

Maxillary Sinus Impaction of a Core Carrier Causing Sustained Apical Periodontitis, Sinusitis, and Nasal Stenosis: A 3-year Follow-up

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Abstract

Introduction: The aim was to present a case report of a full-length extrusion of an obturator's core carrier into the maxillary sinus, causing clinical symptoms from the nose region with differential diagnostics aspects, which, in turn, led to several surgical treatments of the nostrils before diagnosis and correct endodontic retreatment of a maxillary right first molar. A 36-year-old man presented in 2012 with complaints from the right nostril region. Medical treatment with antibiotics and surgical procedures because of nasal stenosis resulted only in partial improvement. Five years earlier, a root canal treatment was performed on the maxillary right first molar. Intraoral radiographs revealed 10-mm overfilling of root filling material into the maxillary sinus from the palatal root of tooth #3. **Methods:** Before surgical removal of the excess root filling material, orthograde revision was performed. Cone-beam computed tomographic imaging was used to localize the position of the root filling material, which protruded through the maxillary sinus and reached the inferior nasal wall. **Results:** Surgical removal from the palatal aspect revealed that the root filling material was a core carrier of an obturator. Scanning electron microscopy and transmission electron microscopy showed evidence of microbial biofilm on the core carrier as well as remnants of sinus mucosa. At the long-term follow-ups, the tooth had healed apically, and symptoms of nasal stenosis were markedly reduced. **Conclusions:** This case report represents a challenging differential diagnostic topic urging the importance of a medical and dental interdisciplinary dialogue. The use of cone-beam computed tomographic imaging was crucial for the surgical retreatment. (*J Endod* 2016; ■:1–8)

Key Words

Biofilms, cone-beam computed tomography, core carrier, culturing, endodontics, nasal stenosis, scanning electron microscopy, transmission electron microscopy

The use of obturators with a core carrier was introduced several decades ago (1) and has been a rational and fast approach (2) for root canal filling comparable with the lateral condensation technique (3, 4).

One challenge has been to control the apical extrusion of material (5, 6). A meta-analysis has shown that warm gutta-percha obturation shows a higher rate of overextension than cold lateral condensation (7). Numerous reports and reviews in the literature have described complications caused by overextension of root filling materials into the periapical tissues or the maxillary sinuses (Supplemental Table S1 is available online at www.jendodon.com). It is well-known that root canal treatment more often fails when the root filling is too long, as evidenced by persistent apical radiolucency (8–10). One cause of the extruded root canal material is that the root may have been overinstrumented and the apical seat was not created. The consequence is that the apical seal is leaking whereby remnants of a root canal biofilm may cause reinfection. Also, bacteria may colonize the surface of the extruded material sustaining apical inflammation (11, 12). However, a core carrier of an obturator has never been reported as being fully extruded, hence being a focus of sustained periapical infection. This case report presents a clinical case of an endodontic overfilling of the palatal root of a maxillary right first molar with a core carrier. The core carrier was impacted in the maxillary sinus for more than 5 years after endodontic treatment. This report describes the retreatment including the surgical technique for the palatal removal of the core carrier. In addition, the core carrier was examined for the presence of microbial biofilm using scanning (SEM) and transmission electron microscopy (TEM).

Concomitant with the displacement of the core carrier, the patient developed marked unilateral irritation and blocking of the right nostril. Over the years, the patient

Significance

Obturators with a core carrier may be difficult to control. The carrier can be apically extruded, causing sustained infections in neighboring regions. For prevention, working length measurement is mandatory. CBCT imaging was crucial for the surgical removal in the maxillary sinus.

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Case Report/Clinical Technique

had undergone several hospitalized treatments targeting the nose region but with no satisfying result. Accordingly, this report also underlines the importance of interdisciplinary communication between the medical and dental specialties.

Materials and Methods

The subject was a 36-year-old white man who in 2012 attended the pregraduate student clinic section of cariology and endodontics at the Department of Odontology, University of Copenhagen, Copenhagen, Denmark, with a request to have his teeth examined. Concomitantly, he described his chief complaints as daily stuffiness, itching, bleeding, crust formation, pain, nasal stenosis of the right nostril, and signs of inflammation (Fig. 1A), which had been ongoing for several years. The dental and radiographic examination revealed that the maxillary right first molar was root filled with an extensive 10-mm overfilling of the palatal root (Fig. 1B). Confronted with the right-side complaint and the status of the maxillary right first molar, a potential link between these observations was made, and the patient was further referred to the special endodontic clinic section at the University of Copenhagen.

Medical History

A general examination revealed an otherwise generally healthy person with no presence of disease or use of medicine, but his medical history was significant for nasal stenosis. In 2007, he had undergone a septoplasty procedure of the nose. In 2009, he was further examined as a result of a suspected diagnosis of Wegener granulomatosis, but this diagnosis was disproved. Then, ear, nose, and throat doctors provided treatments with topical antibiotics (Bactroban [GSK Pharma, Brøndby, Denmark] and Fucidin [LEO Pharma, Malmö, Sweden]) after positive cultivation of *Staphylococcus aureus* and streptococci bacteria. This only had a temporary effect, and a rhinoseptoplasty procedure, because of ongoing nasal stenosis, was reperformed. In 2011, yet another rhinoseptoplasty was performed because of persistent symptoms of crust formations, slight bleeding, and nasal stenosis caused by scar tissue, signs that were still present at this stage (Fig. 1A).

Dental History

The examination of the maxillary right first molar showed no signs of periodontal disease. A direct resin restoration was placed with no clinical evidence of leakage. No intraoral pain or swelling from surrounding soft tissue was present. Pain upon percussion was noted, but there were no symptoms on biting, palpation, or mobility testing. In addition, no pockets were found on probing. A past dental history disclosed that the patient recalled having root canal treatment of the

right maxillary molar performed in Mexico 5 years before the inquiry. Also, he recalled that shortly after this treatment a sort of partial constriction of the right nostril developed. The diagnosis was #3 previously treated and symptomatic apical periodontitis. The initial treatment was orthograde retreatment, and the patient was informed about the risks before all procedures. In particular, he was told that if the conventional retreatment did not succeed, a surgical retrograde approach would be needed and that a perforation to the sinus would occur. Consent was obtained from the patient.

Clinical Procedures

Orthograde retreatment was performed. For local anesthesia, 1.8 mL Citanest Dental Octapressin (Dentsply Sirona, Salzburg, Austria) was administered (concentrated prilocaine 30 mg/mL + felypressin 0.54 μ g/mL). After rubber dam isolation, the tooth was reopened and disinfected with 30% hydrogen peroxide solution and 10% iodine. With the use of an operating microscope, gutta-percha was removed from buccal roots using ProTaper Retreatment files (Dentsply Maillefer, Ballaigues, Switzerland) and Hedström files (SybronEndo Corporation, Orange, CA) without the use of solvents. Upon removal of the palatal root filling, copious amounts of exudate and immediate relief of pressure were noted by the patient. However, the extruded root canal material could not be removed, and retrograde surgery was scheduled. The root canals were irrigated with 2.5% sodium hypochlorite (25 mL), and 17% EDTA was placed in the root canals for 2 minutes followed by a calcium hydroxide (CH) dressing and a temporary restoration. In between visits, cone-beam computed tomographic (CBCT) imaging was recorded (Fig. 2A), which detailed the protrusion of the root canal material from the palatal root of the maxillary right first molar, traversing the medial antrum of the right maxillary sinus and reaching the inferior bone of the nasal cavity. The material did not resemble gutta-percha. At the second visit, the patient was scheduled for completion of the orthograde retreatment protocol. After an identical preparation of an aseptic working field including the removal of CH, a 5% iodine–potassium iodide (IPI) dressing was applied for 15 minutes. The IPI was removed with 2.5% sodium hypochlorite and dried, and the root canals were obturated with sealer (Apexit; Ivoclar Vivadent Inc, Amherst, NY) and gutta-percha (the cold lateral condensation technique) (Fig. 2B).

The surgery was performed at a third visit. Local anesthesia was administered using lidocaine/epinephrine 1.8-mL buccal infiltrations and 1.2 mL at the foramina palatinus major and foramina incisivus (concentrated lidocaine hydrochloride 20 mg/mL + adrenaline 12.5 μ g/mL). The surgery was performed using a palatal approach.

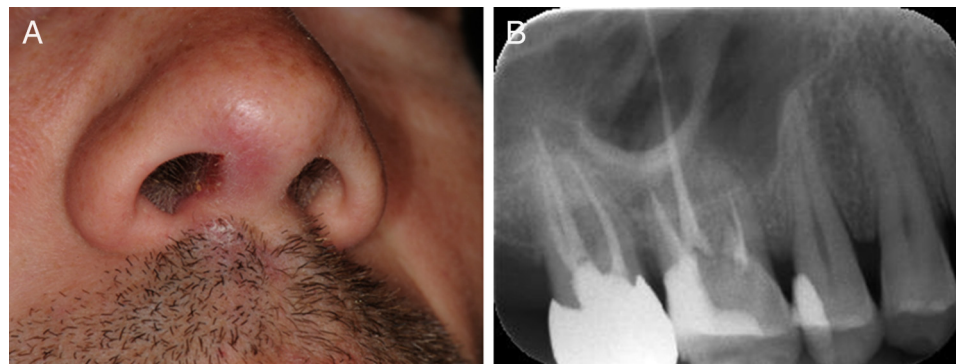


Figure 1. (A) A pretreatment clinical image of the nose and (B) upper right first molar with extruded root filling material from the palatal root (radiograph) into the maxillary sinus.

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