CASE REPORT

Diagnosis and esthetic functional rehabilitation of two patients with dental fluorosis: Case report

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Florozisli iki hastada tanı ve estetik fonksiyonel rehabilitasyon: Olgu saporu

Dental florozis, diş gelişimi sırasında yüksek konsantrasyonlarda aşırı florüre maruz kalma sonucu diş dokusunda görülen gelişimsel bir bozukluktur. Estetik, fonksiyonel ve buna bağlı oluşan psikososyal problemler nedeniyle tedavi gerektiren dental florozisin oluşturduğu en büyük kaygı daimi dişlenmede görülen estetik deformasyonlardır. Amacımız florozis olgularını doğru analiz etmek ve florozisli hastalara uygun tedavi seçenekleriyle iyi bir fonksiyon ve estetik kazandırmaktır.

Laminate veneer restorasyonlar, konservatif tasarımı, dişlere zarar vermemesi ve anterior dişlerin estetik restorasyonları için mükemmel estetik seçenekleri sayesinde alternatif bir tedavi yöntemi olarak uygulanabilirler. Çalışmamızda florozis tanısı konulan ve üst anterior dişlerinin görünümünden rahatsız olan iki genç kız kardeşin dişlerine direkt ve indirekt teknik yöntemleri ile laminate veneerler yapılması planlandı. Laminate veneerler ile yapılan tedaviler, minimal invaziv yaklaşım sayesinde hastaların estetik beklentilerini memnuniyetle karşıladı.

ANAHTAR KELİMELER

Dental florozis, laminate veneerler

Dental fluorosis occurs as a result of excess fluoride ingestion during tooth formation. Enamel fluorosis and primary dentin fluorosis can only occur when teeth are forming, and therefore fluoride exposure (as it relates to dental fluorosis) occurs during childhood (DenBesten and Li 2011). The primary pathological finding of fluorosed enamel is a subsurface porosity, along with hyper and hypomineralized bands within the forming enamel (Fejerskov et al. 1974, 1975, 1977, 1979, 1991, Kidd et al. 1981, Kierdorf et al. 1993).

Fluoride can also result in mineralization-related effects on dentin formation. Severely fluorosed human dentin is characterized by a highly mineralized sclerotic background pattern, scattered with hypomineralized porous lesions primarily in the subsurface area. Scanning electron microscope images show dentin tubules with an irregular distribution and narrow and disrupted lumina, rather than the regular appearing lumina seen in normal dentin (Rojas-Sanchez et al. 2007). In its mild forms (which are its most common), fluorosis often appears as unnoticeable, tiny white streaks or specks in the enamel of the tooth. In its most severe form, tooth appearance is marred by discoloration or brown markings. The enamel may be pitted, rough and hard to clean (Alvarez et al. 2009).

The adequate diagnosis of fluorosis requires inspection of dry and clean dental surfaces, under a good light source. Upon eruption into the mouth, fluorosed enamel is not discolored, the stains develop over time due to the diffusion of exogenous ions (ex, iron and copper) into abnormally porous enamel. Nowadays, the differential diagnosis between fluorosis and non-fluoride-induced opacities needs to establish differences between symmetrical and asymmetrical and/or discrete patterns of opaque defects. These criteria imply that all symmetrically distributed and non-discrete opaque conditions of enamel are fluorosis (Clarkson et al. 1989).

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Restoration of these discolorations is important because of esthetics, functional concerns and a positive phsychological impact for the patient. Treatment options for fluorosis varies with severity. Depending upon severity, treatment option varies; Micro/Macro abrasion, bleaching, composite restorations, veneers and full crowns (Akapata 2001).

With the increasingly commercial emphasis on dental esthetics, patients have become more interested in improving the appearance of their smile. Laminate veneer restorations can be processed as an alternative treatment modality due to conservative design, harmless to teeth and excellent esthetic options for ethetic restorations of anterior teeth. Porcelain laminate veneers have high abrasion resistance and color stability, but they are expensive (Schmidseder 2000). Restoration with direct composites is quick and minimally invasive. This approach inexpensive, the resulting restoration is easy to repair and the esthetic results acceptable (Özcan 2009).

CASE REPORT

This 2-case-report presents the esthetic rehabilitation of 2 dental fluorosis patients using direct and indirect laminate veneer techniques.

Two young siblings aged 23 and 20, with a chief complaint of discolored upper front teeth reported to the Yüzüncüyıl University Faculty of Dentistry, Departments of Prosthethics. They gave a history of discoloration since their childhood. After a detailed interview it was learned that many people lived in their village had the same dental problems. Started seeing that after the change of the village water supply. It is thought to be an endemic fluorosis.

The case report presented here describes minimally invasive treatment of anterior teeth with porcelain laminate and composite laminate to restore esthetics. The patients were informed about the etiology of their complaint and treatment options were evaluated. Both of the patients preffered a minimally invasive and esthetic treatment modality.

CASE I

The girl aged 23 had mild grade of fluorosis in her upper teeth. Thin white lines and brown markings are seen across the central incisors surface (Figure 1). She preferred two porcelain laminate veneer restorations.

Figure 1.

Frontal view of the anterior teeth before treatment

In this case, an incisal overlap preparation was selected to give the dental technician maximum control over esthetics characteristics and translucency (Meijering et al. 1998). The facial, mesial, distal and incisal surfaces of the central incisors were reduced with a high-speed diamond rotary instrument (ISO 199/014 and 199/016,Shofu Inc.,Kyoto,Japan) under water coolant (Figure 2a, b and Figure 3a, b). The impression was taken with polyvinylsiloxane impression materials(addition silicone regular body normal settine, Zhermack, Badia Polesine, Italy). Using a shade guide(vitapan 3D-Master), shades 1M2,2M2 were selected for the patient. Porcelain laminate veneers were fabricated with IPS e.max Press system (Ivoclar-vivadent, Schaa, Liechtenstein). Then the veneers were checked on the master cast for esthetics and adaptation. instrument filled with fine diamond particles (CompoMaster, Shofu Inc.). The patient was satisfied with the esthetics and function of the restoration after treatment (Figure 4a, b).

After try-in of the restoration, the surface to be bonded was etched with 5% hydrfluoric acid(HF-Gel, GC Corp) for 20 seconds, washed under tap water, dried with an air syringe, and primed with a three-liquid ceramic bonding agent (Clearfil Porcelain Bond, Kuraray Medical Inc.). The reduced enamel surface was etched with 37% phosphoric acid (3M Scotchbond: 3M ESPE,St.Paul,Minn) for 30 seconds,washed dried with an air syringe,and primed with a two-liquid bonding agent(Clearfil New Bond, Kuraray Medical Inc.) The restorations was bonded with dual-cured resin cement (Clearfil SA Cement, Kuraray Medical Inc.). Light polymerization was performed with a hand-held unit (3M ESPE Elipar Freelight, Germany) 10 seconds, removal of

Figure 2 (a, b).

The central incisors preparations

Figure 3 (a,b).

The central incisors preparations

excess resin cement with probe. Photopolymerization from multiple directions (40 s each direction) was implement. The marginal areas of the enamel-resin-porcelain interface were ground with a diamond rotary instrument and polished with a rotary silicone instrument filled with fine diamond particles (CompoMaster, Shofu Inc.). The patient was satisfied with the esthetics and function of the restoration after treatment (Figure 4a, b).

Figure 4 (a,b).

Facial view of the final restoration

CASE II

The girl aged 20 years old, all the teeth surfaces affected, white spots, pitting and brown stains were observed on the enamel and had diestema between cenral incisors (Figure 5a, b). Six upper front teeth due to the case II because of expensive porcelain laminate chose to make composite veneers. In the case, treatment plan involved direct composite restorations from superior canine to canine and inferior canines and first premolars. Direct composite laminate veneer restoration preferred due to these are more chap than porcelain restorations.

Figure 5 (a,b).

Intraoral view of teeth before treatment

Figure 6 (a,b).

Finished and polished restorations

A small bevel was prepared with diamond bur to conceal the union line between the tooth structure and the composite resin. The rough surface was obtained for a better bonding. The buccal, mesial, distal, incisal and incisal third of the lingual surfaces of the teeth were conditioned with 37% phosphoric acid gel (3M Scotchbond: 3M ESPE, St.Paul, Minn) for 30 seconds. The teeth were rinsed with water spray for 30 seconds and the teeth were air dried. Teeth were conditioned and primed with a self-etching adhesive (Clearfil SE bond, primer; Kuraray Co. Ltd) and polymerized for 10 seconds with a polymerizing unit (3M ESPE Elipar Freelight2, Germany). Hybrid resin composite (Universal Restoratif 200, 3M ESPE, St.Paul, ABD) was placed and tried to close the diestema between central incisors and then light-polymerized for 40 seconds. The diestema did not close fully because of large distance between incisors. So the composite was piled from the rear forward. The restorations was contoured and polished with polishing discs (Sof-Lex; 3M ESPE). The patient was satisfied with treatment outcome (Figure 6a, b).

CONCLUSION

Diagnosis of dental fluorosis was made from their familial history and place of residence and type of drinking water used (Sherwood 2010). According to the girls in this report, their parents and older siblings do not have dental discolored. They gave history of discoloration since their childhood. The change in their drinking water in the region is seen in humans has emerged of dental discoloration.

One of the most important parts of diagnosis of dental fluorosis is differentiating this entity from amelogenesis imperfecta and molar-incisal hypo mineralization and most important data for differentiating dental fluorosis from other pathologies will be familial history, place of residence, chronology of discoloration appearance (Peter et al. 2007). In spite of all findings, dental fluorosis is difficult to distinguish clinically and histologically from other type of hypoplastic and hypomineralized enamel (Watts et al. 2001).

This case report has described the restoration of the anterior dentition with porcelain laminate and composite laminate venners. Advantage of direct composite veneer is that it is done with minimal chair time when compared to indirect ceramic veneers, disavantage being its long term wear resistance, color stabilty (Roberson et al. 2002). There was no significant difference in patients satisfaction with composite or ceramic lamina veneers immediately after placement. In Case I, an in-office bleaching approach was advocated but could not get a sucessful outcome. In the other case, the girl had diestema and there were defects on the teeth. Patients preffered a minimally invasive and esthetic treatment modality. The teeth with esthetically problem were restored with laminate veneers. The use of porcelain laminates and composite veneers could be a suitable alternative to conventional prosthetic approaches.

Diagnosis and esthetic functional rehabilitation of two patients with dental fluorosis: Case report

Dental fluorosis is a developmental disturbance of dental structure caused by excessive exposure to high concentrations of fluoride during tooth development. The greatest concern in dental fluorosis is esthetic deformations in the permanent dentition, requiring treatment due to esthetical, functional and related psychosocial problems. The aim was to properly diagnose the case and to provide good function and esthetics to the patients with provided treatment options.

Laminate veneer restorations can be processed as an alternative treatment modality due to conservative design, minimal damage to teeth and excellent esthetic options for esthetic restorations of anterior teeth. In this case fluorosis diagnosed in two young siblings who were uncomfortable about their upper anterior teeth, planned to restore with laminate veneers (direct and indirect techniques).

Treatment with laminate veneers satisfied the esthetic requirements with minimally invasive approach.

KEY WORDS
Dental fluorosis, laminate veneers

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