



## CASE REPORT

# Maxillary sinusitis as a complication of an extruded gutta-percha: a case report

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## ABSTRACT

The purpose of this article is to report the maxillary sinusitis caused by the extruded root canal material into the sinus. A 35-year-old woman was referred to our clinic with facial pain, accompanied by sinusitis, swelling, tenderness to palpation and sensitivity to chewing in the right maxillary region. The radiograph showed extruded gutta-percha (GP) from the apex of the right maxillary second premolar into the maxillary sinus. A well-circumscribed radiopaque mass in relation to the root and extending into the sinus owing to chronic inflammation was easily observed. Surgical management was performed under local anaesthesia. The inflammatory tissue around the apex of the tooth was removed by the help of a curette. The root end and the extruded GP were resected with a fissure bur, and the sinus was irrigated with saline solution. An initial panoramic radiograph will reveal the proximity of the apices to the maxillary sinus. Using an electronic apex detector, applying a good apical stop, or moderate condensation will help to avoid overfilling or overextending of the endodontic material. Besides, periapical radiographs can also be taken to avoid any mistakes. However, contaminated root canal materials can easily induce maxillary sinusitis or aspergillosis.

## INTRODUCTION

Maxillary sinusitis of odontogenic origin have been reported with the perforation of schneiderian membrane, which occurs due to dentoalveolar or periodontal surgery, dental trauma, periapical abscesses and extrusion of the endodontic materials.<sup>1-4</sup> In most cases, roots of the maxillary teeth are in a close relationship with the floor of the maxillary sinus or apices protrude into the

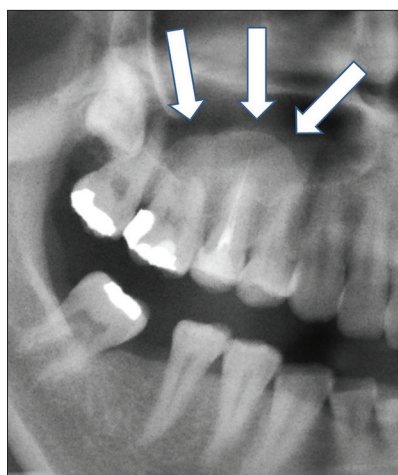
sinus.<sup>5</sup> Overinstrumentation and extrusion of the endodontic obturation materials during root canal treatment of the maxillary molar teeth may also cause sinusitis or aspergillosis due to the zinc oxide based cements.<sup>6,7</sup> Aspergillus has a dense opacity foreign body reaction associated with the maxillary sinus infection; however, not all extrusions cause aspergillosis in the maxillary sinus.<sup>8</sup> The purpose of this article

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is to report the maxillary sinusitis caused by the extruded root canal material into the sinus.

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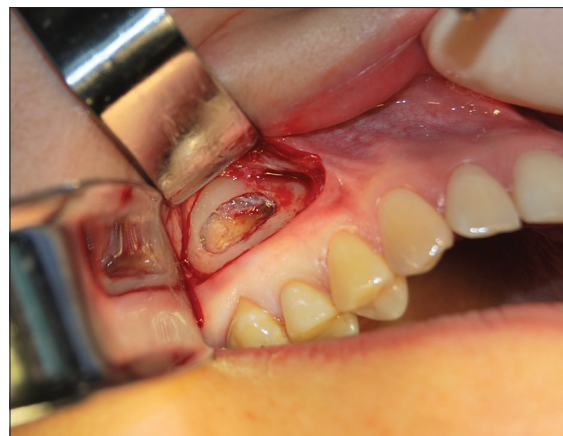
A 35-year-old woman was referred to our clinic (Baskent University, Faculty of Dentistry, Oral and Maxillofacial Surgery Department, Ankara, Turkey) with facial pain, accompanied by sinusitis, swelling, tenderness to palpation and sensitivity to chewing in the right maxillary region. The patient revealed having undergone an endodontic treatment on the right maxillary second premolar nearly a year ago. Clinical examination revealed no probing depth along the root or mobility; but, a positive response to percussion on the related tooth. A panoramic radiograph was taken for further examination. The radiograph showed the root to be in close proximity to the sinus. Besides, the root canal treatment had been finished, and a five millimeters gutta-percha (GP) was extruded from the apex into the maxillary sinus. Moreover, a well-circumscribed radiopaque mass in relation to the root and extending into the sinus owing to chronic inflammation was easily observed (Figure 1). After the diagnosis and



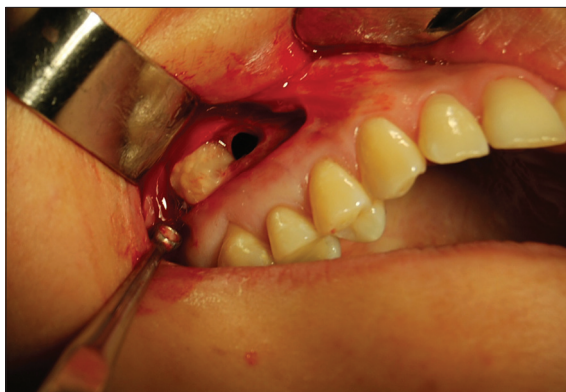
**Figure 1.** Extruded gutta-percha from the apex and a well-circumscribed radiopaque mass in the sinus.

consultation with an endodontic specialist, it was decided to perform apical surgery with access via the maxillary sinus.

Surgical management was performed under local anaesthesia of 4% articaine hydrochloride (HCL) with 1:100.000 adrenaline. Lateral wall of the maxillary sinus was seen after elevating the buccal flap from mesial of the first premolar to distal of the second molar. Besides, the lateral aspect of the sinus was exposed by using a round bur under irrigation (Figure 2). The inflammatory tissue around the apex of the tooth was removed by the help of a curette (Figure 3). The root end and the extruded GP were resected with a fissure bur, and the sinus was irrigated with saline solution. The flap was sutured with a 3-0 silk suture. The patient was prescribed to take Amoxicillin (Augmentin® GlaxoSmith Kline, Istanbul, Turkey) 1000 mg BID tb/12h for a week, Flurbiprofen (Majezik® Sanovel, Istanbul, Turkey) 100 mg tb/12h for a week, and 0.12% Chlorhexidine-gluconate solution (Kloroben® Drogas, Ankara, Turkey) three times a day for a week. Sutures were removed on the seventh day. The healing was uneventful. The patient did not show any post-operative symptoms for one year, and the radiograph showed normal anatomic formation (Figure 4).



**Figure 2.** Lateral aspect of the sinus was exposed by using a round bur under irrigation.



**Figure 3.** Inflammatory tissue around the apex of the tooth was removed.



**Figure 4.** Panoramic radiograph taken one year after the surgery shows normal anatomic formation.

The histopathologic examination revealed that the inflammatory cell infiltration was included in the connective tissue, but showed no evidence of aspergillosis.

## DISCUSSION

Several complications arise due to inadequate or incorrect treatment of the root canals. Some of the complications related to the overextension and/or overfilling of the maxillary molar or premolar are aspergillosis and sinusitis of odontogenic origin, orbital abscess, orbital pain, headache, etc.<sup>9</sup> Owing to the anatomic locations, maxillary sinuses could be easily

invaded by microorganisms from the oral cavity. About one-tenth of the cases related to maxillary sinusitis originated from odontogenic sources.<sup>10</sup> A higher incidence of anaerobic bacteria found in acute maxillary sinusitis caused by odontogenic infections.<sup>3</sup> In 40% cases, the roots of first and second maxillary molars were close to the floor of maxillary sinus.<sup>11</sup> Due to this close relationship between the root of maxillary premolar-molar teeth and the maxillary sinus, careful radiographic diagnosis must be done during the endodontic treatment of these teeth.<sup>6</sup> However, an accidental perforation of the schneiderian membrane during the root canal treatment or an intrusion of the obturation materials into the maxillary sinus may also cause sinusitis or aspergillosis.<sup>12</sup>

In this case report, there was no alveolar bone between the apex of the roots and the sinus membrane; consequently the roots of the maxillary teeth were in the maxillary sinus. Besides, the poorly fitting master cone was extruded five millimeters into the sinus without even being realised. This inexcusable mistake of the clinician caused an infection in the maxillary sinus after one year of operation.

Based on the fact that zinc is considered as a growth factor of aspergillosis and some root canal materials include zinc oxide, the authors' first diagnosis after recognising the circumscribed radiopaque mass in relation to the root and extending into the sinus was aspergillosis. Beck-Mannagetta et al.<sup>12</sup> concluded that maxillary sinus aspergillosis was mostly caused by zinc oxide and formaldehyde including root-filling materials. Moreover, Most cases concerning aspergillosis of the maxillary sinus were related to the overextended root canal sealer in the maxillary teeth.<sup>13</sup>

In contrast to the pre-diagnosis by the authors, the histopathologic examination revealed that the inflammatory cell

infiltration was included in the connective tissue, without any evidence of aspergillosis.

An initial panoramic radiograph will reveal the proximity of the apices to the maxillary sinus. Using an electronic apex detector, applying a good apical stop, or moderate condensation will help to avoid overfilling or overextending of the endodontic material.<sup>9</sup> Besides, periapical radiographs can also be taken to avoid any mistakes. However, contaminated root canal materials can easily induce maxillary sinusitis or aspergillosis.

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