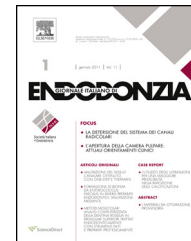




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CASE REPORT/CASO CLINICO

# Endodontic retreatment of maxillary first molar: the importance of the fourth canal



*Ritrattamento endodontico di un primo molare superiore: l'importanza del quarto canale*

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Received 31 December 2015; accepted 20 March 2016  
Available online 28 April 2016

## KEYWORDS

Endodontic retreatment;  
Operative microscope;  
MB2;  
Ultrasonic tips;  
Maxillary first molar.

## Abstract

**Aim:** The targets of the endodontic therapy are damaged tissue and bacteria removal from the canals and dentinal tubules and the prevention of recontamination after the treatment.

**Introduction:** Correct endodontic treatment has to follow several parameters: proper diagnosis, isolation of operating field, full chemo-mechanical preparation of the complex endodontic system, three-dimensional obturation of the root canals, post endodontic restoration. Respecting all these parameters short and long term success can be achieved.

**Materials and methods:** In this article an orthograde retreatment of maxillary first molar has been described, which showed at pre-operative X-ray, an incongruous endodontic therapy, the failed finding of the fourth canal and the presence of periapical lesions.

**Discussion:** A high percentage of failures is due to missed root canals and therefore not cleansed, shaped and it is essential to use modern technologies to achieve safe and reproducible results.

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Peer review under responsibility of Società Italiana di Endodonzia.



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<http://dx.doi.org/10.1016/j.gien.2016.03.001>

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**PAROLE CHIAVE**

Ritrattamento endodontico;  
Microscopio operatorio;  
MB2;  
Punte ultrasoniche;  
Primo molare mascellare.

**Conclusions:** The endodontic retreatment of this right maxillary first molar was performed with the proper protocols and sophisticated tools, with which we can achieve success in the short- and long-term treatments.

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**Riassunto**

**Obiettivo:** La rimozione dei tessuti danneggiati, eliminazione dei batteri presenti nei canali e nei tubuli dentinali e la prevenzione della ricontaminazione post-trattamento sono gli obiettivi della terapia endodontica.

**Introduzione:** Un trattamento endodontico per definirsi corretto deve rispettare diversi parametri: corretta diagnosi, isolamento del campo operatorio, la più completa possibile preparazione chemio-meccanica del complesso e completo sistema endodontico, otturazione tridimensionale dei canali radicolari, restauro post-endodontico. Rispettando tutti questi parametri è possibile ottenere un successo a breve e lungo termine.

**Materiali e metodi:** In questo articolo viene descritto un ritrattamento ortograde di un primo molare superiore, il quale presentava, attraverso radiografia pre-operatoria, una incongrua terapia endodontica, il mancato reperimento del IV canale e lesioni periapicali.

**Discussione:** Sicuramente una percentuale abbastanza significativa di insuccessi è da attribuire a canali radicolari non individuati e quindi non detersi, sagomati ed otturati.

Oltre ad un adeguata conoscenza dell'anatomia dei denti che trattiamo è fondamentale usufruire delle moderne tecnologie per ottenere risultati sicuri e riproducibili.

**Conclusioni:** Il ritrattamento endodontico di questo primo molare superiore di destra è stato eseguito con i dovuti protocolli e con strumenti sofisticati, i quali hanno permesso di ottenere il successo a breve e lungo termine.

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**Introduction**

One of the major causes of failure in endodontic treatment is the impossibility of locating and treating the entire root canal system, a result of the lack of knowledge regarding the dental, internal or external anatomy<sup>1,2</sup> and the high complexity and variation of the root canal system, with accessory, secondary, recurrent, and apical delta canals, among others.<sup>3,4</sup>

Maxillary molars are the teeth that contain the greatest number of roots, with diverse shapes and formations, which is why their internal canal system is so variable.<sup>5,6</sup>

Various studies have shown large differences in the detection of the MB2 canal in the maxillary second molar according to the technique used; in in vitro studies it varies between 29% and 100%<sup>7,8</sup> whereas in vivo studies report between 19.7% and 51.1%.<sup>9,10</sup>

Traditionally, most endodontic canal detection procedures have relied on the dentist's tactile dexterity, and mental image of the canal system because the ability to visualize the canal orifices is severely restricted.<sup>11–13</sup> By magnifying and illuminating the grooves in the pulpal floor and differentiating the color differences between the dentine of the floor<sup>14</sup> and walls the operating microscope, has made canal location easier.<sup>15,16</sup>

Using magnification during endodontic treatment has particular advantages. It increases the confidence level of the operator by improving control during troughing and searching in the deep chambers of maxillary molars thereby reducing significant risk of perforations.<sup>17</sup> Moreover, magnification

further enhances the ability of the operator to effectively search for the second mesiobuccal canal and as a result leads to higher number of such canals being located and treated.<sup>14,18,19</sup>

The target of endodontic therapy consists in adequate shaping, proper cleansing followed by a correct obturation of the complex system of root canals with thermoplastic gutta-percha.<sup>20–22</sup>

The manual and mechanical files do not have a complete contact with the endodontic surface; for this reason after the shaping step, more time to the cleansing phase has to be applied.<sup>23</sup> Through the modern techniques of three-dimensional cleansing all the endodontic spaces can be achieved.<sup>24,25</sup>

Even if a complete bacteria removal is not achieved, it will be too low to allow the defense system action to proceed to healing and then get the success in short and long term.<sup>26,27</sup>

A significant percentage of failures are because of the presence of not shaped, not cleansed and obtured pulp tissue.<sup>28,29</sup>

Thanks to the knowledge of the endodontic anatomy and its possible variants associated with the use of modern technologies, it is possible to find the root canals and achieve a greater control of all the phases.

**Materials and methods**

A fifty-five-year old patient was referred to our Department complaining of pain in chewing at tooth 2.6. X-ray exam obtained through the paralleling technique, showed

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