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Case Report

# Zygomatic air cell defect: A case report

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ABSTRACT

Dental panoramic radiograph serves as a radiograph to visualize the maxillae, the mandible and the surrounding structures fairly well. This radiograph depicts the normal anatomy as well as its variations. One among the many anatomical landmarks and their variations noted on this radiograph is the zygomatic air cell defect (ZACD). zygomatic air cell defect is the extension of mastoid air cells into the articular eminence and the zygomatic process of temporal bone, not crossing anteriorly, the zygomatico-temporal suture. This variant of normal anatomy was recognized as early as 1934 but recognition of the same on a dental panoramic radiograph was not until 1985 by Tyndall and Matteson. Following its recognition, a few case reports and systematic studies have been conducted. In spite of its recognition early in the century, not many anatomists, radiologists are aware of this entity and its importance.



## 1. Case report

A 42 year old male patient visited for evaluation of decayed and mobile teeth. The medical and surgical histories were unremarkable. Intra oral examination showed grossly decayed mandibular right first molar tooth with generalized mobility of the teeth. A dental panoramic radiograph was taken which showed grossly decayed mandibular right first molar tooth and generalized resorption of alveolar bone. Incidentally, the panoramic radiograph showed presence of a unilocular, well defined radiolucency with well corticated margins on the right articular eminence of the temperomandibular joint and on the left side a multilocular radiolucency. (Fig. 1) There was no evidence of any expansion and clinically there were no symptoms. Based on the findings, the incidental radiolucencies were diagnosed as zygomatic air cell defect, bilaterally.

## 2. Discussion

The definition of zygomatic air cell defect, as given by park et al is "accessory air cells in the zygomatic process and articular eminence of the temporal bone which appear similar to the mastoid air cells and which does not extend further anteriorly than the zygomatico temporal suture".[1] This definition is appropriate as it gives the description of the entity as well as its extent.

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**Fig. 1 – Panoramic radiograph showing unilocular ZACD on the right side and multilocular ZACD on the left side.**

Zygomatic air cell defect, as a terminology was proposed by Tyndall and Matteson in the year 1987. This entity is also known as Pneumatized Articular Eminence, coined by the same previous investigators in 1985,[2,3] and Pneumatized Articular Tubercle.[3]

Recognition of temporal bone pneumatization date backs to 1934 when Tremble reported the distribution of air cells. Ten locations within the temporal bone were identified that can show pneumatization or the presence of air cells. Among the ten, the zygomatic arch and the articular eminence were also identified.[1]

## 3. Characteristics

Zygomatic air cell defect is recognized solely on its radiographic appearance and clinically they are entirely asymptomatic. ZACD radiographically presents as asymptomatic, non-expansile, non destructive radiolucency. Unilocular variant appears as an oval radiolucent defect with well defined borders and the multilocular type shows numerous small cavities within, resembling mastoid air cells. The trabecular variety is primarily a multilocular variant with internal bony striations.[1,4]

Based on the radiographic appearance of Zygomatic air cell defect, a classification was proposed into three types as 1.) Unilocular type 2.) Multilocular type, 3.) Trabecular type.[1,4]

## 4. Prevalence

A few studies have identified the prevalence of this entity. It varies from the type of investigation as either the Conventional radiograph the panoramic radiograph, Computed Tomogram or Cone beam computed tomogram. Prevalence, when studied using conventional radiographs varies between 1.03% and 3.42%.[5] When CBCT was used to investigate this entity, the prevalence ranged from 6.4% to 8 %.[6,7] This indicates that the chances of visualizing this variant on a commonly employed radiographic investigation are still santy.

## 5. Gender distribution

Zygomatic air cells may be found in both the genders. Some studies have found a female preponderance where as others, a male preponderance where as still others have found an equal gender distribution.[3,8,9]

## 6. Age distribution

ZACDs have been noted in children as young as 7–8 yrs and in adults up to the age of 75 yrs. Hence, they can be recognized in a wide age range.[3,8]

## 7. Types/locularity

Based upon the existing classification, zygomatic air cells can appear radiographically as unilocularity; multilocularity or a trabecular type. Overall the multilocular variant is found to be more prevalent and can appear in combination as well.[4,9,10]

## 8. Laterality

These air cells have been seen both unilaterally and bilaterally. In some studies there is predominance of right side where as in others it's the left side.[8–10]

## 9. Significance

Temporal air spaces, including the zygomatic air cells have been found to be impending pathways for the spread of infections and tumors. Tumors from the mastoid process and ear may further extend into temperomandibular joints, and infections like otitis or mastoiditis may involve temperomandibular joints and can even result in ankylosis. When zygomatic air cells are noted on the pre surgical radiographs it is suggested that performing eminoplasty or eminectomy is contraindication.[10] Accidental exposure of zygomatic cells during surgical procedures may provide possible opportunity for cranial sepsis and infection.[8]

## 10. Conclusion

Zygomatic air cells are variants of mastoid air cell system. Although they have been identified a long time ago, not many clinicians seem to be aware of. Recognizing this rare variant is essential for patient education as well as to plan alternate surgical procedures.

## Conflicts of interest

The author has none to declare.

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