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ENT

KEY WORDS: Chronic rhinosinusitis, Anatomical variations, Paranasal sinuses

STUDY OF ANATOMICAL VARIATIONS OF NOSE AND PARANASAL SINUSES INFLUENCING THE DEVELOPMENT OF RHINOSINUSITIS

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ABSTRACT

The present study was conducted on 110 patients of chronic rhinosinusitis. The incidence of anatomical variations in sinonasal area by Computerised tomography (CT) scan of paranasal sinuses was analysed along with clinical correlation ofthe extent of disease. The anatomical variations encountered were, deviated nasal septum (74.5 %), agger nasi (69 %), concha bullosa (43.6 %) and pneumatized bulla ethmoidalis(27.2%). The study emphasized the importance of a careful evaluation of CT imaging in patients with symptoms of chronic rhinosinusitis.

INTRODUCTION

Chronic rhinosinusitis (CRS) is a spectrum of inflammatory and infectious disease, which simultaneously affects the mucous membrane of nose and paranasal sinuses (PNS). It is one of the most common disorders and imparts a significant financial burden to the country [1]. To understand the pathophysiology of the disease, it is necessary to have a significant knowledge of the normal anatomy and physiology of the nose and PNS. An anatomical variation may be the sole responsible factor by simply blocking the normal drainage of the PNS. The main physiological protective mechanism of this system is a functional mucociliary transport system. Any derangement of this transport system leads to stasis of mucus and infection or inflammation. The ostiomeatal complex is the key area for the pathogenesis of CRS. The most common way of detection and documentation of anatomical variation can be effectively done by CT scan [2].

OBJECTIVE:

The present study aims to correlate the various anatomical variations in the nose and PNS with its effect in the development of CRS.

MATERIALS AND METHODS

The present study was carried out on 110 patients suffering from CRS in the department of E.N.T., Institute of Medical Sciences & SUM Hospital, Bhubaneswar, Odisha from February 2017 to September 2017. Patients having acute episodes of rhinosinusitis, children less than 15 years of age, age more than 60 years, pregnant women and persons having other chronic disorders were excluded from the study. After thorough explanation regarding the study, consent was obtained from the patients. All the patients were advised for non-contrast coronal and axial CT scan of nose and PNS followed by documentation of records.

OBSERVATION

A total of 110 patients were included in the present study. Males (62%) were more commonly affected with CRS than females (38%) (Fig-1). Most of the patients (56.3%) were found in age group of 15-30 years (Fig-2). Anterior nasal discharge was the most common symptom occurring in 78.2% of patients followed by sneezing (72.7%), headache (70%), post nasal drip (58.2%), and nasal obstruction (38.2)(Fig-3). The most common anatomical variation was deviated nasal septum (DNS), seen in 82 (74.5%) patients. Agger nasi was found in 76 (69%) patients. Concha bullosa was present in 48 (43.6 %) patients. Well pneumatized bulla ethmoidalis was found in 30 (27.2%) patients. Paradoxical curvature of middle turbinate was seen in 12 (10.9%) patients. Haller's cell was seen in 8 (7.2 %) patients. (Fig- 4)

Fig-1: Sex distribution of patients with CRS

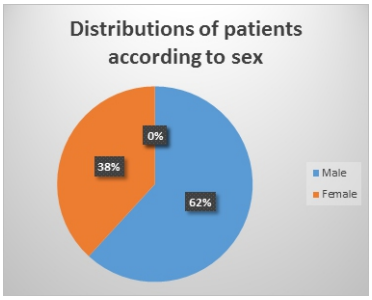


Fig-2: Age distribution of patients with CRS

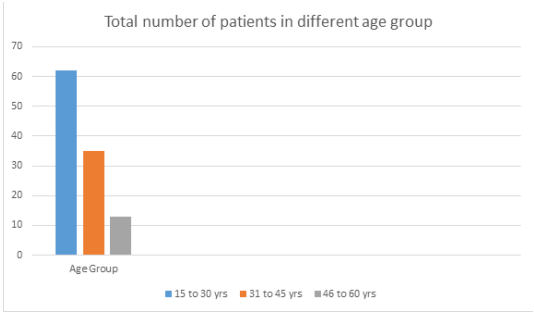


Fig-3: Symptoms of patients with CRS

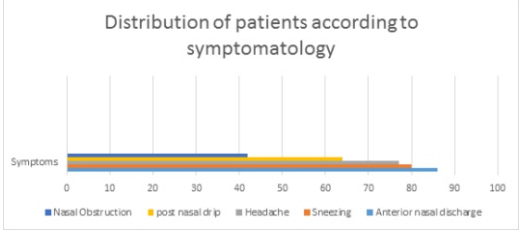
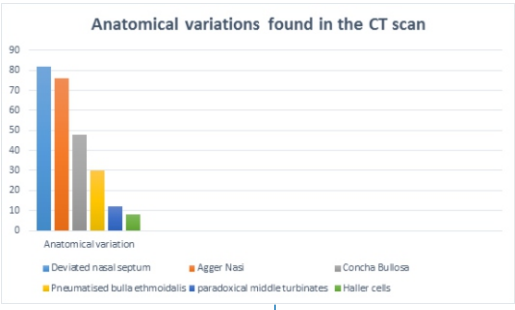


Fig-4: Anatomical variations detected by CT scan PNS



DISCUSSION

CT scan which accurately provided all the detailed bony and soft tissue anatomy of the PNS, is the single most important investigation advised in all most all the CRS cases. In contrast to standard radiographs, CT scan clearly shows the fine bony anatomy of the ostiomeatal complex. It also identifies even minimal anatomic variations and resulting mucosal changes [2]. As per the present study, DNS was the most common anatomic variation, seen in 74.5 % patients. DNS may potentially cause narrowing of the meati and may be responsible for sinusitis in that side. Our study corroborates with a study, in which DNS was encountered in 65.2 % patients [3]. But this observation was more in comparison to that of other studies, which encountered DNS in 55.7 % [4], 44 % [5] and 19.5% [6] patients. In the present study, Agger nasi cell was found in 69 % of patients. They are responsible for narrowing the frontal recess depending upon the pneumatization. The incidence was compared to, studies where it was seen in 68.8% of patients [3] and more than findings of another study (40%) [5]. Concha bullosa was present in 43.6 % of patients. Concha Bullosa is a hypertrophied middle turbinate due to pneumatization which may completely fill the space between the septum and lateral wall resulting in the blockage of the middle meatus. The incidence of concha bullosa in the present study (43.6%) was comparable to a study where it was found in 42.6 % cases [4] and less in comparison to studies where it was seen in to 49.3%[7] and 53.6% cases [8]. Well pneumatised bulla ethmoidalis was present in 27.2% of case. It might be responsible for narrowing of the infundibulum and subsequent development of maxillary sinusitis. Though its accurate incidence was not reported in any of the available literature, as per our study it had a significant contribution for the development of sinusitis. Paradoxical curvature of middle turbinate was seen in 10.9% patients. This anomaly consists of a reversal of the normal outward concavity of middle turbinate and in turn may obstruct the nasal cavity, infundibulum and the middle meatus. This finding was less as compared to studies, where it was seen in 27% [8] and 29.8% [9] cases. Haller's cell was seen in 7.2 % patients. Haller's cells are ethmoid air cells that project beyond the limits of the ethmoid labyrinth into the maxillary sinus. They are considered as infra-orbital ethmoid air cells and may narrow the adjacent ostium of maxillary sinus. It was more in comparison to a study where it was found in 3.62 % cases [3], but less than the finding of another study (36%) [4].

CONCLUSION

Taking into account of the finding of the CT scan, we believe that there is a strong and significant correlation between some anatomic variations and extent of rhinosinusitis. Hence we emphasize the importance of a careful evaluation of CT study in patients with symptoms of CRS. However, it must be kept in mind that sinusitis is not merely an anatomical problem, but an entity that occurs due to infection, superimposed by mucosal and airflow changes within the nasal and paranasal sinus cavities.

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