

INTRODUCTION

Restoration of anterior teeth using a conservative approach allows clinicians to provide porcelain laminate veneers with excellent esthetics without extensive tooth structure removal. Tooth preparation for porcelain veneers requires less tooth reduction compared to other restorative treatment options due to higher fracture strength when resin cement is bonded to enamel. Application of laminate veneers without making any preparations on the tooth has become a possibility with the improvements in the adhesive materials. Teeth with microdontia, abrasions, malpositions and diastemas can be restored successfully with “prepless” laminate veneers with the right treatment planning.^{1,2}

Ceramic laminate veneer restorations have advantages of bond strength to dental tissues, periodontal health, mechanical resistance and esthetics. On the other side they have disadvantages of requiring technical precision, not being repairable, having long chairside application time, not being able to mask underlying color when required, being brittle prior to cementation and not being economic.³

In these two case presentations, two patients were rehabilitated by ‘minimally invasive’ approach by their request. Lingually malpositioned teeth were restored with laminate veneer restorations.

CASE PRESENTATIONS

CASE-1

34-year-old female patient was concerned about her lingually malpositioned upper left lateral incisor and requested an esthetic restoration (Figure 1).



Figure 1: Case-1, initial situation.

Following clinical and radiological examinations different treatment options were discussed with the patient. Firstly, orthodontic treatment was recommended but the patient refused this option. As the patient was content with the appearance of other maxillary anterior teeth, it was decided to restore malpositioned lateral incisor with a laminate veneer without making any preparations. The introral factors of tooth like its position, occlusal relation, color, periodontal health and gingival biotype were evaluated. It was decided to apply no-prep laminate veneer procedure by using feldspathic blocks with a CAD/CAM system for the fabrication of the restoration.

After the selection of tooth color the impression was made using polyvinyl siloxane impression material (Express XT VPS, 3M ESPE, Seefeld, Germany). Laminate veneer restoration was fabricated in laboratory using CAD/CAM System (CEREC, Sirona Dental, Salzburg, Austria) from a feldspathic block (Vita Mark II, Vita Zahnfabrik, Bad Sackingen, Germany). Margins, occlusion and esthetic criteria were evaluated in the clinic and restoration was finished after characterization.

Due to good light transmission quality of feldspathic porcelain, a light curing resin cement (CHOICE 2, Bisco Inc., Schaumburg, IL, USA) was selected for luting the restoration.

Before cementation, a try-in paste was applied and translucent shade was found appropriate. 9.5 % Hydrofluoric acid was applied for 60 seconds onto the cementation surface of the restoration, rinsed with water and air-dried. Following the silane and bonding application the restoration was placed onto the tooth; the light curing was applied first on the lingual, then the labial side for 5 seconds. Excess cement was removed and completely cured by applying light for 20 seconds from all sides. (Figure 2)



Figure 2: Case-1, after cementation of prepress laminate veneer restoration on upper left lateral incisor.



Figure 3: Case-1, after 6 months.

The follow-up controls of the patient were carried out in 6 month (Figure 3) and 1 year (Figure 4) periods. No gingival problems were observed and the patient was satisfied with the esthetics and function.



Figure 4: Case-1, after 1 year.

CASE-2

26-year-old female patient applied to Istanbul University Faculty of Dentistry Prosthodontics Clinic for esthetic problems on her lingually malpositioned upper left canine. (Figure 5)



Figure 5: Case-2, initial situation.

Same with the other patient orthodontic treatment was recommended firstly, but the patient refused this option. As the patient was content with the appearance of her other maxillary anterior teeth, it was decided to restore malpositioned canine teeth with a laminate veneer without making preparation.

The same procedures with Case-1 were applied for the impression making and preparation of the restoration and the treatment was finished. (Figure 6)



Figure 6: Case-2, after cementation of prepress laminate veneer restoration on upper left canine.

The patient was called back at 6 month (Figure 7) and 1 year (Figure 8) periods. The restoration was observed as successful in terms of esthetics and function, and no gingival problems were observed.



Figure 7: Case-2, after 6 months.



Figure 8: Case-2, after 1 year.

DISCUSSION

The initial presentation of laminate veneer restorations suggested a no-prep approach and reported this as an advantage of the procedure.

However, this technique was abandoned due to restored teeth being too bulky and unnatural, resulting in esthetic concerns. A minimal preparation approach was found more successful and clinicians preferred it for a long time.⁴

In the last decade, minimal invasive procedures gained popularity and improvements in the materials used that made very thin laminate veneers a possibility. This resulted in no-prep laminate veneers to be considered as treatment options once again.⁵

However, applying laminate veneers without any preparations on the tooth is still a debated subject.⁶ Even though clinicians would like to restore teeth with minimal invasive techniques, especially when the reason is purely cosmetic, the survival and success of no-prep laminate veneers in long term, and health of soft tissues around these restorations are subjects of discussion in literature.⁷

Recent studies report good results in no-prep laminate veneer restorations if several conditions are met.⁸ Wells stated the following conditions for the success of no-prep laminate veneers:

- 1- Microdontia, for example tiny lateral incisors, irregularities in the width of the teeth and arch form,
- 2- Occlusal material loss due to abrasion, erosion or a combination of both,
- 3- Narrow dental arch and lingually malpositioned teeth in orthodontic premolar extraction cases,
- 4- Big lips and a wide smile, generally cases where there is enough space for the enlargement of the teeth.

In the current study no-prep laminate veneer restorations are planned and applied by taking

these points into consideration and selecting the right patients. CAD/CAM technique was preferred for a better marginal and internal fit compared to conventional fabrication procedures and homogeneity and mechanical stability advantages of ceramic blocks.⁹ Several different materials can be used in the CAD/CAM systems. In these cases, feldspathic ceramic blocks were used. These materials have 150 MPa fracture strength after adhesive cementation, their abrasion resistance similar to natural enamel, have good polishing properties and can be polished intraorally.¹⁰ Matsumura et al. reported several advantages of feldspathic ceramic; it can be successfully used in very thin layers, cost less than several other dental ceramic materials in the market, high mechanical resistance after etching with hydrofluoric acid and exceptional adhesion when used with the right adhesive system.¹

Cementation is one of the most important steps for the success of laminate veneers prepared with minimally invasive approach.¹¹⁻¹³ Adhesive resin cements are used for the cementation of laminate veneer restorations. Resin cements can be classified as self-curing, light-curing and dual curing; according to their polymerization methods. Self and dual curing resin cements include tertiary amines which may cause decolorization in time,^{14,15} for this reason light curing resin cements were preferred for the cementation of no-prep laminate veneer restorations in the current study. Also, the polymerization shrinkage occurs towards the light source, this was taken into consideration as the restorations were luted and the light curing was done from the lingual side first in order to lower decementation risk.

CONCLUSIONS

The no-prep laminate veneer restorations have been around more than two decades. Improvements of the materials and the adhesive techniques make these procedures on par with traditional laminate veneers. Minimally invasive approach is the greatest advantage of this procedure. It is a highly successful and esthetically pleasing treatment option if the right case is selected and the technique is carefully applied.

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CLINICAL AND RADIOLOGICAL EVALUATION OF THE PROBLEMS OCCURED DUE TO INAPPROPRIATE TREATMENT OF A PATIENT WITH ANTERIOR OPEN BITE: A MALPRACTICE CASE

DergiPark
AKADEMİK

Orhan AKSOY¹, Sercan KÜÇÜKKURT²

ABSTRACT

During practices in health care, patients could be seriously harmed by either conscious or unconscious wrong approaches of the clinicians. In this report, we discuss a malpractice case and the results of the malpractice on an adult female patient with anterior open bite.

A 23-year-old female patient was admitted to our hospital of faculty of dentistry complaint with anterior open bite and toothache. Patient history revealed that 2 years ago posterior teeth were shortened by a clinician without a prosthetic restoration until her anterior open bite disappeared. However not only the problem relapsed but also the shortened teeth needed root canal treatment which are also done by another clinician. Besides it has been learned that temporomandibular joint problems occur after these treatments. Thorough clinical and radiological examinations, it was decided that patient needs a multidisciplinary problems which must be solved together with departments of orthodontic, endodontics, restorative dentistry, prosthetic, oral and maxillofacial surgery and implantology. Indeed only an orthodontic and surgical treatment was generally enough to treat anterior open bite cases, as a result of malpractice this case get complicated which needs very complex treatments.

The treatment method performed by the clinician for treatment of anterior open bite, both ignored the morphological, functional, ethological facts of orthodontic treatments for such patients and also led to dental pain, damage and loss of function. This kind of an approach does not correspond with any ethical, scientific, or esthetical criteria.

Keywords: Malpractice, Anterior Open Bite, Orthodontic Treatment, Unappropriate treatment

ÖZET

Sağlıkla ilgili uygulamalarda hekimin bilinçli ya da bilinçsiz kusurlu yaklaşımları neticesinde hastalar ciddi şekilde zarar görebilmektedir. Bu olgu sunumunda bir ön açık kapanış vakasında diş hekimi tarafından yapılmış hatalı uygulamadan ve hastada neden olduğu sorunlardan bahsedilecektir.

23 yaşındaki kadın hasta, ön açık kapanış ve diş ağrısı şikayetiyle fakülte hastanemize başvurmuştur. Hastanın anamnezinden, 2 yıl önce ön açık kapanış şikayetiyle gittiği pratisyen diş hekimi tarafından posterior dişlerinin ön dişlerdeki açıklık kapanana kadar, herhangi bir protetik restorasyon yapılmaksızın vertikal yönde kısaltıldığı fakat zamanla bu açıklığın yeniden oluştuğu öğrenilmiştir. Ayrıca hasta, kron boyu kısaltılan dişlerinde ağrı oluştuğunu ve farklı bir hekim tarafından posterior dişlerine kanal tedavileri uygulandığını belirtmiştir. Hastanın temporomandibular eklem yönünden de yapılan tedaviler sonrası problemlerinin oluştuğu öğrenilmiştir. Hastanın yapılan klinik ve radyolojik tetkikleri sonrası hastaya ortodonti, endodonti, restoratif diş tedavisi, protez, ağız, diş çene cerrahisi ve implantoloji bölümlerinin müdahalesini gerektiren kapsamlı bir tedavi planı oluşturulmuştur. Normal şartlarda yalnızca ortodonti ve ağız, diş çene cerrahisi bölümlerinin yaklaşımlarıyla tedavi edilebilecek durumdaki hasta, uygulanan yanlış tedaviler sonrası oldukça karmaşık bir hal almıştır.

Hastanın ön açık kapanışının tedavisi için hekiminin tercih ettiği yöntem bu tip vakaların ortodontik tedavisinde göz önüne alınması gereken morfolojik, fonksiyonel, etiyolojik faktörler ve stabiliteyi göz ardı etmekle birlikte hastada dental ağrı, hasar ve fonksiyon kaybına yol açmıştır. Bu yaklaşım hiçbir şekilde diş hekimliğinin etik, bilimsel ve estetik kriterlerine uymamaktadır.

Anahtar Kelimeler: Malpraktis, Ön Açık Kapanış, Ortodontik Tedavi, Hekim hatası, Yanlış tedavi

¹ Istanbul Aydın University, Faculty of Dentistry, Department of Orthodontics

² Istanbul Aydın University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery

INTRODUCTION

Medical malpractice can be defined as the failure of a clinician to exercise the degree of care and skill that a physician or surgeon of the same medical specialty would use under similar circumstances¹. In our country, with the establishment of laws in recent years, favoring the protection of patient rights, this term has gained further importance and thus more legal regulations are getting into effect². In a survey conducted by Kandemir³, restorative dentistry was found to be the most common area where malpractice occurred (64%), followed by maxillofacial surgery (18%), prosthetic treatments (14%) and orthodontic treatments (3%). In this case report, we present a case with anterior open bite in which clinical malpractice was performed by a dentist.

CASE REPORT

A 23-year-old female patient was admitted to our faculty of dentistry hospital with the complaint of toothache and anterior open bite. Patient history revealed that the patient was admitted to a private dentistry clinic 2 years ago with the complaint of malocclusion, which constituted an aesthetical problem for the patient and caused difficulty biting. The clinician shortened the height of the crowns of the posterior teeth both in the maxilla and mandibula until their average height were 1-2 mm. However, not only the anterior open bite relapsed over time but also the posterior teeth had sensitivity and had positive percussion findings.

In the intraoral examination, the right upper canine and the first left upper molar teeth were not present, the right upper first molar and the left upper second molar teeth had amalgam

filling, and temporary restorations were observed in the left lower second premolar, the left lower first molar, the right lower first premolar, and the right lower second molar teeth. Angle type II molar relationship and posterior cross closure was seen on the right side and an anterior open bite of 5 mm was present (Fig. 1).



Figure 1. Intraoral images (A: Frontal, B: Right side, C: Left Side, D: Mandible, E: Maxilla)

The lower middle line was deviated to the right side for 2.5 mm although it was slightly corrected at maximum opening. The patient felt pain when she opened her mouth in the bilateral condylar area.

Radiological evaluation of the patient was performed with panoramic, lateral, cephalometric, and anteroposterior radiograms. In the panoramic radiogram, the right upper canine tooth was found to be embedded and to be in the vertical position. It was learned that the root treatment for the vertically shortened right lower first molar, left lower second premolar, left lower first and second molars, and right upper second molar was performed by another clinician. The right lower second molar was extirpated and the root treatment could not be performed.

Consultation from the orthodontics department was sought. In the orthodontic

examination, asymmetrical facial presentation was observed. The inferior tip of the jaw was deviated to the right. Occlusal cant was seen in the maxilla. The patient had a convex profile. The patient could not close her lips when the teeth were in occlusion, in the free position without muscular hyperactivity (Fig. 2).



Figure 2. Extraoral images

No pathological finding was observed in the maxillary sinuses. Asymmetry was seen between the right and left mandibulocondylar areas. While the right mandibulocondyle was in normal relationship with the glenoid fossa, the left mandibulocondyle was displaced to the inferior side. In the lateral cephalometric radiogram, a skeletal relationship of class II was found and the angle was discovered to be vertically high. Skeletal stricture was seen in the maxilla in anteroposterior radiogram and the tip of the mandibular jaw was deviated to the right (Fig. 3).



Figure 3. Orthopantomography and Cephalometric images

Magnetic resonance imaging (MRI) was utilized for better evaluation of the temporomandibular joint (TMJ). Anterior displacement without reduction in the right TMJ disc and subluxation of the right condyle and osteophytosis was observed. When the mouth tried to move to the open position, the condyle could only move a little forward. Anterior displacement of the left TMJ disc without complete reduction, subluxation of the condyle, and slight osteophytosis were observed. When the mouth tried to get into the open position, the condyle could only move to the lower posterior part of the temporal eminence (Fig. 4).

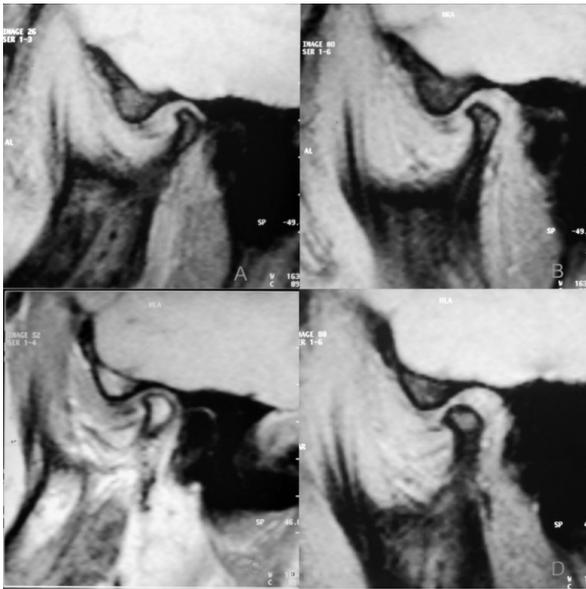


Figure 4. MRI of TMJ (A: Right - Open B: Right - Close C: Left - Closed D: Left - Open)

The patient was consulted with the Ear, Nose, and Throat (ENT) department for thorough evaluation of the skeletal and dental etiology of the open bite in terms of nasopharyngeal airway. In the clinical and radiological examination, hypertrophy in the right and left lower concae, and right septum deviation were detected. Medical treatment of the hypertrophy of the concae was followed by surgical treatment of the septum deviation. Current and/or future pathologies of the patient were evaluated in a multidisciplinary approach and the treatment plan was constructed accordingly. Symptomatic splint was prepared for the TMJ symptoms of the patients and the follow-up period was planned. Therapeutic position was decided to ensure the adaptation of the occlusion orthodontically and decompensation before orthognathic surgery. With the utilization of orthognathic surgery (Lefort 1 and/or bilateral sagittal split osteotomy), the skeletal and

dental relationships of TMJ were planned to be healed to the maximum level. The patient was informed about the treatment plan; however, the patient refused the treatment plan and was lost to follow-up.

DISCUSSION

Malocclusion of the anterior open bite may result from various etiologies caused by craniofacial, dentoalveolar, and soft tissue pathologies. The patients with this type of malocclusion constitute the most difficult cases for orthodontists⁴. Common characteristics seen in patients with skeletal open bite include posteriorly rotated mandibula⁵, increase in the vertical growth of posterior dentoalveolar structures^{6, 7}, shortness in the height of the posterior aspect of the face⁸, posterior rotation of the palatal plate⁹, increase in the height of anterior aspect of the face¹⁰, wideness in the distance between upper and lower lips¹⁰. The etiology of anterior open bite cases is not apparent, but they are considered to be multifactorial¹⁰. The changes in the structure of the muscles of mastication and the resting length of the tongue and its location are among these etiological factors. In these patients, the tongue rests between the upper and lower incisors during swallowing. Thumb licking and abnormal pressure habits in the tongue and lips, airway obstructions, and genetic skeletal developmental abnormalities may cause vertical malocclusion. The cornerstone of orthodontic treatment is the presence of normal, permanent, appropriate teeth and surrounding tissue structure. Precise establishment of the etiology of open bite increases the chance of successful treatment⁵. In these types of cases, early diagnosis and avoidance of harmful behavior with the help of growth may lead to healing without utilization of any treatment. In older cases, if the growth

is continuing, functional apparels including bite-block and bionator or orthopedic devices such as vertical jaw split could be used in treatment. In cases where the growth is completed, the treatment is planned based on the severity of the anomaly. Treatment options include a mask with fixed mechanics or orthognathic surgery⁵.

In the case presented in this study, denial of the sagittal, vertical and transverse problems and the treatment concepts by the dentist and the vertical shortening of the posterior teeth did not help the treatment of the patient. This approach also led to significant loss in the height of the crown of the teeth, resulting in TMJ damage. The approach used by the dentist did not follow any of the ethical, scientific, or aesthetic criteria of dentistry. It also ignored the basic morphological, functional, and etiological and stability principles of basic orthodontics.

CONCLUSIONS

The primary target of a dentist must be to preserve the tissues and organs of the patient and to preserve the enamel to aid the general wellbeing and aesthetic concerns of the patient. Prior to the treatment, all therapeutic methods must be evaluated through a wide perspective. When necessary, an interdisciplinary approach should be utilized, and the dentist should not only satisfy the aesthetic concerns of the patient but also consider the occlusive and functional aspects. Otherwise, as seen in the case presented, the interventions may harm the patient and the physician as well. Although there are legal regulations protecting the rights of the patients, the physician is responsible for protecting the body of the patient.

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