GUEST EDITORIAL

Dental Implant Cone Beam Scans of Older Individuals Often Reveal Potentially Life-Threatening Atherosclerotic Disease

The use of cone beam computed tomography (CBCT) by dentists has enhanced the treatment-planning process for selecting optimal sites within the mandible and maxilla for successful implant placement. Large field of view CBCT units do, however, image anatomical structures beyond the jaw bones, and in older individuals these regions often harbor pathological entities in need of recognition by the dentist and timely referral of the patient to a physician. This construct was vividly demonstrated in a recently published paper, which reported that implant placement imaging studies revealed a very high prevalence rate (23.6%) of calcified atherosclerotic lesions (CALs) in the cervical and intracranial segments of the internal carotid artery among patients with a mean age of 63 years.[1] It is critical for the profession and specifically for the readership of this journal to recognize that the identification of atherosclerosis in the carotid vasculature (irrespective of the detecting imaging system) is often the harbinger of not only cerebrovascular accident/stroke, but even more frequently, life-threatening coronary artery disease (CAD).

This is borne out by a study that followed 46 male patients (mean age, 66 years) with CALs in the carotid bifurcation region on their panoramic images and a like number of vascular risk–matched controls lacking a radiograph until they developed as an endpoint an adverse cardiovascular event.[2] Twenty adverse cardiovascular events (six myocardial infarctions, six coronary artery revascularization procedures [a need for stent placement or bypass graft], three hospitalizations for intractable angina, three strokes, and two transient ischemic attacks) occurred in the study group compared to six adverse cardiovascular events (two hospitalizations for angina, one myocardial infarction, one cardiac revascularization procedure, one stroke, and one transient ischemic attack) in the control group ($P = .006$).

Consistent with these results are those obtained in the Northern Manhattan Study, which assessed 1,118 stroke-free multiethnic subjects (59% female; mean age, 68 years) using Doppler ultrasound to determine the clinical impact of CALs in the cervical internal carotid artery.[3] After adjusting for demographics and major vascular artery risk factors, those with CALs in comparison to those without CALs had a significantly increased risk of combined adverse vascular outcome (myocardial infarction, ischemic stroke, or vascular death) [hazard ratio 2.5, 95% confidence limit 1.0–5.8].

Similarly, a very recent study is also highly illustrative of the relationship between CALs in the intracranial internal carotid artery and CAD. Specifically, in this study, patients (n = 314; 65% male; mean age, 66.3 ± 12.6 years) admitted to a medical center for management of an acute ischemic stroke and believed free of CAD were provided with an unenhanced CT of the brain and, within 1 month, an unenhanced CT of the coronary vasculature.[4] The cardiac CT scan was obtained to measure the extent of coronary artery calcification (CAC). Researchers determined that the severity of intracranial vascular calcification was significantly correlated with the CAC Agatson score. These findings are very important because the Agatson score is a validated risk indicator of future adverse cardiovascular events and is commonly measured as a screening method to identify high-risk patients in the general population.[5] Furthermore, these results are substantiated by numerous autopsy studies that have confirmed that the extent and severity of atherosclerosis in the intracranial arteries are associated with the extent and severity of coronary artery atherosclerosis.[6]

Dentists reviewing CBCT scans need to be able to identify pathologic entities imaged by these studies whether they are in the maxillofacial or contiguous regions. Those lacking this skill should refer the images to a colleague capable of performing this task. This is critical because older individuals who are often candidates for dental implant placement are the ones most likely to evidence occult atherosclerotic disease of both the extracranial and intracranial carotid arteries. Expeditious referral of these patients to their primary care physician with a note detailing the imaging finding is mandated because each year in the United States more than 700,000 persons without previously recognized symptoms suffer a catastrophic vascular event.[7]

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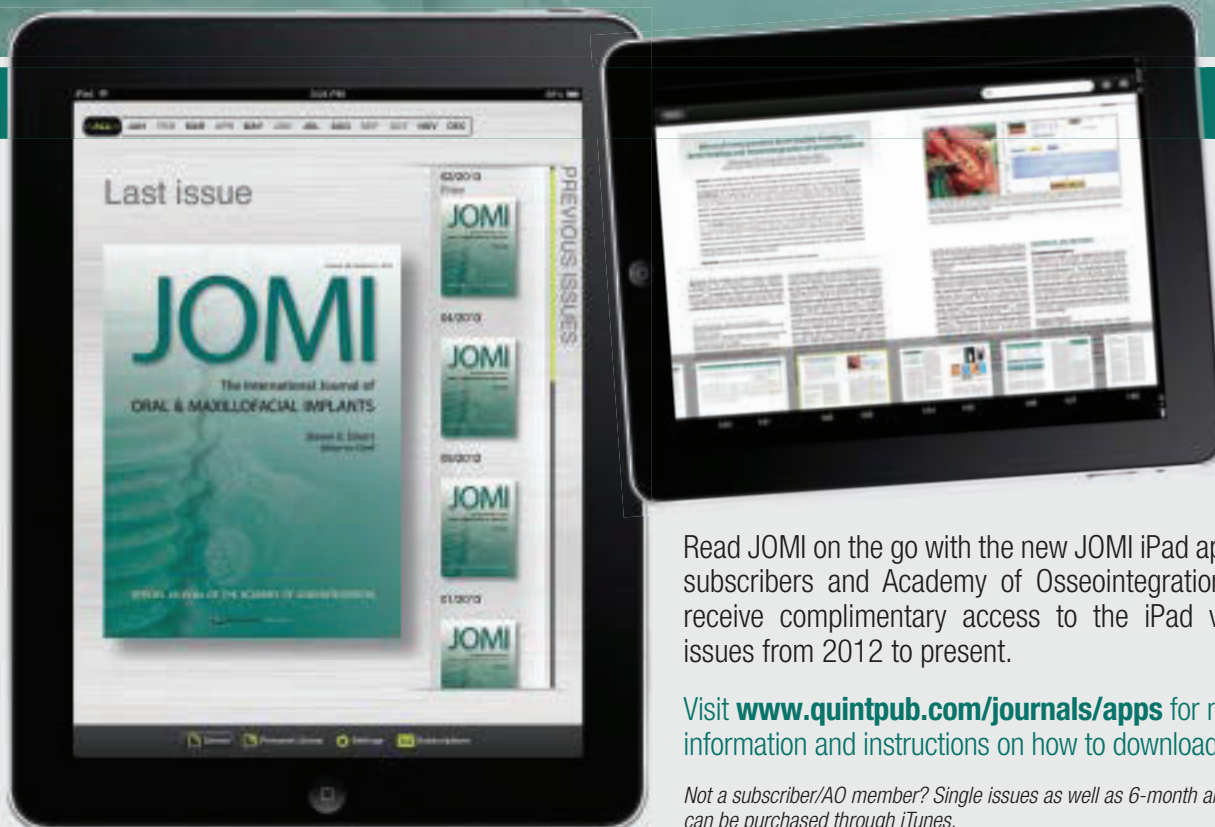arthur.friedlander@va.gov
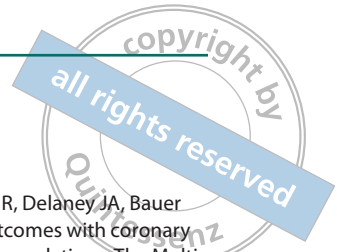
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