rhinitis: A systematic review. J Allergy Clin Immunol. 2015;136(6):1460-70.
3. Aktas D, Kalcioğlu MT, Kutlu R, Ozturan O, Oncel S. The relationship between the concha bullosa, nasal septal deviation and sinusitis. Rhinology. 2003 Jun;41(2):103-6.
4. Kim WJ, Terada N, Nomura T, Takahashi R, Lee SD, Park JH, et al. Effect of formaldehyde on the expression of adhesion molecules in nasal microvascular endothelial cells: the role of formaldehyde in the pathogenesis of sick building syndrome. Clin Exp Allergy. 2002;32(2):287-95.
5. Prasad S, Aholawat B, Kumar A, Naik SM, Agrawal A, Nagvanshi A. Concha Bullosa and Its Association with Chronic Sinusitis. IOSR J Dent Med Sci. 2015;25(4):527-48.
6. Rak KM, Newell JD, Yakes WF, Damiano MA, Luethke JM. Paranasal sinuses on MR images of the brain: significance of mucosal thickening. AJR Am J Roentgenol. 1991;156(2):381-4.
7. Maraghy A, Allah A, Yonis MAAM, Sharkawy MA, Zewail AGEE. Comparison between lateral partial turbinectomy and conchoplasty for concha bullosa. Egypt J Hosp Med. 2018;73(3):6348-53.
8. Unlü HH, Akyar S, Caylan R, Naçta Y. Concha bullosa. J Otolaryngol. 1994;23(1):23-7.
9. Blaugrund SM. Nasal obstruction. The nasal septum and concha bullosa. Otolaryngol Clin North Am. 1989 Apr;22(2):291-306.
10. Donn SM, Faix RG. Long-term prognosis for the infant with severe birth trauma. Clin Perinatol. 1983;10(2):507-20.
11. Kucybała I, Janik KA, Ciuk S, Storman D, Urbanik A. Nasal Septal Deviation and Concha Bullosa - Do They Have an Impact on Maxillary Sinus Volumes and Prevalence of Maxillary Sinusitis? Pol J Radiol. 2017;82:126-33.
13. Stallman JS, Lobo JN, Som PM. The incidence of concha bullosa and its relationship to nasal septal deviation and paranasal sinus disease. AJNR Am J Neuroradiol. 2004;25(9):1613-8.
14. Li L, Zang H, Han D, Ramanathan M, Carrau RL, London NR. Impact of a Concha Bullosa on Nasal Airflow Characteristics in the Setting of Nasal Septal Deviation: A Computational Fluid Dynamics Analysis. Am J Rhinol Allergy. 2020;34(4):456-62.
15. Sarna A, Hayman LA, Laine FJ, Taber KH. Coronal imaging of the osteomeatal unit: anatomy of 24 variants. J Comput Assist Tomogr. 2002;26(1):153-7.
16. Kapusuz GZ, Ozkırış M, Okur A, Karaçavuş S, Saydam L. The effect of nasal septal deviation on maxillary sinus volumes and development of maxillary sinusitis. Eur Arch Otorhinolaryngol. 2013;270(12):3069-73.
17. Sazgar AA, Massah J, Sadeghi M, Bagheri A, Rasool E. The incidence of concha bullosa and the correlation with nasal septal deviation. B-ENT. 2008;4(2):87-91.
18. Miranda CMNR, Maranhão CPM, Arraes FMNR. Anatomical variations of paranasal sinuses at multislice computed tomography: what to look for. Radiol Bras. 2011;44(4):256-62.
19. Uygur K, Tüz M, Doğru H. The correlation between septal deviation and concha bullosa. Otolaryngol Head Neck Surg. 2003;129(1):33-6.

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