Fibrous Dysplasia-Like Appearance of the Frontal Process of the Maxilla on CT: Prevalence in North China

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SUMMARY: The frontal process of the maxilla occasionally shows a localized FD-like appearance. The purpose of this study was to determine its prevalence and findings on CT. A retrospective study of 1000 consecutive paranasal sinus CT scans was performed on outpatients without a history of trauma or previous surgery in our hospital during 6 months. CT images were interpreted independently by 2 experienced head and neck radiologists on a PACS system in a bone window setting. Of the 1000 patients (546 males; 454 females), 51 (5.1%, 41 males and 10 females) had an FD-like appearance in the frontal process of the maxilla. There was a statistically significant difference between sexes (P < .001). Twenty-nine (56.9%) entities arose from the right frontal process and 22 (43.1%) from the left frontal process. These entities, with well-defined margins, were located at the base of the frontal process of the maxilla, appearing as an ovoid or triangular configuration on axial-plane CT and as a spindle or elliptic shape on the coronal plane. The mean maximal diameter was 9.8 mm (range, 3.6–16.1 mm). These entities exhibited a pagetoid appearance (type I) in 37 (72.5%), a ground-glass appearance (type II) in 8 (15.7%), and a cyst-like appearance (type III) in 6 (11.8%) patients on CT. The FD-like appearance of the frontal process of the maxilla is not rare and can be readily detected by CT.

ABBREVIATIONS: FD = fibrous dysplasia

During the past 10 years, we have incidentally encountered a few people with an FD-like appearance of the frontal process of the maxilla by paranasal sinus CT in our daily practice. These individuals usually presented to the ear, nose, and throat clinic with rhinosinusitis symptoms and underwent paranasal sinus CT scans. On the basis of outpatient medical records, they had no facial deformities on physical examination. To the best of our knowledge, no relevant studies on the records, they had no facial deformities on physical examination. To the best of our knowledge, no relevant studies on the records, they had no facial deformities on physical examination. To the best of our knowledge, no relevant studies on the records, they had no facial deformities on physical examination. To the best of our knowledge, no relevant studies on the records, they had no facial deformities on physical examination. 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Results
The study population consisted of 546 (54.6%) males and 454 (45.4%) females with a median age of 41.2 years (range, 8–89 years). Among 1000 patients, 736 (73.6%) had paranasal sinusitis.

Of the 1000 patients, 51 (5.1%) were identified with an FD-like appearance in the frontal process of the maxilla, including 41 men and 10 women, with a median age of 47.3 years (range, 22–83 years). There was a statistically significant difference between sexes ($P < .001$). The primary clinical manifestations were as follows: nasal obstruction in 43 (84.3%) patients, rhinorrhea in 38 (74.5%), headache in 24 (47.1%), and dysosmia in 8 (15.6%). Of the 51 entities, 29 (56.9%) arose from the right frontal process and 22 (43.1%) from the left frontal process. Of the 10 women, 7 (70%) showed an FD-like appearance in the left frontal process, and 3 (30%) in the right frontal process. Of the 41 men, 26 (63.4%) showed an FD-like appearance in the right frontal process, and 15 (36.6%) in the left frontal process. There was no statistically significant difference between right and left frontal processes of the maxilla in these 51 patients ($P = .483$).

These entities were located at the base of the frontal process of the maxilla, adjoining the lacrimal sac. All entities showed relatively well-defined margins and appeared as an ovoid or triangular configuration on axial CT planes and as a spindle or elliptic shape on coronal planes. Their mean maximal diameter was 9.8 mm (range, 3.6–16.1 mm). These entities showed type I in 37 (72.5%) (Fig 1), type II in 8 (15.7%) (Fig 2), and type III in 6 (11.8%) patients (Fig 3) on CT. There were no statistically significant differences as to sex ($P = .146$) or side ($P = .389$) among the 3 patterns. In addition, these entities caused localized thinning of the bony cortex, without crossing the bony suture. The contour of the affected region of the frontal process usually showed slight expansion; however, these entities did not significantly compress and obstruct the surrounding structures.

No similar manifestation was detected in other craniofacial bones on CT images. Of the 51 patients, 35 (68.6%) had paranasal sinusitis.

Discussion
The frontal process of the maxilla has an irregular shape, attached to the frontal, nasal, and lacrimal bones. It forms the anterior lacrimal crest of the lacrimal fossa and also contributes to the osseous part of the nasolacrimal duct. It occasionally produces an FD-like appearance, which can be easily demonstrated on CT. The etiology of this finding is unknown at present; however, we speculate that it may be related to the
The FD-like prevalence was 5.1% in our study, thus it is important to recognize this as a common finding in healthy populations. In the past, due to low resolution of the paranasal sinus or nasal bone radiographs, most entities were not demonstrated by this conventional imaging technique. However, with the development of CT and wide clinical application of paranasal sinus CT in recent years, we have observed more and more cases; the true incidence may be even higher in the future due to further recognition.

Treatment for this entity is not necessary unless there is significant deformity or loss of function.8-10 Accurate identification of the FD-like appearance of the frontal process of the maxilla on CT may be a great help in the differential diagnosis for diseases in this region.

A limitation of our study was that the analysis of imaging data was performed retrospectively and these entities were not proved by histopathology. In addition, the dynamic changes of these entities with time were not studied. Thus, further study is required to comprehensively elucidate the entity, including its etiology, histopathology, clinical significance, and so forth.

Conclusions

The detection of FD-like foci in the frontal process of the maxilla is not rare and can be clearly shown by CT. Similar to FD, this entity appears with typical features on CT. Although the clinical significance of this entity may be minimal, knowledge of its CT appearance may help in the differential diagnosis for diseases in this region.

References