Single visit endodontic and direct restoration of inadequate treated mandibular molar: case report

Perawatan saluran akar kunjungan tunggal dan restorasi direk pada gigi molar rahang bawah yang telah dirawat secara tidak adekuat: laporan kasus

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ABSTRACT

Introduction: Single visit root canal treatment (RCT) versus the multiple visit RCT has been the subject of a long standing debate within the dentist. Some of the unresolved issues include differences in clinical outcomes, inadequate microbial control and pain. In other hand, patients have no time to come in many appointments. **Case**: A 19-year-old female patient came with a complaint of uncomfortable over her first left mandibular molar. There was composite restoration on occlusal aspect of the tooth with no mobility and swelling. Radiograph showed a filling material from the top of pulp chamber to the floor. There was no radiolucency appearences in the periapical. Patient has no medical compromised. **Case management**: The initial procedure was isolation using rubber dam. The access was opened while eliminated the filling material using endo access diamond bur. Determined working canal length using apex locator and confirmed with radiography. The cleaning and shaping was done with Protaper Next rotary files. The 2.5% sodium hypochlorite, 17% EDTA and 0.12% chlorhexidine being used for final irrigation. The three canals were obturated with guttapercha and resin-based sealer by single cone method. The endoresto treatment was finished with direct composite restoration. **Conclusion**: Single visit endodontic has been shown to be an effective treatment modality when compared with multiple visit therapy and it does not deviate from achieving the objectives of proper biomechanical preparation, debridement, shaping, disinfection and 3 dimensional obturation of root canal system and is more beneficial to the patient and dentist provided there is careful case selection and strict follow of standard endodontic protocols.

Keywords: single visit endodontic, pulp necrosis, direct restoration

ABSTRAK

Pendahuluan: Perawatan saluran akar (PSA) kunjungan tunggal atau PSA kunjungan jamak telah menjadi bahan perdebatan lama dalam komunitas dokter gigi. Beberapa masalah belum selesai termasuk perbedaan hasil klinis, kontrol mikroba yang tidak memadai dan rasa sakit. Di sisi lain, pasien tidak punya waktu untuk datang dalam banyak janji. **Kasus**: Seorang perempuan usia 19 tahun datang dengan keluhan tidak nyaman pada molar rahang bawah kiri pertamanya. Ada restorasi komposit pada oklusal, gigi tanpa mobilitas dan pembengkakan. Radiografi menunjukkan bahan pengisi dari puncak ke dasar ruang pulpa. Tidak ada gambaran radiolusen di periapikal. Pasien tidak memiliki gangguan medis. **Penatalaksanaan**: Prosedur awal adalah isolasi menggunakan *rubber dam*. Pembukaan akses dilakukan sambil menghilangkan bahan pengisi menggunakan *endo access diamond bur*. Panjang saluran kerja ditentukan menggunakan *apex locator* dan dikonfirmasi dengan radiografi. *Cleaning* dan *shaping* dilakukan dengan *rotary file* Protaper Next. Natrium hipoklorit 2,5%, EDTA 17% dan klorheksidin 0,12% digunakan untuk irigasi akhir. Tiga kanal diobturasi dengan guttapercha dan sealer berbasis resin dengan metode *single cone*. Perawatan endoresto selesai dengan restorasi komposit direk dalam kunjungan tunggal. **Simpulan**: Endodontik kunjungan tunggal terbukti menjadi modalitas perawatan yang efektif bila dibandingkan dengan kunjungan berulang dan tidak menyimpang dari tujuan persiapan biomekanik yang tepat, debridemen, pembentukan, desinfeksi, dan perolehan 3 dimensi dari sistem saluran akar dan lebih dari itu bermanfaat bagi pasien dan dokter gigi asalkan ada pemilihan kasus yang cermat dan mengikuti protokol endodontik standar.

Kata kunci: kunjungan tunggal endodontik, nekrosis pulpa, restorasi langsung

INTRODUCTION

Single-visit endodontic therapy is defined as 'the conservative non-surgical therapy of endodontically involved tooth consisting of complete biomechanical cleansing, shaping and obturation of the root canal system during one visit'.[1]

Since its introduction, single visit endodontics has been a form of focus of controversy. Some advocate that all root canal treatments to be done in one visit while others do not consider it even in case of vital pulp extirpation.[2] Some studies have reported statistically insignificant difference between single and multiple

visit endodontics in terms of survival, post-operative pain or flare-ups.[3] So, it depends only on the preference of the operator to adopt single or multiple RCT.[4]

The concept of a single-visit RCT was described as early as the 1880s. Thereafter, there were reports on immediate root filling describing the criteria for success based on the manner of mechanical cleaning and the method of removing the bacterial origins from the canal system. The treatment techniques used at that time were very primitive, and the success rate of single-visit RCT was low. The single-visit RCT was bought back in the 1950s by Ferranti, who advocated the use of diathermy for pulp disinfection and hydrogen peroxide for irrigation. This treatment differed significantly from today's techniques. However, Ferranti was able to describe how the most important criteria for achieving successful results were, in fact, the proper shaping and cleaning of the canals. Currently, these principles are still applied, as important criteria, prior to consideration of single-visit treatment. In 1970, Tosti reported a satisfactory result in his clinical study using a single-visit approach, although the sample size of his study was small.[5]

Indications for single-visit endodontics are physically disabled patients who cannot come to dental clinics frequently, uncomplicated vital teeth, fractured teeth where esthetics is the concern, teeth with accidental/mechanical pulp exposure, intentional RCT, vital pulp exposures due to caries or trauma with symptomatic pulpitis, non vital teeth with sinus tract.[6-8]

Contraindications for single visit endodontics are severe pain on percussion suffering from acute apical periodontitis, teeth with anatomic anomalies for e.g. calcified and curved canals, acute alveolar abscess cases with pus discharge, unable to keep mouth open for long time for e.g. TMJ disorders, teeth with limited access, symptomatic non vital teeth and no sinus tract.[6-8]

Practice management advantages are single appointment treatment limits schedule interruption to replace lost or broken temporary restorations, same patients will pay a premium to save time, the risk of cancelled appointments is reduced, materials needed for separate visits like disposable bibs, suction tips, anaesthetic and irrigation needles and rubber dams are saved, medicolegal risk is reduced, the likelihood of cross contamination is minimized, time is saved: There is no need to neither reappoint patient nor reconfirm appointments; no need to greet patients, update medical history nor anaesthetize more than once; no need to customize instruments for patients, place rubber dam, remove temporary restorations, nor relearn patient's canal morphology etc.[6-8]

Patients advantages are patient comfort – as the number of visits are reduced; economic-extra cost of multiple visits, use of comparatively less chair side time, fewer materials all increase the economic to both patient as well as doctor; Reduced intra appointment pain: mid treatment flare ups which are usually caused by leakage of the temporary cements which would be reduced in single visit endodontic cases.[6-8]

CASE

A 19-year-old female patient came with a complaint of uncomfortable over her first left mandibular molar. The tooth had treated 3 years ago. Clinical examination (Figure 1) shows there was composite restoration on occlusal aspect of the tooth with no mobility and swelling with normal gingival. Radiograph showed a filling material from the top of pulp chamber to the floor. There was no radiolucency appearence in the periapical. Patient has no medical compromised.

The saliva test was performed for caries risks level. Hidration test was 25 seconds (green) with watery clear consistency of saliva (green). The pH test showed in range 6,8 – 7,8 (yellow), buffer test had 10 points (green). And saliva quantity test resulted more than 5ml/30 seconds (green). Finally, the tooth was diagnosed as necrosis of pulp with no periapical lesion. And then the tooth was planned for single visit endodontic treatment and diresct composite restoration as final restoration.

Figure 1 Initial clinical (left) and radiography (right) appearence

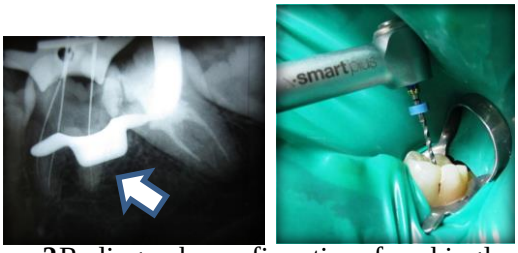

Figure 2 Radiography confirmation of working length (left) and canal preparation using rotary files (right).

MANAGEMENT

The initial procedure was isolation using rubber dam. Opening the access was done while eliminated the filling material using endo access diamond bur. Determined working canal length using apex locator and confirmed with radiography (Figure 2). The cleaning and shaping procedure was done using Protaper Next rotary files connected to endomotor, up to X3 for distal

and X2 for mesiobuccal-mesiolingual canals. With 2.5% sodium hypochlorite, 17% EDTA and 0.12% chlorhexidine being used for final irrigation and the Endoactivator agitation equipment. Trial gutta-percha was done (Figure 3). The canals were dried by paper points and then obturation procedure. The canals were obturated with gutta-percha point and resin based sealer by single cone method. Obturation was confirmed radiographically.

Figure 3 Trial gutta-percha point (left) and radiography confirmation of obturation (right)

The tooth was filled directly with resin composite layer by layer. Firstly, using bulkfill composite in the bottom of pulpal floor followed with dual shades resin composite (A3 Dentin and A2 Enamel). Finally, the restoration was polished with fine finishing bur, discs and polishing paste (Figure 4).

Figure 4 Direct composite restoration post single visit endodotic treatment

After 3 months of treatment, followed up the clinical and radiography of the treated tooth. There was no pain or uncomfortable. The gingival was normal, no food impaction and gap around the restoration (Figure 5). On radiography examination, there was no lesions and the canals were well obturated.

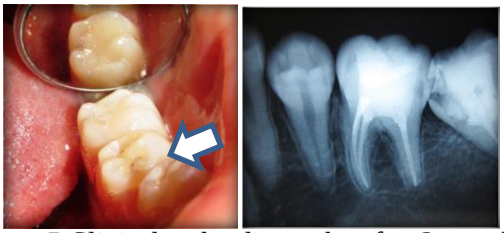

Figure 5 Clinical and radiography after 3 months

DISCUSSION

Endodontic treatment, or root canal treatment, entails removal of the dental pulp and the subsequent shaping, cleaning, and obturation of the root canals of a tooth. The key to endodontic success was described by Gutmann as the debridement and neutralization of any tissue, bacteria, or inflammatory products within the root canal system.[5]

According to the International Conference on Endodontics in 1958, there are ten important principles to be followed when a dentist performs endodontic treatment on the patient. First, endodontic treatment should be conducted using an aseptic technique. Second, the instruments should be confined to the root canal of the treated tooth. Third, the root canal should be prepared using fine and smooth instruments. Fourth, the root canal should be enlarged regardless of its original size, to enable the removal of contaminated dentinal debris and filling of the root canal. Fifth, the root canal should be copiously irrigated with an antiseptic solution during instrumentation. Sixth, the antiseptic irrigation or agents used should be nonirritating to the periapical tissues. Seventh, the sinus tract, if present, should subside after RCT and should not require surgical intervention (however, an incision of the soft tissue can be performed for cases of acute periapical abscess, to allow drainage). Eighth, the canal should be aptly shaped and hermetically obturated. Ninth, a negative culture should be obtained prior to obturation. Finally, the root canal filling should be biocompatible.[5]

The concept underlying single-visit techniques, as described by Oliet, is that there is no difference in the treatment criteria to ensure a successful result between multiple-visit and single-visit treatment. The criteria include an accurate diagnosis, proper case selection, and the use of contemporary endodontic techniques. Single-visit RCT is indicated when both operators and patients want to save chair side time and prefer that anesthetics be administered only once. Although the treatment can be finished in a single visit, all necessary procedures, such as biomechanical preparation, thorough cleaning, and disinfection, followed by complete obturation of the prepared root canals, should not be compromised. When the tooth is nonvital and there is acute inflammation, single-visit RCT should not be recommended.[5]

Single-visit endodontic treatment and multiple-endodontic treatment have their advantages and disadvantages. In general, many dentists considered the single-visit approach to be an alternative to a multiple-visit but have no trouble replacing it. The success of endodontic treatment should be based on careful case selection. There should be no shortcuts in any of the steps throughout the treatment procedures. Clinicians should evaluate their own clinical skills and the needs of the patient. Notwithstanding the

single-visit treatment approach, the clinicians should directly follow endodontic principles.[5]

In recent years, single-appointment endodontics has gained increased acceptance.[2-4] Recent studies have shown little or no difference in the quality of treatment or success rates between single and multiple visit root canal treatment.[4,9-11] However, Nair, et al found that 14 of 16 (88%) mandibular molars that were treated in a single-visit endodontic treatment harboured intracanal microorganisms immediately after completion of the treatment.[11]

On other hand, Rajesh et al. in their review of literature said that there is no significantly difference between single or mutiple visit endodontic. Statistically no significant difference was found. Multiple visit and single visit RCT demonstrated almost equal success but most important aspect for success in pulpectomy case is the indication of each case and its subsequent treatment, be it multiple or single visit RCT.[12]

Single visit endodontics has been shown to be an effective treatment modality when compared with multiple visit therapy and it does not deviate from achieving the objectives of proper biomechanical-preparation, debridement, shaping, disinfection and 3 dimensional obturation of root canal system and is more beneficial to the patient and dentist provided there is careful case selection and strict follow of standard endodontic protocols.

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