



EVALUATION OF PREVALANCE AND CHARACTERISTICS OF HALLER'S CELLS ON DIGITAL PANORAMIC RADIOGRAPHS: A RETROSPECTIVE OBSERVATIONAL STUDY

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Abstract: AIMS & OBJECTIVES-: Haller's cells are anatomical variations in the development of paranasal sinuses. Numerous pathologies and symptoms associated with this entity include distressing orofacial pain, sinusitis, nasal obstruction, impaired nasal breathing, headache, chronic cough, and mucocoeles. During endonasal procedures, Haller's cells can restrict access to the maxillary sinus or the anterior ethmoidal cells. So, to avoid the risk of intra-operative complications, the surgeon has to be aware of such variations. The aim was to determine the prevalence and evaluate the characteristics of Haller's cells on digital panoramic radiographs.

MATERIAL & METHODS – This study comprised of 1000 digital panoramic radiographs of healthy adults of the age 18-80 years. Each radiograph was interpreted for the presence of Haller's cells and its characteristics were evaluated. The data collected were then tabulated and subjected to descriptive statistics and chi-square test.

RESULT – Haller's cells were noted in 244 subjects, with a prevalence of 24.4%. Majority of cells were present unilaterally (75.8%) while only (24.2%) were seen bilaterally. Maximum cells were round (42%) & oval (26%) in shape.

CONCLUSION- The overall prevalence of Haller's cells is relatively low and is in harmony with other studies conducted in various geographic populations. Knowledge of Haller's cells while interpreting panoramic radiographs is essential to forewarn surgeons before endonasal procedures, thus preventing any untoward intraoperative complications.

KEYWORDS – Haller cells, panoramic radiograph, Endonasal procedure.

INTRODUCTION- Haller's cells are air cells situated beneath the ethmoid bulla which are seen along the roof of the maxillary sinus and the most inferior portion of the lamina papyracea. [1]. The Swiss anatomist Albert von Haller in 1765 first described Haller's cells, which are also known as maxillo-ethmoidal or orbito-ethmoidal cells. [2] Haller's cells are anatomical variations in the development of the nose and paranasal sinuses. Haller cells are often seen on panoramic radiograph, and many authors have proven their prevalence in their studies. The importance of identifying Haller cells on panoramic radiograph is to rule out the patient's symptoms associated with this anatomical variation. [3] Numerous pathologies and symptoms associated with this entity include distressing orofacial pain, sinusitis, nasal obstruction, impaired nasal breathing, headache, chronic cough, and mucocoeles. [1,2] The clinical significance of this study is that we can consider the

pathologies related to Haller cells in the differential diagnosis in cases where orofacial pain is not responding to the treatment. During endonasal procedures, Haller's cells can restrict access to the maxillary sinus or the anterior ethmoidal cells. So, to avoid the risk of intra-operative complications, the surgeon has to be aware of such variations.[3]The finding could favor the theory of interference of normal mucociliary flow of maxillary sinusitis by Haller cells.[6]A significant increase in maxillary sinus mucosal disorders was observed with large size Haller cells .[7]Haller's cells are seen as well-defined radiolucencies, with different shapes like round, oval, or tear-drop shaped, single or multiple in number, unilocular, or multilocular with a smooth border that may or may not appear corticated.[2]

MATERIAL AND METHOD-The sample was selected by simple random sampling method. This study comprised of 1000 digital panoramic radiographs of healthy adults of the age 18-80 years. Each radiograph was interpreted for the presence of Haller's cells and its characteristics were evaluated.

Inclusion criteria: Patients aged 18 years and above who visited the Department of Oral Medicine, and for whom the panoramic radiograph was advised for their treatment purpose were included in the study and radiographs were not advised for study purpose. **Exclusion criteria:** Patients with a history of trauma and/or surgery involving the maxillofacial region. systemic diseases affecting growth and development. clinical . and/or radiographic evidence of developmental anomalies/pathologies affecting the maxillofacial region were excluded from the study

STUDY DESIGN-In the present study, 1000 OPG were evaluated. The recognition of Haller's cells was made if an anatomical variation fulfilled the criteria suggested by Ahmad et al. The observations pertaining to the Haller's cells were entered in the individuals' proformas. The data collected were tabulated and subjected to statistical analysis to obtain the results. The Chi-square test was performed to analyze any significant difference between groups.



Presence of haller cells in OPG

STATISTICAL ANALYSIS-

Descriptive statistics, Chi-square test was done.

Chi-square test was used to compare the correlation between the various variables and a significant correlation p-value was observed between the prevalence and shape of the haller cells. However, no significant correlation was observed between the gender and shape of the cells.

RESULTS-

Table 1: Prevalence of Haller Cells

	Frequency (n)	Percentage (%)
Present	244	24.4 %
Absent	756	75.6 %
Total	1000	100 %
Chi square test value = 38.9, p<0.001**		

**p<0.001 – highly statistical significance

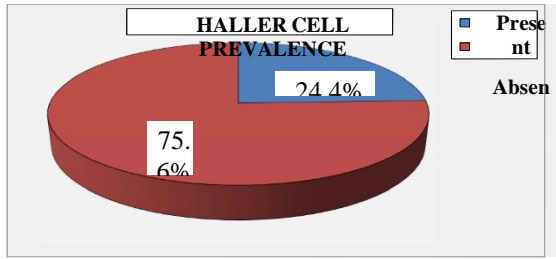


Table 2: Distribution of Haller cells according to side

	Frequency (n)	Percentage (%)
Unilateral	758	75.8%
Bilateral	242	24.2%
Total	1000	100
Chi square test value = 40.4 , p<0.001**		

**p<0.001 – highly statistical significance

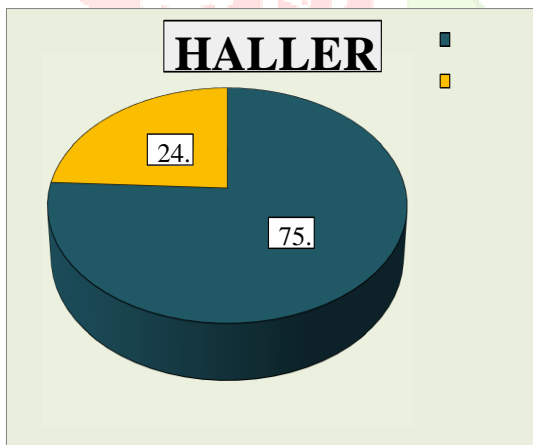
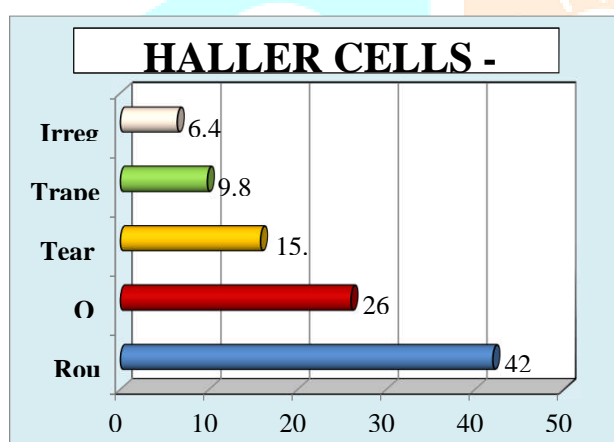


Table 3: Distribution of Haller cells according to shape

	Frequency (n)	Percentage (%)
Round	420	42 %
Oval	260	26 %
Teardrop	158	15.8 %
Trapezoid	98	9.8%
Irregular	64	6.4%
Chi square test value = 16.8 , p=0.002*		

*p<0.05 – statistical significance



Haller's cells were noted in 244 subjects, with a prevalence of 24.4%. Majority of cells were present unilaterally (75.8%) while only (24.2%) were seen bilaterally. Maximum cells were round (42%) & oval (26%) in shape.

DISCUSSION

A wide range of prevalence has been reported in the literature which ranges from 4.7 to 45.1%. [5]. In the present study, the prevalence rate of Haller cells on panoramic radiograph is 24.4% which falls within the range of the previous studies. In this study, the unilateral occurrence of Haller cells was statistically significant. This is in harmony with the previous studies where Haller cells were seen in a larger number of cases unilaterally than bilaterally. In present study, majority of the Haller's cells were round or oval in shape with very few cases depicting a teardrop shape. This is in accordance with previous studies.

LIMITATIONS OF THE STUDY

Larger sample size along with the clinical correlation should be used to clear the confusion whether the sinusitis is because of mechanical obstruction due to Haller cells or infectious process or due to both. 3D imaging modality can be used to detect the Haller cell, so that they should not be missed out, specially in sinusitis.

CONCLUSION

I conclude that the overall prevalence of Haller's cells is relatively low and is in harmony with other studies conducted in various geographic populations. Knowledge of Haller's cells while interpreting panoramic radiographs is essential to forewarn surgeons before endonasal procedures, thus preventing any untoward intraoperative complications.

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