Vascular imprint highlighting the course of the superior alveolar and middle alveolar neurovascular canal in a cone beam CT scan

Rhea Susan Verghese, Aravind Meena Shanmughan, Renju Jose, Geethu Poly

DESCRIPTION
An elderly male patient who had reported to the clinic with the chief complaint of missing teeth and wanted to get it replaced. The patient reported a history of lipomatosis and was currently scheduled to undergo treatment for the same. A cone beam CT (CBCT) image, with a 5×5 field of view of right permanent first molar to the right permanent lateral incisor, was advised for the evaluation of the edentulous site for placement of an implant. On radiographic examination, a tree-like course of the maxillary artery over the anterior wall of the maxilla, with its branches into the anterior and middle superior alveolar vessels, was noted on the volume rendering technique (VRT) image (figure 1) and the reconstructed panoramic image (figure 2). The maxillary sinus showed isodensity similar to soft tissue on the anterior wall of the maxillary sinus and the lower one-third of the maxillary sinus, which could be suggestive of sinusitis.

This finding was found to be unique in the same way that the neurovascular bundles may be noted in the intraoral periapical radiograph as radiolucent lines which traverse the course of the floor of the sinus. However, in this particular case, the presence of such a finding in the VRT image was due to the presence of isodensity along the anterior wall of the maxillary sinus as well as the thin cortical plate of the anterior maxillary sinus, which highlighted the course of the maxillary artery and the vessels branching from it. Píšová et al in their literature review spoke about the effects of the endocranial vasculature on the inner surface of the cranial vault. The most common grooves found are those of the course of the middle meningeal artery. These courses are usually caused by the endocranial pressure, the meningeal layers and bony extensions which may be present. These vascular imprints have been found to be useful in the anthropological field and forensic medicine in identifying the life history of the individual. Similar to this case, there have been no previous reports of such findings other than a study conducted by Kasahara et al in 2016, where they had compared the course of the neurovascular channels of the superior alveolar nerve and
Images in…

vessels using micro-CT in dry cadaver skulls with CBCT as well as histological analysis.1 Studies like Gomes et al. in 2020 who studied the effect of normotension and hypertension in adults using CBCT in the maxillary canine suggested that patients with hypertension had a larger pulp chamber which could be suggestive due to the high flow rate of the blood; however, until now no report of such an impression has been mentioned in the literature.4 Such features are important during procedures which involve the maxillary sinus, like the sinus lift procedure in case of implant placement.

Contributors RSV contributed to the planning, content and reporting of the manuscript. AMS contributed to the planning, content and editing of the manuscript. RJ contributed to the reviewing and editing of the manuscript. GP contributed to the initial reporting of the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Consent obtained directly from patient(s).

Provenance and peer review Not commissioned; externally peer reviewed.

Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

REFERENCES