



# Non Surgical Endodontic Retreatment in a Teeth with Overextended Obturation Literature Review

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## Abstract

Background: Iatrogenic incidents are relatively common in endodontics, but statistically more difficult to happen in upper central incisors. Nevertheless, this problems sometimes affects them as well. Objective: to describe a case of gutta-percha overextension in a 29-year-old Caucasian patient. Methodology: This case report was supported by the following electronic databases: PUBMED Cental, BVs/BIREME, Web of science, Science Direct, Periodic Portal and the Cochrane Library of PROSPERO. Results: The articles collected showed that bacterial contamination associated with iatrogenic procedures are the main responsible for endodontic failures. Conclusions: although the effects of iatrogenic procedures often compromise the patient's well being, the proper endodontic therapy is enough to reestablish dental health.

**Keywords:** Endodontics; Periapical periodontitis; Root canal therapy.

## 1. Introduction

Endodontic literature is often confronted with the rate of success of its treatments; especially when a significant rate of endodontically treated teeth does not correspond to what is expected clinically and radiographically [1, 2]. Many are the reasons that favor failures in such treatments, some are inherent to a complex anatomy of teeth and others concern iatrogenic procedures such as perforations, zip preparations, underfilled canals, overfilled canals, overextended materials, missed canals, inadequate flare, loss of coronal restoration, lacerations or even contamination of the prepared canal before or after obturation. There is a common sense that non surgical root canal retreatments are usually preferable to surgical treatments, simply because the former is less invasive, as well as less traumatic to the patients. Some studies have even claimed that when little or no evidence of periapical pathology was present, or when clinical signs and symptoms were not present, even when the root filling was radiographically deficient, radiographic monitoring led to complications in only 2.8 percent of the cases [3-5]. A specific problem emerges when dealing with overextended material in the periapical region of a determined tooth. Such incident brings about symptoms associated with mechanical, sometimes thermal, biochemical and biological agents. The aim of this case report was to describe a case of overextended gutta-percha in tooth 21 which reached the nasal cavity and caused running secretion from a nostril associated with pain and swelling.

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## 2. Literature Review

It is unquestionable in Endodontics the fact that the root canal system anatomy plays a fundamental role in the rates of success and failure. Some of the major problems is the multiplicity of canals and accentuated curvatures [6-8]. There has been a great increase in the number of endodontic retreatments in the last few years; and this is partly due to the growing number of unsatisfactory treatments and the consequent growing number of specialists in the endodontic field, which reflects the difficulty in treating the root canals. This happens not only because of their varying numbers according to the teeth group, but also due to their varying trajects which lead to the periodontal ligament (PDL), and such terminal points may happen apically or laterally, often with multiple portals of exits Schilder [9].

Many facts may contribute to endodontic failures; some of which can be attributed to anatomical features in the very teeth, and others due to the professional's ability in shaping, cleaning and obturating the system [9-12]. One way or another, iatrogenic situations are often found in routine endodontic examinations, and, in spite of the many causes of failure, bacterial contamination continuous to be the most pertinent one, [13, 14]. Together, bacterial contamination and technical difficulties contribute to this growing number of unsatisfactory endodontic outcomes. For a better understanding of this situation, a study was conducted by Lin *et al.*, who evaluated 236 cases of endodontic treatment failures. They found a correlation between the presence of bacterial infection within the root canals and periradicular lesions in endodontic failures [15].

Apart from contamination, there are some situations often found in routine endodontic clinics that can indeed be pointed as responsible for failures, namely: inadequate filling of the canal; overextensions of endodontic materials; inadequate coronal sealing allowing infiltration; untreated root canals; instrumentation complications like lacerations, perforations as well as instrument fractures. Certain groups of teeth are usually regarded as more difficult to be endodontically treated, and therefore more prone to cause iatrogenic incidents. Among them, molars are the ones which require more technical abilities from the endodontists, firstly because of their multiplicity, frequent curved trajects and communicating canals. Nevertheless, central incisors are the teeth that are regarded as the less requiring technically, due to their single root canal, usually straight and ample, showing no real difficulties for root canal therapy [13]. The aim of this paper was to report a case of overextended obturation in tooth 21 whose gutta-percha reached the left nostril and was successfully retreated.

## 3. Case Report

A 29-year-old Caucasian patient came up to our surgery office complaining about a swelling associated with a running purulent secretion coming from her left nostril. Darkening was present in the crown of tooth 21 and the anamnesis revealed that she had that tooth endodontically treated thirteen years before the dental appointment, apparently caused by a trauma applied directly over tooth 21 as a consequence of a fall. However, only three years ago did she notice a swelling on the left side of her face, which was interpreted by the same dentist who treated her as a dental abscess possibly caused by tooth 11, which had not been treated. He prescribed antibiotics based on penicillin which made the swelling disappear. The radiographic examination showed the following situation.

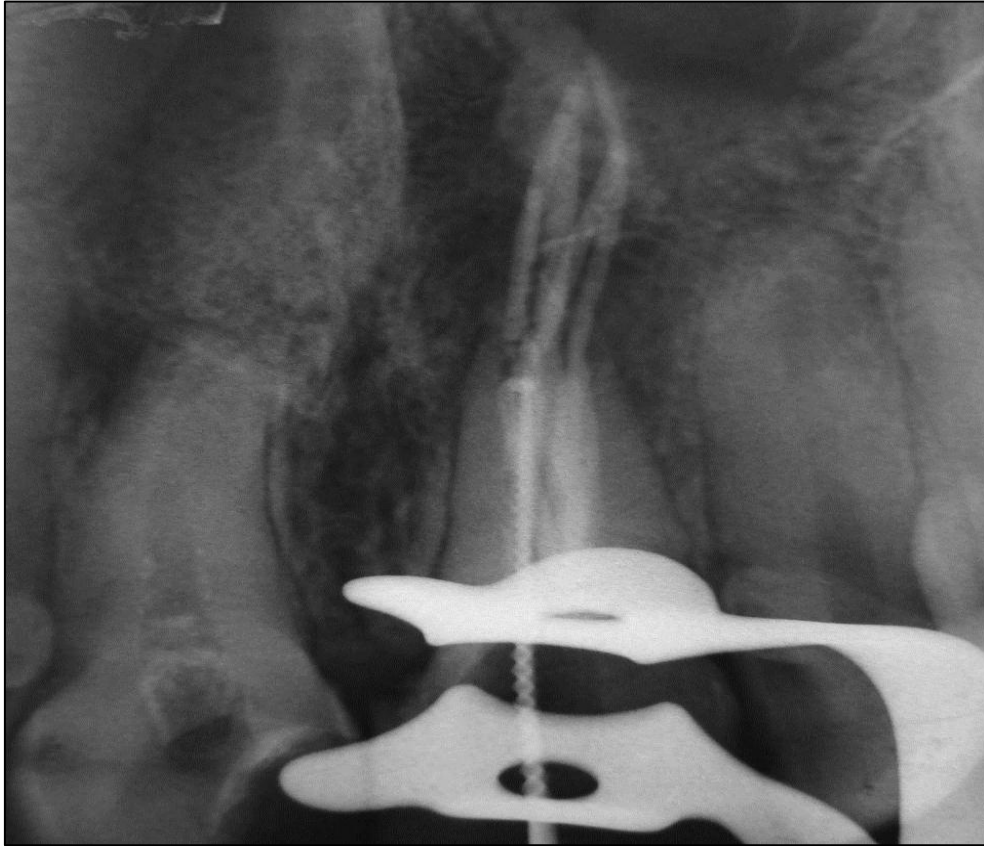
Figure-1.



Periapical radiograph showing overextended gutta-percha which reached the left nostril of the patient.

Tooth 21 showed a great amount of gutta-percha overextended from the root canal. The patient was in pain to vertical and horizontal percussions. No edema was present, but there was a fistule on the base of the nasal cavity, particularly compromising the left nostril. The diagnose was defined as chronic abscess and a non-surgical approach was chosen as the best treatment.

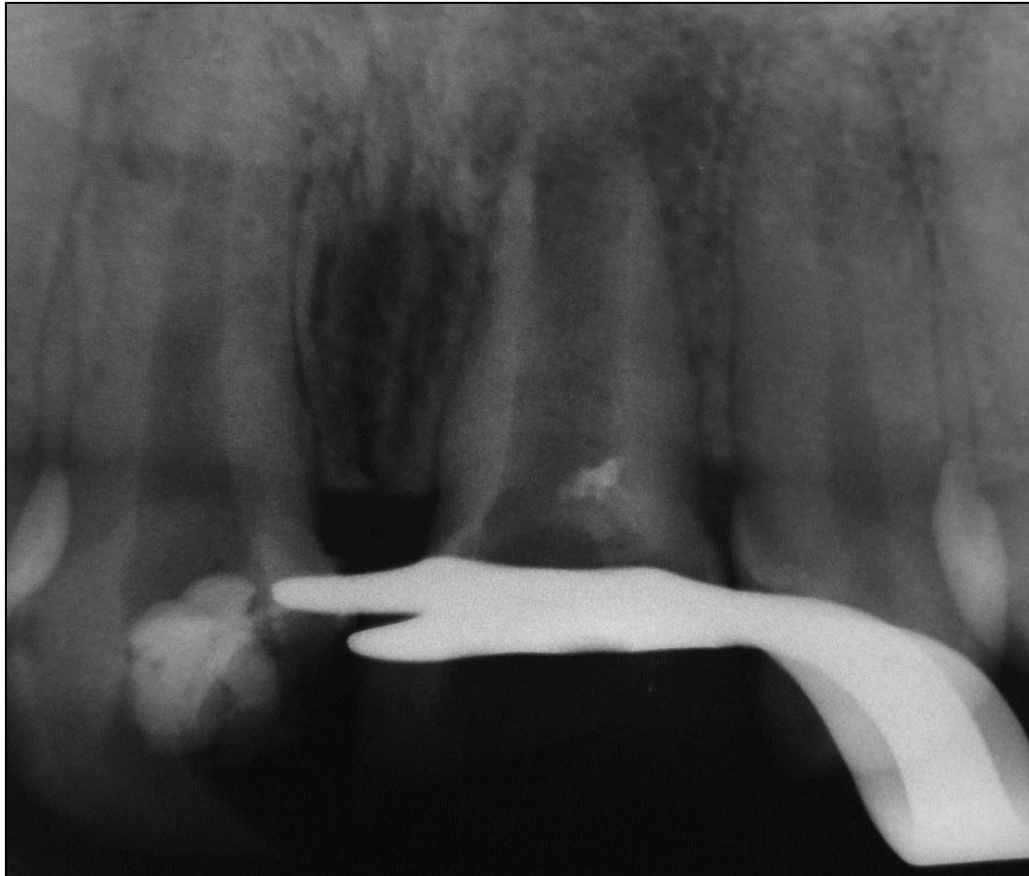
**Figure-2.**



Non-surgical endodontic retreatment. Gutta-percha being removed from the root canal of tooth 21

The gutta-percha removal was accomplished carefully with an 80 Hedstrom file using orange oil as a solvent. It was necessary to accomplish foraminal transpass in order to remove all the material from the periapical region. The initial irrigation was made using 2,5 sodium hypochlorite and finalized with calcium hydroxide water, in order to enhance healing.

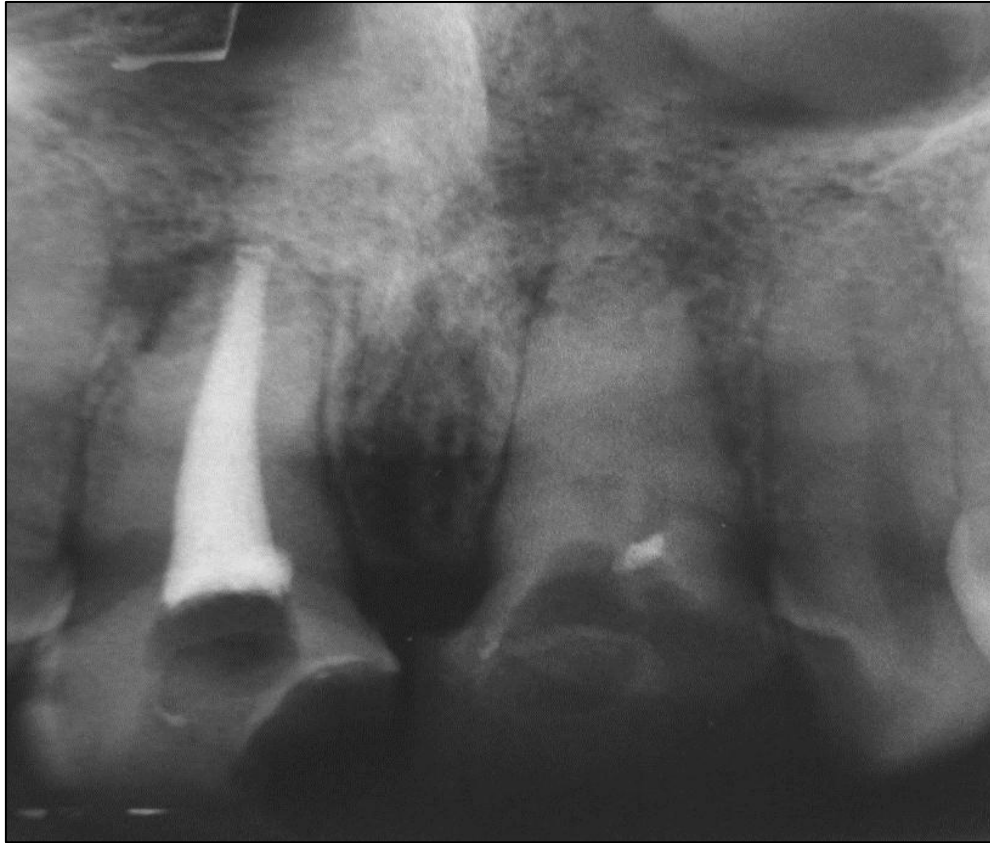
**Figure-3.**



Gutta-percha removal and cleansing of the root canal

Due to intense bleeding, intracanal medication in the first session was made with P.A. calcium hydroxide paste obliterating the whole length of the canal.

**Figure-4.**



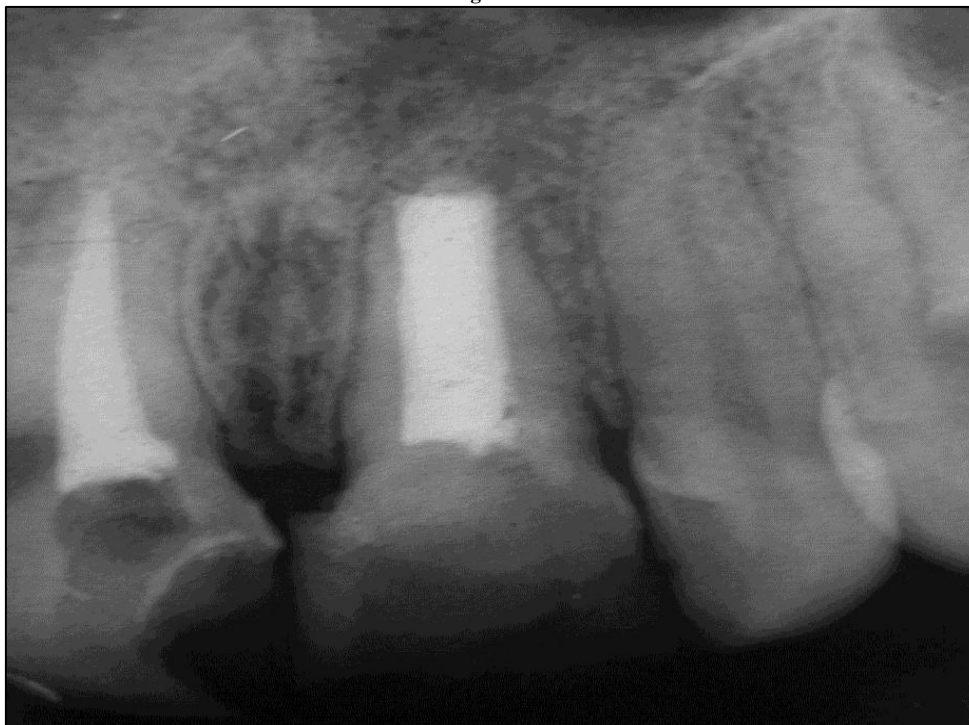
Intracanal medication accomplished with P.A. calcium hydroxide in the first session.

The second session was accomplished one week later. The elimination of the purulent secretion was noticed, and the pain to vertical and horizontal percussion was lessened. The calcium hydroxide paste was replaced by Calen, where it remained for a month. The third session took place 30 days later.

**Figure-5.**



Figure-6.



One year preservation

#### 4. Discussion

Endodontic failures are often a reason for frustration for patients as well as for endodontists. The best definition for endodontic retreatment is a procedure performed on a tooth that has received prior attempted definitive treatment resulting in a condition requiring further endodontic treatment to achieve success [16]. It is only expectable that teeth with overextended plastic and solid material pushed against the periapical region undergo some sort of inflammation, which is often accompanied by infection. In this case, fistula was present in the nasal cavity with purulent secretion from the left nostril. There are differences concerning treatment planning choices depending on the background of the professional, clinical experience and of course the costs of the procedures [17]. In this work it was decided to apply non surgical procedures firstly because of root preservation, because the surgical approach might jeopardize the already fragile root, and secondly because it is indeed less expensive and less traumatic for the patient.

One thing to keep in mind is the professional conduct during endodontic treatment. The root canal not only needs to be carefully treated. The basic steps must be taken to assure that the gutta-percha cone is well adapted in the apical end of the working length. That is why conometry must be accomplished. Accessory gutta-percha points need to be compacted laterally to the principal point, in order to avoid their overextension. None of these steps were followed in the previous treatment of the patient in this case report, and therefore an iatrogenic situation forced the patient to search for endodontic assistance for the second time.

Anatomy does play a significant role in the endodontic therapy, and sometimes it may indeed influence in the final outcome of the treatment. However, in the case presented, there was no technical obstacle to accomplish the obturation. It is a fact that apical thin walls may fragilize the dental root during mastication, and that the apical closure is the most desirable and expectable outcome in modern endodontics. Nevertheless, one thing to take in consideration is the patient's social condition when searching for endodontic treatments in Brazil. Most of the dental surgery offices supported by the government usually do not have all the necessary materials and equipment for the actual up to date treatments, and therefore that was the only treatment possible to be offered in that moment. After one year preservation, the tooth showed periapical healing was in appropriate conditions, and most of all; the patient was satisfied with the final outcome.

#### 5. Conclusions

Although central incisors are the less technical requiring group of teeth for endodontic treatment, sometimes the undergo iatrogenic complications. The due retreatment therapy following the basic endodontic steps are fundamental for the proper reestablishment of tooth to play its physiological role in mastication, aesthetics and phonation.

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