More than just a long-lasting post – VDW’s Double Taper Shape preserves more dentin

By VDW

MUNICH, Germany: Improved dentin preservation and better aesthetics are two of the convincing advantages of VDW’s DT Posts. These are resulting from VDW’s Double Taper Shape design and quartz fiber technology: the key to a long-lasting endo-dontic treatment success.

For endodontically treated teeth with more than one missing dentin wall the placement of a post to maintain the coronal structure is strongly suggested. To place it properly it is key to retain as much dentin as possible while preparing the root canal beforehand. VDW’s DT Posts with Double Taper Shape preserve more dentin as the two-stage design corresponds optimally to the morphology of the prepared root canal. Thus, the dentist avoids unnecessary dentin removal to fit in the post.

Tooth protection and better aesthetics:

The DT Posts break-resistant quartz fiber material has advantageous mechanical characteristics. Its low modulus of elasticity distributes chewing forces correctly and minimizes the risk for root fractures. Thanks to the quartz fiber material’s transversality properties the patient benefits from better aesthetics.

Safe retention and easy post location:

VDW’s DT Posts allow more convincing features. The Safety Lock® coating ensures maximum bond properties and thus a safe long-standing retention of the post. The thermal reactive color pigments of VDW’s DT ILLUSION® X0® SL posts enable their location after the placement. Being barely visible at body temperature, they become clearly detectable after cooling below 29°C. Cleaning

Read more about VDW’s DT Posts at: https://www.vdw-dental.com/en/products/post-endo/

Success evaluation of N2 treated teeth with open apical foramen. A retrospective study

By Dr Annette Joschko, Dr Robert Tusewun & Prof. Jerome Rotgans, Germany

Abstract

55 teeth with open foramen were identified in a general dentist practice during the years 2015–2006. 75 of which could be followed-up X-ray after an average time of 70 months (follow-up X-ray). 40 teeth were subject to vital extirpation (VitE), 28 teeth to vital amputation (VitA), and seven teeth with necrotic pulp underwent conservative root canal treatment (RT). Apexitis success rate amounted to 85.3% (VitE 92.9%, VitA 85.7%, non-vital RT 97.6%). Another 12% could be judged as partial success in molars, as a certain number of the molar roots showed apexitis, however, others not yet. The percentaged difference of a successful apexitis between vitally extirpated and non-vital teeth was significant (p = 0.059).

Introduction

Endodontic treatment of teeth with incomplete root growth poses a special challenge. In young patients, the necessity for endodontic treatment results from an accident or profound caries. Aside from damage control, this treatment aims at promoting tooth maturation including narrowing respectively closure of the apical foramen (apexitis) and possibly root extension (apexitisogenesis). According to Zehlow (1997) the following treatment options are commonly used:

- For vital teeth: Pulpotomy (VitA) with subsequent conservative root canal treatment (RT)
- For non-vital teeth: – either RT or – RT in connection with apicectomysurgery root canal filling – or inducing of bleeding with root canal filling in the coronal root part only.

Krawoke et al. (1997) disapprove of a VIT inevitably following root canal filling. Joschko (2002) points out that the often diverging roots of immature teeth exclude a dense root canal filling, and that open apical foramen promotes overfilling. Some authors, like Kornilassal et al. (2003) and Haft et al. (2005), state that the dental papilla may simulate an apicodistal tissue in the area of the open apical fora-

Materials and method

95 endodontic treatments of teeth with open apical foramen were taken into consideration. These were followed up after a control period of at least 12 months (up to 36) 65% of apical lesions were completely healed and an apical bar could be observed in 31 cases (26%). 78.7% were free from apical periodontitis, whereas apexitis took place in only 16 out of 75 cases (21.3%). The time period for control of apical development was clearly longer, though, amounting to 70 months.

Aside from the therapy with various medicaments, the ‘revascularization’ therapy was established also (Hann et al. 1972, Hillemann et al. 2008, Bae et al. 2009, Cohen et al. 2002, Garcia-Godoy and Murray 2014) provoking a light bleeding into the pulp by puncturing the apexes. A dressing placed coronary. MTA, calcium hydroxide, formocresol or a triple antibiotic paste. The latter one provided thicker canal walls than calcium hydroxide respectively formocresol. Also the length growth was stronger versus MTA application (Bleeselder 2004).

Based on the knowledge that formaldehyde preparations have a similar (repopulating, osteogenic) effect to the pulp like calcium hydroxide, the secondary author of this study as long-time owner of a general dental practice suggested an analysis of his endodontic treatment cases with open apical foramen regarding apexitisogenesis, which had been carried out by Joschko (2010) as then doctoral candidate from which this article reports.

Fig. 1: Probability of survival of the 3 therapy groups with the target criterion ‘No Extraction’

Fig. 2: Time history of the extractions (N = 118)
from the files of the practice examined in this study in the years 1985 through 2006. Treatment method was the so-called N2 method according to Sargenti and Richter(1954), which meant: no canal rinsing and application of the paraformaldehyde containing N2. Rubberdam was not used. The N2 powder contained 7% formaldehyde before admission by the EU, afterwards the content was decreased to 5%.

Four cases were excluded:
- A non-vital case where the initial X-ray did not clearly reveal whether the apical radio-opacity of both roots were a matter of apical periodontitis or apical papilla.
- A VitA case was extracted also loco a few days up to 18 months after VitA.
- X-ray was insufficient in the third case, VitE of an upper molar.
- In the fourth case, the patient did not show up again after devitalization of an upper premolar.

Thus, 95 cases to be judged remained, of which only two non-vital teeth were treated in a two-stage therapy. 93 cases were treated in one appointment, inclusive definite filling. For root canal filling, the N2 powder was mixed with N2 liquid to a creamy texture, a harder consistency was needed for VitA. N2 application for root canal filling was done by lentulo, for VitA a carrier instrument was used to bring the material into the excavated pulp cavity up to 1–2 mm into the canal access.

The 95 anonymous made cases were clinically followed-up without recall at an average of 73 months after treatment. 75 cases underwent X-ray control (follow-up X-ray) after an average of 70 months; 49 cases as single-tooth X-ray in parallel technique and 11 cases as orthopantomogram. Judged as endodontic failure were: pain or fistula at treated tooth, development of apical periodontitis, lingering or newly developed apical periodontitis.

Treatment success of the 75 cases was analysed in two modes considering the questions:
- Did apicification/apexogenesis occur?
- Did the apex remain unaffected of apical periodontitis?

In multi-rooted teeth with different apical diagnosis, the worst diagnosis was assumed as being valid for the tooth. A double magnifier served as diagnostic aid. Three persons evaluated the X-rays independently from each other. The doctoral candidate (author AJ), a dentist with ten years of professional experience and the practice owner (author RT). The final diagnosis resulted from the consensus of the three ratings.

Statistic significance was assumed for an error assumption of p < 0.05 for comparison of two parameters and calculated by means of the logrank test.

Result
The average age of the patients was 10.7 years (6–25). Most cases (N=54) were attributed to mandibular molars (72%), among these mostly the first lower molars with 48 cases (90.5% of the cases to be analyzed), followed by maxillary incisors. 75 cases were subject to one or—in intervals—multiple follow-up X-rays. 40 teeth (41.1%) were extracted vitally, 28 teeth (29%) were amputated vitally and seven non-vital teeth (7.3%) underwent conservative endodontic treatment. Post-endodontic clinical control averaged at 73 months (22–271), the follow-up X-rays to be evaluated at 70 months (0–228). In 41 cases, X-ray evaluation was done more than 48 months after endodontic therapy.
The longer therapy dated back, the easier it was to treat, as apex or root formation of the teeth became evident during the observation period. For lack of previous X-rays, the application of a clinical examination and patients’ consent allowed a clinical control of the respective teeth as a whole. An inter pretation bias in this study was not noticed in any of the compared groups. This relatively methodical study had to be performed due to the natural way without external factors. One problem of long-term calcium hydroxide dressings would be an alteration of the mechanical dentine characteristics, which could lead to fractures. Long-term studies regarding MTAs would be missing. However, for achieving apatite formation, the calcium phosphate aggregate would be more effective than calcium hydroxide.

Also regarding regenerative approaches, only case studies and case series would exist. The blood clot generated during this therapy should however have no contact to the infected tears, as tears were not bio-compatible and featured a cell-toxic effect.

In the present study, pulp tissue, possibly blood as well, had contact to the cell toxic N2. As the long-term observation showed, this contact had no disadvantageous effect to the respective teeth. Regarding apatite formation and apatite genesis, a perennial study rather proved that the success rate was at least equal to MTA and calcium hydroxide. Root fracture, as suspected in calcium hydroxide cases, could not have been noticed in any of the cases. One-stage treatment has to be considered as special advantage of N2: application aiming at apexification, which at the same time is a cost-saving method.

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Case 2: Male (born 28 December 1980): Tooth 14

The authors Simon et al. (2007) observed 47 single-rooted teeth with 34 months. They stated a complete healing in 65%, an incomplete healing in 30% and an ‘apical closure’ in 25% of those cases (N = 63). The radiographic diagnosis of the present study is 98% positively without apical periodontitis, 93% with apical periodontitis questionable, 2% with apical periodontitis with 85% featuring ‘apical closure’ and 9% apical root closure. However, a direct comparison between the Simon and the present study is not admissible due to the low number of cases, the different observation periods and the non-coordinated interpretations of the evaluation modalities.

Il Meyle et al. (2006) examined 30 pulpotomy cases (25CaF2, 5 MTA) of which four were first molars, which suggests a comparison with our present cases. The following assumptions were applied: no clinical problems, radiographically no apical periodontitis or incomplete closure of the periodontal space, no periapical radiolucencies could not have been visualized with conservative root canal treatment and 6% with RCF. Despite of the diagnostic deficits to be assumed, X-ray in combination with a clinical examination remains the only practical method. An inter pretation bias in this study was not noticed in any of the compared groups. This relatively methodical study had to be performed due to the natural way without external factors. One problem of long-term calcium hydroxide dressings would be an alteration of the mechanical dentine characteristics, which could lead to fractures. Long-term studies regarding MTAs would be missing. However, for achieving apatite formation, the calcium phosphate aggregate would be more effective than calcium hydroxide.

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