Implants displaced into the maxillary sinus

By Dov M. Almog, DMD, Kenneth Cheng, DDS & Mohammad Rabah, DMD

As some have predicted,1 the growth in dental implant-based procedures increased consider-ably in recent years. As a result, there has been a rapid increase in the number of practitioners involved in implant placement, including specialists and generalists, with different levels of expertise. At the same time, although at a low frequency, we are witnessing a diversity of unusual complications associated with these procedures, some of which are displaced implants into the maxillary sinus.

A literature search revealed several published reports of displaced foreign bodies into the maxillary sinus.2-6 Generally speaking, foreign bodies in the maxillary sinus include multiple displaced objects. These include teeth, roots, impression materials, dental instruments, broken burs and, more recently, dental implants. Although foreign bodies in the maxillary sinus are not common, it behooves us to familiarize ourselves with such an unusual complication and its management. Displacement of such foreign bodies into the maxillary sinus occurs following dental procedures that create an unplanned orontal perforation. The procedure associated with the removal of foreign bodies from the maxillary sinuses is considered very invasive. In this case report, the authors describe a systematic approach to the removal of two implants displaced into the right and left maxillary sinuses.

Currently, there are two accepted methods for removing foreign bodies displaced into the maxillary sinus. One method is the endoscopic transnasal maxillary sinus surgery.7,8 Access to the maxillary sinus is achieved through the nose via the ostium. The foreign body is captured and removed using an urological retrieval basket through the endoscopic working channel port. The advent of endoscopic techniques has made it the preferable choice, especially for patients with chronic sinusitis.

The most commonly used technique for retrieval of foreign bodies displaced into the maxillary sinus is the Caldwell-Luc procedure. In contrast to the endoscopic technique, which involves accessing the maxillary sinus via the nose, the Caldwell-Luc procedure involves gaining access to the maxillary sinus by the fenestration of the anterior lateral wall of the maxillary sinus or canine fossa.11-12

The Caldwell-Luc procedure offers better direct visual access to the maxillary sinus as compared to the endoscopic approach, but is considered more aggressive with potentially more serious complications. Some of the possible complications are dysesthesis of the infraorbital nerve, numbness of the maxillary teeth, injury to the floor of the orbit and facial edema. This older and perhaps less conservative technique for accessing the maxillary sinus was first introduced by two otolaryngologists (American and French) in 1889.13

Case report
A 50-year-old African-American male veteran presented to the VA New Jersey Health Care System Dental Service at East Orange seeking dental care. A comprehensive oral and maxillofacial examination included an intraoral and extraoral exam, including cancer screening, full-mouth X-rays, and a cone-beam CT (i-CAT™ 3D CBCT Imaging Sciences International, Hatfield, Pa.), which includes clear-cut panoramic and cross-sectional slices of any desired location, one obtains precise anatomical information.

Nevertheless, the chief complaint noted by the patient, and most profound clinical finding, was “two implants displaced into the right and left maxillary sinuses” (Figs. 1-5). The medical history was non-contributory.

Proceeding with careful assessment of all the available diagnostic information, and upon further discussion with the patient, several treatment options were developed in association with his retained roots, carries & missing teeth. As far as the patient’s chief complaint, one treatment option was offered to him, that is, the Caldwell-Luc procedure to remove both displaced implants in his maxillary sinuses. After careful consideration, the patient chose to proceed with the proposed treatment plan.

A Caldwell-Luc procedure was performed bilaterally under general anesthesia. Specifically, the Caldwell-Luc procedure involved making an incision in the buccal-gingival sulcus in the area of the maxillary canine and bicuspids teeth, exposing the anterior lateral wall of the maxilla. Care was taken to avoid injury to the infraorbital nerve as it exits in the infraorbital foramen. Using a bar and kerri-son’s rongeurs, a window was made through the anterior lateral wall of the maxilla, thereby gaining access to the maxillary sinus. Antral currettes and a hemostat were used to retrieve the displaced implants (Fig. 4). The sinuses were then irrigated and packed with iodoform gauze, which was later removed. The incision was closed. Post-operatively, the patient did well and no complications were reported.

Conclusions
As described in this case report, the clinical management associated with the removal of dental implants displaced into the maxillary sinuses is considered very invasive. While numerous dental reports described patients treated for displaced implants into the maxillary sinuses, none illustrated those from a preventative standpoint, that is, the use of CBCT-based dental imaging before placing dental implants.

While the quantitative relationship between successful outcomes in dental implant treatment and CBCT-based dental imaging is unknown and awaits discovery through large prospective clinical trials, the authors strongly believe that using CBCT-based dental imaging is becoming a reliable procedure from a precautionary standpoint based on a series of recent preliminary clinical studies and case reports.

References available on request.

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Recommendations
Which restorative materials were considered to have the most potential for use in developed and developing countries?
Composites and other white filling materials have replaced amalgam in several developed nations. Even in countries without any ban, such as in Japan, less than four per cent of the fillings are now fabricated with amalgam for aesthetic reasons. In addition, many patients do not find it sensible to have as toxic an element as mercury just a few centimetres from their brains. Composites and glass ionomers are also widely used in many developing countries. The question of why such developments progress so slowly in the big nations of the rich world was raised. Atraumatic restorative treatment with glass ionomers and using only hand tools is a promising alternative, not only for developing countries. In countries in which glass ionomers or composites are produced locally, the cost of these fillings is lower than that of amalgam.

Thank you very much for the interview.