

# Bilateral Maxillary Sinus Hypoplasia Detected By CBCT

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**Abstract:** *The maxillary sinus hypoplasia (MSH) is a rare finding. The information about this anatomic variant is very important in order to avoid diagnostic mistakes and unnecessary treatment in the region of the maxillary sinuses. Cone beam computed tomography (CBCT) is an important method used largely in implant planning. This modality is also used to represent the bone structures in details including anatomical variants in the jaws. We present a case of bilateral maxillary hypoplasia detected incidentally by CBCT.*

**Keywords:** Cone-Beam Computed Tomography, maxillary sinus, surgery, variants

## 1. Introduction

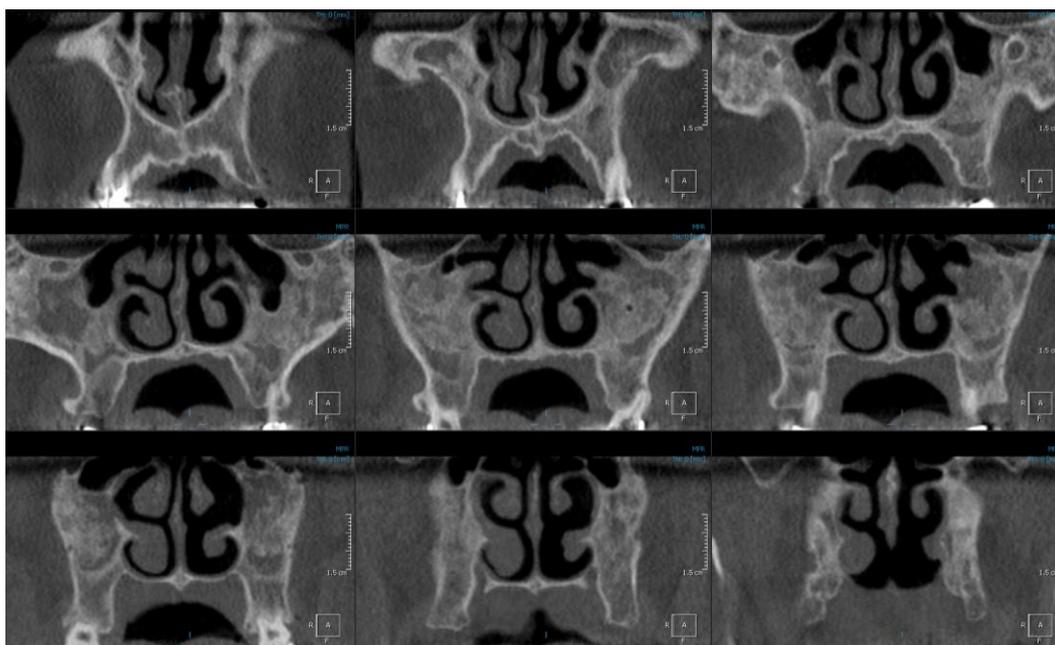
The maxillary sinus is the largest paranasal sinus and occupies the upper 2/3s of maxillary bone. Its volume is different among the individuals, depending on their dental status, age etc. [4]. The maxillary sinus is invisible throughout embryonic and foetal periods. It is visible on radiographs relatively lateley, approximately at 6 years of age [4]. Entering maxillary cavity during surgical procedures like tooth extraction, endodontic treatment, intraosseous dental implantation and others can be considered as a potential source of infection. Hence during this interventions Schneiderian membrane must be preserved [14].

In order to minimize or avoid potential complications during procedures near to the maxillary sinus cavity it is very important to know the preoperative state and anatomical varieties. The normal imaging finding on radiographs of maxillary sinus cavity includes triangular radiolucency. Space occupying pathologic processes in maxillary sinus

cavity (mucosal thickening, tumors etc.) lead to full or partial opacity sometimes with air fluid levels. The maxillary sinus hypoplasia (MSH) is a rare finding. Orbital floor depression can accompany this developmental anomaly. The hypoplastic maxillary sinus is radiopaque on radiographs. This can lead to wrong diagnosis and could be a reason for unnecessary conservative or surgical treatment.

## 2. Case Report

We present a case of 38 year old Caucasian man examined by CBCT (ILUMA™, Imtec Imaging, Ardmore, OK) before implant placement. The scan was performed using a standard exposure and patient positioning protocol (120 KV, 40 s, 3.8 mA). On coronal slices small air filled maxillary sinus cavities were found. The walls were thick with heterogeneous density. Both ostiomeatal complexes were patent.



**Figure 1:** Coronal slices (slice interval 5 mm, slice thickness 0.3 mm) representing hypoplasia of both maxillary sinuses with patent ostiomeatal complexes. The bone walls are thick and the structure is heterogeneous.

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### 3. Discussion

The pathogenesis of MSH is not well established. Obstruction of the maxillary sinus ostium is the most implicated factor in MSH development [10]. MSH can occur isolated or combined with other skeletal anomalies: hypoplasia of sphenoid, frontal sinus agenesis, scoliosis and coccygeal bone deformity [15]. It can be combined with mucosal thickening and sinusitis. MSH may be associated with facial asymmetry too [3, 13]. In our case the patient has not facial asymmetry nor ear – nose – throat complains in the past.

According to Karamody and Bassiouny this abnormality can be seen in ranges between 1.73 and 10.4% of symptomatic patients [1, 5]. The radiographs (panoramic, intraorals or Water's projection) demonstrate MSH with full or partial radiopacity engaging maxillary sinus or sinuses. CBCT is cheaper, largely available in dental offices and lead to relatively lower radiation dose in comparison with MDCT [2, 6, 8, 9, 12].

In cases before implant treatment CBCT is useful diagnostic modality to do exact bone measurements and to visualize in details maxillary sinus and the other bone structures [7, 11]. In order to exclude any pathology or to confirm maxillary sinus hypoplasia MDCT or CBCT can be methods of choice.

Clinicians especially ear – nose – throat specialists and maxillofacial surgeons should be aware about MSH in order to avoid wrong diagnosis and unnecessary treatment. MSH must be distinguished from chronic sinusitis, fibrous dysplasia, antroliths, ossifying fibroma of maxillary sinus, other odontogenous and non odontogenous tumors etc (13, 15).

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