

CLINICAL REPORT

Complications after use of elastomeric pressure-indicating media at 24-hour follow-up visit for immediate maxillary complete removable dental prosthesis: A clinical report



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The use of pressure-indicating media to assess the adaptation of the intaglio surface of a removable dental prosthesis to the underlying supporting tissues is an essential prosthodontic service. An ill-fitting prosthesis can contribute to pain and poor masticatory performance, and areas of isolated pressure may lead to accelerated bone resorption.^{1,2} These materials are recommended for use at the insertion and follow-up appointments to help correct for processing and technical errors,^{3,4} which can result in areas of tissue impingement by the acrylic resin. All denture-wearing patients should then continue to be seen at prescribed periodic intervals to assess prosthesis fit because residual ridge resorption is a chronic and progressive disease process that will continue over the lifetime of a patient after the loss of natural teeth.⁵

Pressure-indicating media come in a variety of formulations, including disclosing wax (Disclosing Wax; Kerr Corp), nonsetting creams (Mizzy Pressure Indicator Paste; Keystone Industries), aerosol powders (Occlude; Pascal), and elastomers (Fit Checker Advanced; GC America Inc). The use of irreversible hydrocolloid material as a pressure-indicating medium has also been reported.⁶ Studies have investigated various pressure-indicating media in an attempt to determine whether one type has a clinical advantage over another in the detection of potential pressure areas on tissue.^{7,8} Other

ABSTRACT

Various pressure-indicating media are available to assess the adaptation of the intaglio surface of a removable dental prosthesis at the insertion and follow-up appointments. This clinical report describes the use of an elastomer that entered the maxillary sinus through an undetected oroantral communication at the 24-hour follow-up for an immediate maxillary complete removable dental prosthesis. A Caldwell-Luc sinusotomy procedure was required to remove the material, and the patient required over 1 year of healing time before his reported symptoms resolved. (J Prosthet Dent 2017;117:702-705)

studies have suggested clinical guidelines for their use.⁹⁻¹¹ The nonsetting materials such as pressure-indicating paste can accurately detect an area of impingement⁷ or contact versus noncontact between the acrylic and underlying tissues. Disclosing waxes and elastomers are advantageous when assessing the need for a reline procedure because they provide a 3-dimensional perspective.¹¹ Recent investigators proposed the use of the nonsetting paste type to determine the need for relines based on paste spread width.¹⁰ The material selected should be aligned with the intended clinical purpose of the practitioner.

After the removal of maxillary posterior teeth, a nonphysiologic communication between the oral cavity and maxillary sinus can develop. Referred to as an oroantral communication (OAC), the incidence reported in dental studies after extraction of maxillary posterior teeth has been between 0.3% and 13.0%.¹²⁻¹⁴ The anatomic proximity of the root apices of these teeth to the sinus can facilitate an OAC upon extraction. Local pathologic processes can erode the contiguous cortical bone and cause an OAC.¹⁵ The OAC may be difficult to

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Figure 1. Intraoral view of irregular alveolar ridge and oroantral defect on maxillary left.

detect clinically,^{16,17} and if left untreated, it may rapidly lead to acute sinus disease.¹⁸

This clinical report describes the use of an elastomer at the 24-hour follow-up appointment for an immediate maxillary complete removable dental prosthesis (IMCRDP), where material entered the maxillary sinus through an undetected OAC.

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A 65-year-old man sought prosthodontic consultation for a definitive maxillary complete removable dental prosthesis and a definitive mandibular partial removable dental prosthesis. A review of his dental history revealed an ongoing OAC for the 16 months after insertion of his IMCRDP. The patient also presented with an interim mandibular partial removable dental prosthesis, retaining the mandibular canines, that was deemed clinically acceptable. Intraoral examination revealed irregular alveolar ridge contour of the maxillary left posterior region with an area suggestive of an oroantral defect (Fig. 1). His medical history was unremarkable. His dental history indicated that previous dental extractions were reported to have been well tolerated and uncomplicated at the time of prosthesis insertion. At the 24-hour visit, the practitioner had used an elastomer (Fit Checker Advanced; GC America Inc) to assess the tissue adaptation of the maxillary prosthesis. Following the manufacturer's recommendations, the material was placed inside the IMCRDP, seated in the mouth, and held with controlled pressure until the material had polymerized. Upon removal of the prosthesis, a suction sound was heard and the patient felt remarkable discomfort, pointing to the area of his left midface. Intraoral examination revealed an extension of the elastomeric material protruding from the area of the left maxillary molars. The patient reported continued pain and was

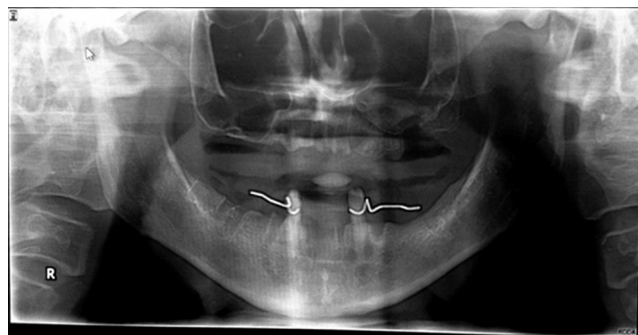


Figure 2. Panoramic radiograph after extractions with elastomeric material within sinus.

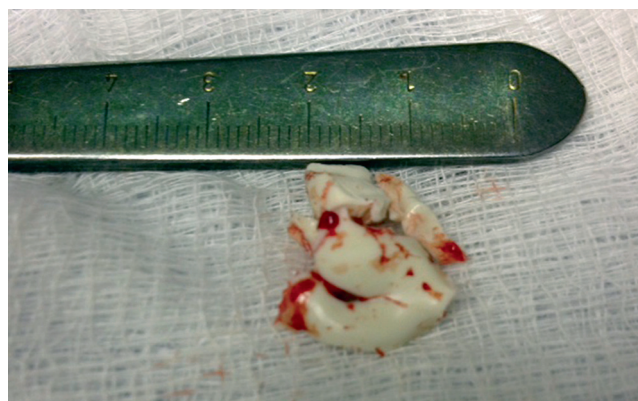


Figure 3. Elastomeric material recovered from sinus after Caldwell-Luc sinusotomy.

immediately referred to an oral and maxillofacial surgeon for evaluation and treatment. A panoramic radiograph revealed a cloudy appearance in the left sinus (Fig. 2). The surgeon performed a Caldwell-Luc sinusotomy and removed the residual pressure-indicating elastomeric material (Fig. 3). The OAC was no more than 1 mm in diameter and virtually invisible upon intraoral inspection. The area of the OAC was left to close mostly because of its small size. The patient received instruction regarding nasal precautions for the next 14 days and was placed on an antibiotic and systemic decongestant.

The patient was seen by the surgeon 1 week post-operatively, and healing appeared normal, with no signs of air or fluid leakage from the nose to the mouth. By 3 weeks, the area appeared covered by healthy mucosa, and the patient was referred back to the dentist for further treatment.

Six weeks later, at a follow-up visit, the IMCRDP had become nonretentive. A soft reline material (Coe Soft; GC America Inc) was placed inside the prosthesis. After the material had polymerized, the prosthesis was removed from the mouth, and the patient again felt pain in the area of the previous OAC. Intraoral examination revealed a protruding extension of reline

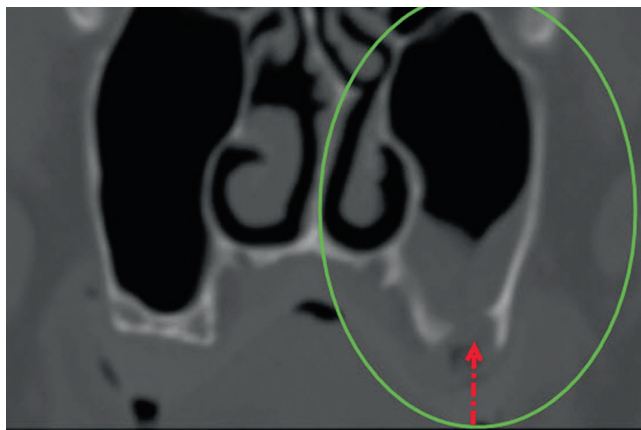


Figure 4. Computed tomographic scan, coronal view.

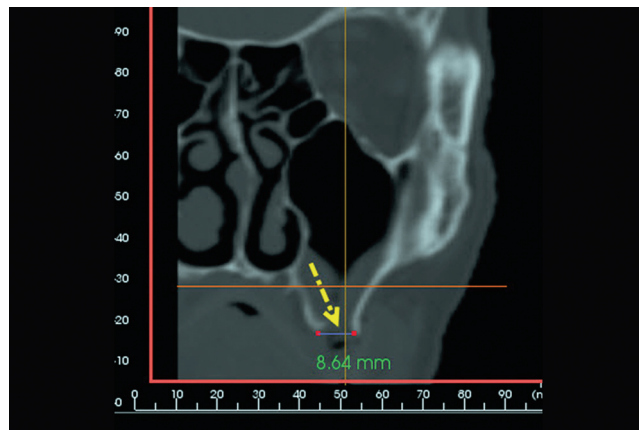


Figure 5. Computed tomographic scan expanded with measurement, coronal view.

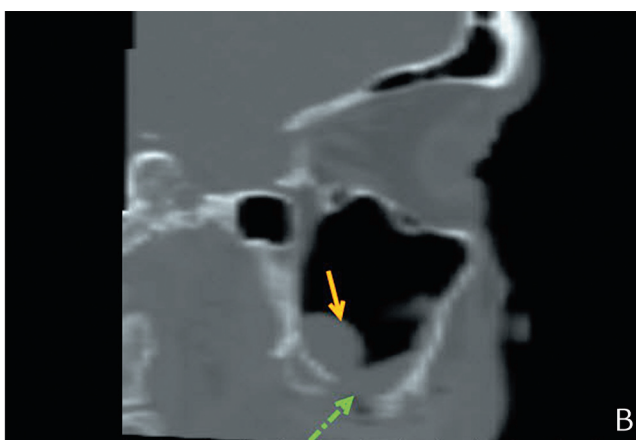
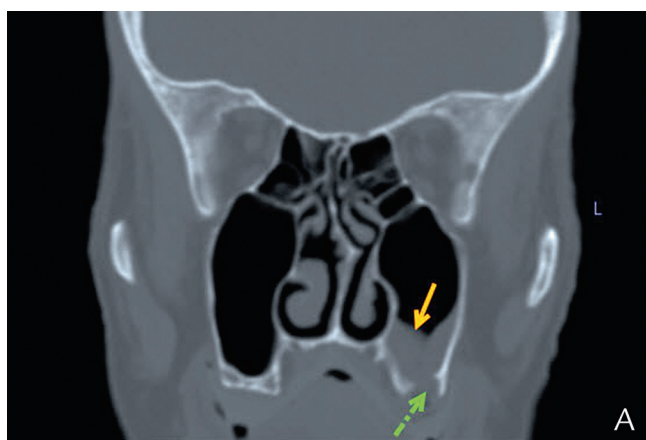


Figure 6. A, Coronal view of left maxillary sinus. B, Sagittal view of left maxillary sinus.

material from the same area as before. The patient was immediately referred back to the oral surgeon, who then ordered computed tomography of the paranasal sinuses (Fig. 4). The computed tomographic scan revealed a discontinuity in the floor of the left maxillary sinus (Fig. 5) in the region of the left maxillary molars measuring approximately 8 mm in diameter. The discontinuity involving the palatal cortex is consistent with an OAC. Also noted was a localized homogeneous radiopaque band similar to a soft tissue thickening in the sinus involving the area above the left maxillary molar region in coronal and sagittal views (Fig. 6). Radiographically, this soft tissue thickening/radiopaque band could not be ascertained as disease, as this may also have represented remnant foreign dental material in the sinus. The patient was advised of these findings, and he declined any additional surgical procedures.

After 1 year of additional healing and follow-up visits to assess the immediate interim prostheses, the patient reported that he had not experienced any sinusitis symptoms for the previous 3 months. During this

extended healing period, soft interim relined material (COE Soft; GC America Inc) was periodically and uneventfully placed inside the existing IMCRDP using a piece of aluminum foil shaped slightly larger than the defect and placed over it.

The definitive treatment decision to manage the area of the defect prosthodontically using a conventional complete removable dental prosthesis was made because of the patient's symptom-free 3-month history and his unwillingness to pursue further surgery. This conventional prosthesis acted to both obliterate the defect and to restore function.

DISCUSSION

Pressure-indicating media should be routinely used at both the insertion and follow-up visits for removable prostheses; however, the material selected should be aligned with the intended purpose the clinician is evaluating. Denture textbooks routinely demonstrate the use of nonsetting pressure-indicating paste to

assess the adaptation of the denture to the tissue and look for potential areas of impingement.^{3,4} Nonsetting materials have the advantage of low risk of aspiration,¹⁰ unlike the setting type, whose high flow characteristics and risk of aspiration are included in the manufacturer's instructions. If a quantitative 3-dimensional evaluation is required to assess the need for a reline, a safer alternative has been recently proposed¹⁰ in which a nonsetting paste is used and evaluated based on paste spread width. Because of the high incidence¹²⁻¹⁴ and difficult clinical detection^{16,17} of OACs after maxillary posterior tooth extractions, any highly flowable material that could enter the sinus should be avoided until complete healing has been ascertained. If a soft reline is necessary and an OAC is suspected, covering the area of concern with cotton gauze may prevent ingress of the material into the sinus and aid in retrievability of the material.

This clinical report demonstrated that what appeared to be a healed OAC was actually not. Good communication among all dental providers when delivering interdisciplinary treatment is essential for a successful outcome.

SUMMARY

This clinical report described the importance of proper material selection in assessing tissue adaptation of an immediate prosthesis on incompletely healed extraction sites. The use of an elastomeric pressure-indicating medium led to the development of complications due to an undetected OAC. Given the patient's unwillingness to consent to further surgical intervention, and given the absence of symptoms, the OAC was managed prosthodontically by using a conventional complete removable dental prosthesis to cover the defect. Frequent and regular follow-up visits are critical to help avoid further postoperative complications.

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