

Case Report: Overhanging Fillings in Restorative Dental Treatments and Endodontics

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Abstract: *Conservative dental treatments and endodontic treatments constitute a large portion of the operative professional practices of dentists. Operative dentistry involves risk of complication by its nature. However, inappropriate or careless approaches of dentists in some cases may result in undesired outcomes such as malpractice. One of the most frequently seen malpractices in conservative dentistry and endodontics is overhanging filling. Two cases are presented in this paper as examples to the clinical conditions overhanging fillings may lead to. Information was provided also on treatment processes and follow-up statuses of the patients.*

Keywords: Overhanging filling, localized periodontitis, radicular cyst, malpractice

1. Introduction

Overhanging fillings constitute a part of malpractice cases encountered in conservative dentistry and endodontics. We will discuss in this study the treatment approaches for two cases involving overhanging fillings from restorative and endodontic viewpoints.

While restorations closest to natural contours can be achieved owing to the innovations in the matrix systems in restorative dentistry, the detection of margin misalignments has also become easier with the widespread use of advanced diagnostic radiographies (1). Despite all these developments, overhanging margins of restorations still exist. The misaligned end margins at the places of connection of the tooth and the restoration affects periodontal health negatively. Moreover, a positive relationship has been reported between the degree of bone loss and overhanging margin (2). It becomes more difficult to remove an overhanging margin plaque of a tooth if it has a periodontal disease. Alongside misalignments of a restoration, the properties of the restorative material used are also associated with periodontal disease and advancing tooth decay (3). The treatment approach for repairing misaligned contours involves reconstruction of the unsatisfactory part of the restoration or renewal of the whole restoration (4).

Overhanging canal filling is the most commonly seen malpractice after a root canal treatment (5). Overhanging canal filling is the overlapping of gutta-percha or canal path with periapical tissue. Patient complaints disappear in a short time in the root canal fillings that were finished in an overhanging way using resorbing canal filling materials. However, non-resorbing filling materials may lead to various complications. The preparation of a root canal and the filling stages of it then become important for the success of the endodontic treatment. Correct determination of the root canal dimensions is the first step in endodontic success (6). Overhanging biomechanical preparation or overhanging filling affects the prognosis adversely. Some symptoms may

emerge in patients due to the overhanging material and the relationship of the treated tooth with anatomic formations. Besides the specified dimensions to be worked on, the ingredients of the material overhanging from the root canal system are also important for the severity of the clinical condition that may occur (5). Studies and case reports have pointed out that a part of the canal filling materials that overhang from the canal system fails to resorb and causes cystic formations, aspergillus infections, pain, swelling, paresthesia, or hypoesthesia in the neighboring anatomic regions (7).

2. Cases

2.1. Case 1:

Unsuccessful restoration of the tooth numbered 25 with OD cavity due to overhanging filling.

A 30-year-old female patient presented to our clinic with complaints including local pain, bleeding diathesis, and halitosis. Her intraoral and radiographic examinations revealed that the cause of her complaints was the OD amalgam restoration with overhanging contours in her upper left second premolar tooth (Figure 1).



Figure 1: Initial panoramic graphy to oral diagnosis

The overhanging amalgam restoration, which was not in alignment with the natural contours of the tooth and the periodontal tissues in the interproximal region, was thought

to result in periodontal complaints by causing plaque retention and foreign body reaction.

As a treatment approach, we decided to replace the overhanging contoured OD restoration with a composite restoration that is in alignment with the periodontal structures and has natural contours. While replacing the filling, pulp perforation occurred and its endodontic treatment was completed in the same session (Figure 2). The restoration above the canal was completed with a composite material (Spectrum TPH3, Dentsply Maillefer, Ballaigues, Switzerland) and a total-etch adhesive system (Prime & Bond NT, Dentsply Maillefer, Ballaigues, Switzerland). The polishing (OptiDisc, Kerr, Canada) procedure was completed in the same session (Figure 3).



Figure 2: Root Canal Treated Number 25

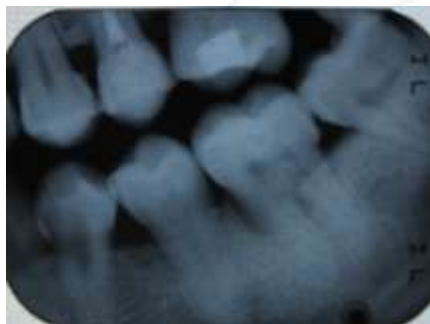


Figure 3: Natural Counteracted Coronal Restoration

During the 3-month follow-up of the patient, the composite restoration in alignment with the periodontal tissues was observed to enable protection of the patient's oral hygiene, resulting in the elimination of local periodontal complaints (Figure 4).



Figure 4: Oclusal View of The Coronal Restoration

2.2. Case 2

Unsuccessful treatment of a radicular cyst that occurred due to a trauma in the left maxilla, which affected the central, lateral, and canine tooth.

The anamnesis of a 15-year-old male patient who presented to the clinic complaining about a swelling at his left anterior maxillary region revealed that a swelling occurred at his left anterior maxillary region 3 years after he had suffered a trauma at the age of 9. He consulted a dentist due to this swelling and the dentist administered a canal treatment to his left maxillary central tooth. The radiological and clinical examinations we carried out in our clinic showed that there was an overhanging gutta-percha in his left maxillary central tooth and a radicular cyst affecting his central, lateral and canine tooth (Figure 5).



Figure 5: Initial Panoramic Radiography

Considering the etiology of the occurrence of a radicular cyst, we can hold responsible the assessment of post-traumatic symptoms without taking radiography and the overhanging canal filling material used in the treatment.

The treatment started with the removal of the overhanging gutta-percha, extirpation of the canine's pulps and biomechanical preparation of the effected 3 teeth. K- and H-type stainless steel canal files (Mani, Japan) were used. Sodium hypochlorite irrigation was performed after each filing procedure and calcium hydroxide dressings were done in 2-week periods until the surgical operation where cystectomy and apical resection were to be performed. Two months after starting the treatment, the canal fillings were completed using gutta-percha cones (Dia-Dent ML o29, Republic of Korea) and Endomethasone N (Septodont, France) by way of the lateral condensation of the canal path method.

After finishing the endodontic treatment, the cystectomy and apical resection procedures were applied and the teeth were apexified retrogradely with MTA (Proroot, Dentsply Maillefer, Ballaigues, Switzerland) (Figure 6).

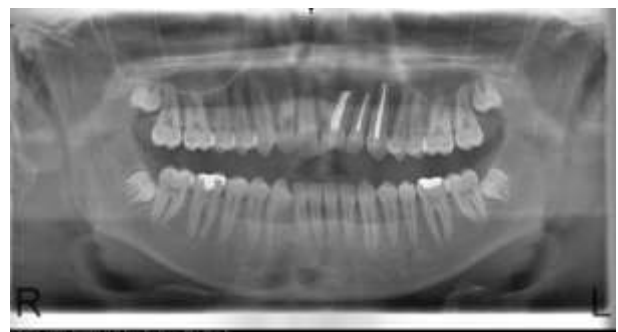


Figure 6: Control Panoramic Radiography after Cystectomy

During the 3-month follow-up after the operation, a reduction in the extraoral swelling of the patient and an increase in opacity indicating osseous recovery in the radiolucent area in the radiography were observed showing both clinical and radiographic remission (Figure 7).



Figure 7: Three-month Follow-up X-ray

3. Discussion

3.1 Case 1

Pain is an important physiological function for the organism (8). Pains originating in the inner mouth can be felt at other intraoral regions as well as at neighboring regions outside the mouth. Mostly originating from the pulp, pain may spread to the teeth or other regions, or just the opposite may occur; systemic diseases or soft tissue diseases may cause pain in the chin and even in the teeth (9). The cause of localized and moderate periodontitis is the overhanging filling edges or tooth decays that result in local plaque retention (10). Pack et al.⁴ detected 74% of all approximal overhanging fillings with the radiographic method and 62% of them clinically and reported that their knowledge suggested that both of these diagnostic methods should be used together. An anamnesis assessed without using radiography may lead to an error in the diagnosis of the dentist resulting in implementation of pulp-related procedures for the purpose of relieving pain. The clinical complaints of our patient indicated a localized periodontal ailment and the assessment of the panoramic x-ray taken during the initial examination showed an amalgam restoration with overhanging contours in the subgingival region.

Despite all the developments in restorative dentistry, it is a fact that restorations with overhanging contours are still being done and since these cannot always be detected and corrected, they turn into a cause of periodontal disease (11). An overhanging margin of a tooth with a periodontal disease makes the removal of the plaque difficult or even impossible. The substance used for restoration is quite

important in solving this type of a problem. Generally, renewal of a poor restoration is the best intervention, but if the overhang is at a minimal level and reachable, cheaper alternatives such as correcting the overhang or performing a marginal repair can be preferred. After assessing the magnitude of the overhang in the amalgam restoration, marginal misalignments and unaesthetic appearance of the tooth, it was decided to change the tooth color with a composite restoration. A secondary decay was detected during the treatment and pulp perforation occurred while the decay was being cleaned. For this reason, the composite restoration was performed directly after the canal treatment.

3.2. Case 2

The success of an endodontic treatment depends on various factors including correct diagnosis, proper entry to the root canal system, adequate biomechanical preparation, and obturation of the root canal system (12)(13)(14). It is understood from the patient's anamnesis that the necessary radiological and clinical examinations were not performed at the clinic to which he presented after the trauma.

Panoramic and periapical radiography is an important method in planning the dental treatment (15, 16). Two dimensional imaging methods have disadvantages such as lost details due to superposition and malocclusion. Panoramic x-ray, on the other hand, is an important imaging method in determining vertical bone level and diagnosing decays and periodontal diseases (17). Panoramic x-ray is the most widely used imaging method when routine clinical examinations are being performed (18). In this case where a diagnostic x-ray was not taken, endodontic treatment was applied under suboptimal conditions, to a tooth whose apexification did not materialize. The overhang of the gutta-percha used after an inappropriate biomechanical preparation could be clearly seen in the diagnostic panoramic x-ray taken in our clinic.

We decided on the treatment plan after vitalometric examinations of the teeth involved in the radicular cyst lesion and the teeth numbered 11, 12, and 13 were included in the treatment plan because they had necroses. There are evidences that, in the presence of irregular apical narrowing and broad periapical lesions, filling the roots, which were apexified hermetically using gutta-percha, with MTA retrogradely after cystectomy results in a more successful recovery (19). In this case, we performed cystectomy, apical resection, and retrograde MTA following the endodontic treatment of the teeth.

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