

LETTER TO THE EDITOR

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# Absent frontal sinus: an uncommon radiological finding that should not be missed in CT report—letter to the editor

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Dear Editor

Paranasal sinuses are the cavities at the skull that make it lighter in relation to its volume. Sinuses are present on both sides at their locations either frontal, ethmoid, maxillary, or sphenoid sinuses [1]. Aplasia or agenesis of sinuses can occur alone or in association with other syndromes and can occur also unilateral or bilateral [2]. Frontal and maxillary sinuses are the most common site for agenesis. Researches about frontal sinus agenesis were conducted in Saudi Arabia [1], Turkey [2], and India [3], which revealed an incidence ranging from 2.5 to 3.8%. So generally it is not a common finding. The incidence of unilateral frontal agenesis is relatively more common than bilateral. The right side is more affected than the left, and it is relatively more common in females than in males [1–3].

Computed tomography (CT) scan is the imaging modality of choice for the assessment of paranasal sinuses. CT scan is able to explain many pathological findings of paranasal sinuses such as acute or chronic sinusitis, mucocele, and neoplasm. The absent frontal

sinus is an imaging finding that may be an incidental finding in normal cases that have a CT skull for any cause other than a scan of paranasal sinuses (e.g., CT brain, orbit, maxillofacial) or CT scan of paranasal sinuses due to a complaint related to it [3]. X-ray paranasal is not enough to confirm diagnosis of either agenesis or total opacification of the sinus due to inflammatory or neoplastic causes, which can give the same X-ray appearance. Therefore, a CT scan is the best modality to assess paranasal sinuses without the need to expose a patient to an X-ray with low diagnostic value. Agenesis of other sinuses is much less common than that of the frontal sinus. Frontal sinus agenesis alone needs no treatment or intervention. The absence of a frontal sinus makes the skull more heavy and increases the sense of frontal headache [4, 5]. In this case, a 34-year-old female patient presented with a frontal headache of unexplained duration. ENT doctor requested an X-ray of the paranasal sinuses, which was done and revealed totally opacified frontal sinuses, and CT was recommended and done.

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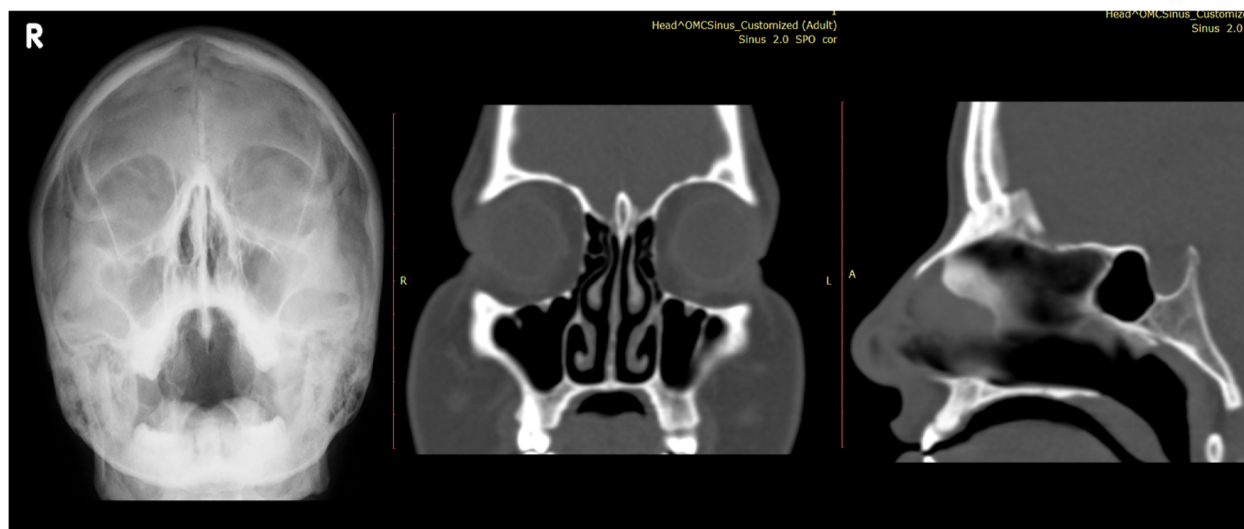
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**Fig. 1** **A** X-ray paranasal sinus (occipito-mental view) view showing totally opacified frontal sinuses. **B, C** CT scan, coronal and sagittal revealed bilateral absent frontal sinuses

It revealed agenesis of both frontal sinuses with no other abnormality detected in the CT scan (Fig. 1). This uncommon percentage of frontal sinus agenesis must be considered during pre-surgical planning related to the sinuses [2]. So, it should be mentioned in the report of radiologists as it may also be the leading cause of patient complaints of headaches.

#### Abbreviation

CT Computed tomography

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Single author.

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#### Availability of data and materials

All data and materials in the article are available and original from work files with permission of management of using it for research purposes without disclosure of the patient's personal data not related to the research filed.

#### Declarations

##### Ethics approval and consent to participate

Not applicable.

##### Consent for publication

Written informed consent for publication of the patient's clinical details was obtained from the patient.

##### Competing interests

The author declares that he has no competing interests.

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#### References

1. Assiri KS, Alroqi AS (2021) Frequency of the frontal sinus aplasia among Saudi Arabian population. A single-center retrospective case review. *Saudi Med J* 42(2):228–231. <https://doi.org/10.15537/smj.2021.2.25617>
2. Çakur B, Sumbullu MA, Durna NB (2011) Aplasia and agenesis of the frontal sinus in Turkish individuals: a retrospective study using dental volumetric tomography. *Int J Med Sci* 8(3):278–282. <https://doi.org/10.7150/ijms.8.278>
3. Sheriff RM, Moideen CP (2017) Incidence of frontal sinus aplasia in Indian population. *Int J Otorhinolaryngol Head Neck Surg* 3:108
4. Alshaikh N, Aldhurai A (2018) Anatomic variations of the nose and paranasal sinuses in Saudi population: computed tomography scan analysis. *Egypt J Otolaryngol* 34:234
5. Gotlib T, Kuźmińska M, Held-Ziółkowska M et al (2015) Hidden unilateral aplasia of the frontal sinus: a radioanatomic study. *Int Forum Allergy Rhinol* 5(5):441–444. <https://doi.org/10.1002/alr.21452>

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