

Moisture Control in Endodontic Microsurgery: A Technical Note

Noriaki Aoki^{1*}, Chika Koyama¹, Yasufumi Kosugi², Hiroki Miyagishima³, Keita Ishiguro³, Shinsuke Ohta³

¹Department of Oral and Maxillofacial Surgery, Saiseikai Yokohama City Nanbu Hospital, Japan

²Department of Oral and Maxillofacial Surgery, Yokohama City University Graduate School of Medicine Yokohama, Japan

³Department of Oral and Maxillofacial Surgery, Sakae kyousai Hospital Japan

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*Corresponding author: Noriaki Aoki

Abstract

Original Research Article

Moisture control is a major problem during endodontic microsurgery. We describe a previously unreported technique involving the use of a simple and inexpensive modified needle to improve moisture control in endodontic microsurgery.

Keywords: endodontic microsurgery, moisture control, retrograde filling, root-end preparation, radicular cyst.

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INTRODUCTION

Moisture control is a major problem during endodontic microsurgery. A dry operating field is necessary for good visualization and to maintain an ideal environment for the placement of the retrograde filling material.

Inadequate visibility resulting from continuous bleeding in the operative site is frustrating for the surgeon and may result in prolonged surgery and failed cases.

Regardless of the type of retrograde filling material used for sealing the root apex, obtaining a dry and clean operative field is essential to success in endodontic microsurgery.

We describe a previously unreported technique involving the use of a simple and inexpensive modified needle to improve moisture control in endodontic microsurgery.

Technique

We use a 25 mm long, 25G blunt needle (NISHIKA syringe[®] Flex 5 Co. Ltd Japan) and bend it into an L-shape at the end, so that it can be deeply inserted into the apex of the root (Fig.1). The L-shaped and blunt tip allows the needle to be inserted smoothly into the narrow root canal. Subsequently it is connected to an air syringe in the outpatient clinic, or it can be connected to the air compressor through an extension tube (SF-ET 1030L 100cm 1.0ml[®] TERUMO) in the operating room.

After elevation of the flap and curettage of the lesion, the apex of the tooth to be filled is isolated from the oozing derived from the apical lesion. Before the material is placed, the apex of the tooth must be made accessible and ready for the retrograde filling, and the operation field must be cleaned and dried. The root-end should be prepared to a depth of 3 mm into the apex of the root, preferably using an ultrasonic scaler power tip. The root-end preparation should be isolated from fluids and moisture including blood. A suitable hemostatic agent should be placed in the bone cavity, and the apex should be dried and cleaned with the L-shaped needle by deeply inserting it into the root canal from the root apex (Fig. 2). The root-end filling material should be placed in the root-end cavity with a small plugger to secure a dense filling. There should be no excess material on the resected root surface.

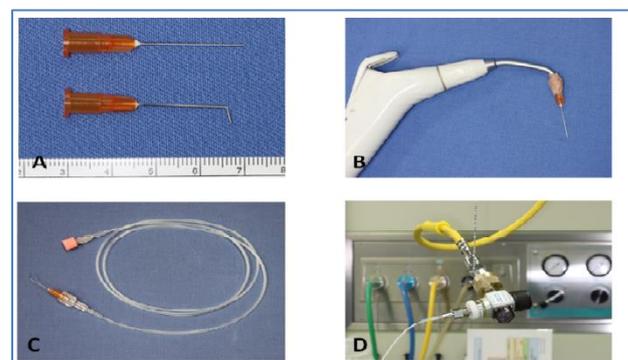


Fig-1

A. A 25mm long, 25G, blunt needle (NISHIKA syringe[®] Flex 5 Co.Ltd.Japan)

- B. A needle connected to air syringe which comes equipped with dental chair unit in the outpatient clinic.
 C. A needle connected to the extension tube.
 D. The extension tube connected to an air compressor comes equipped with the operation room.

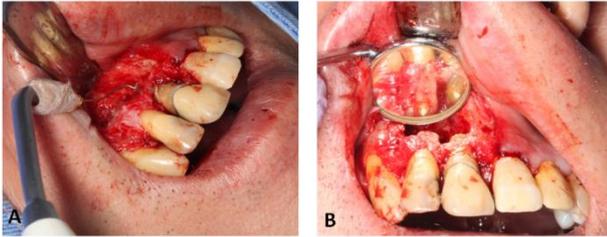


Fig-2

- A. L-shaped at the end, 25G needle deeply and smoothly inserted into narrow root canal. The apex of the root sprayed with an air to dry and clean.
 B. Placement of the retrograde filling material in endodontic microsurgery

DISCUSSION

The success of endodontic surgery depends on thorough removal of all necrotic tissue and complete sealing of the root canal. Recently, endodontic microsurgery has been used in the developing field of periradicular surgery, applying microscopy, modern ultrasonic preparation, and biocompatible retrograde filling materials [1, 2]. In conventional endodontic microsurgery, the root-end cavity is generally dried with the standard air syringe fitted to the dental chair unit in the outpatient clinic. However, it is impossible to achieve a completely dry and clean environment inside the apex of the root canal because the air syringe is too far from the apex of the root. This L-shaped modification of a 25G blunt needle can achieve completely dry and clean conditions inside the root canal because it is inserted 3 mm into the root apex, and directs high pressure air into the walls of the root canal. This technique is more effective than the conventional methods used.

Numerous procedures and agents for controlling hemorrhage have been described in the literature, including bone wax, vasoconstrictors, thrombin, calcium sulfate, and oxidized cellulose [2]. These agents can achieve hemostasis in a short time, are easy to use, are reliable and are the best option for these surgical procedures. When these techniques are used in combination with the L-shaped needle, the result is a dry field providing better visualization, an optimal environment for the placement of the retrograde filling material, and a more efficient surgical procedure with less blood.

Effective apical sealing in endodontic surgery requires the material to be inserted into a dry root-end

cavity. Recently, mineral trioxide aggregate (MTA) and ethoxy benzoic acid (super EBA) have been frequently used as a root-end filling material [2, 3]. MTA in particular has been reported to successfully seal the root-end cavity in apicoectomies. Up to now, many clinicians are available worldwide. Super EBA, which is a reinforced cement based on a eugenol mixture, is less influenced by moisture [4]. They reported in a study of failed clinical cases that the apex could not be effectively prepared and cleaned for filling with traditional surgical techniques. Root filling materials need to be inserted in a dry and clean environment to achieve durable sealing and infection control and to promote tissue regeneration [2, 3]. Moisture can be removed from the canal using the L-shaped needle air tip. Using dry compressed air and avoiding condensation around the material are essential to prevent deterioration of the material's hardness. As a result, it does not exceed the initial setting time of the material properties. Furthermore, contamination by various chemicals and infectious bacteria from the blood can be avoided by using dry compressed air from this needle.

The most promising outcome in endodontics is achieved by effective sealing of the root-end cavity after thorough curettage, allowing the periapical lesion to resolve and heal after microsurgery. In this way, a tooth with an apical lesion can be maintained and preserved for a long time. Effective apical sealing in endodontic surgery requires a dry and clean root-end cavity in which to insert the filling material. We conclude that use of an L-shaped, 25G blunt needle is an innovative, inexpensive, and easy-to-use technique to provide favorable conditions for the optimal placement of a root-end filling.

Patient consent

The patient signed a consent form.

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