ACTA SCIENTIFIC DENTAL SCIENCES (ISSN: 2581-4893)

Volume 3 Issue 4 April 2019

Case Report

Dental Trauma, Aesthetic Management: A Case Report

Serrat Baron R*, De Ribot Porta J, Jané Noblom L and Ali Hussein A

Resident of MSc in Restorative and Aesthetic Dentistry, Spain

***Corresponding Author:** Serrat Baron R, Resident of MSc in Restorative and Aesthetic Dentistry, Spain.

Received: December 05, 2018; **Published:** March 06, 2019

Abstract

This case report describes the treatment of a twenty-nine years old woman, who came to the University Dental Clinic at the International University of Catalonia, referring to be accomplished for having a very dark tooth. She had an over fifteen years root canal treatment due to trauma in her upper right central incisor. It was presenting as well, high degree of discoloration, and an unaesthetic aged Class IV composite on both upper right incisors. After a complementary, radiographic and aesthetic study, was decided to perform a technique of internal and external tooth whitening using Carbamide Peroxide 16% for ambulatory use, aiming optimal substrate. Subsequently, the composite restorations were replaced for better aesthetic and functional integration.

The results show the combination of internal and external tooth whitening help us to achieve, in most cases, a favorable aesthetic appearance. The use of direct composites can be a tool to achieve the expectations of our patients following the principles of minimally invasive treatments. A correct diagnosis and treatment plan makes possible the obtention of a predictable, optimum and satisfactory results returning the confidence to our patients.

Keywords: Trauma; Aesthetic; Tooth

Introduction

Most cases of dento-alveolar trauma occur in the maxillary incisor area [1] affecting the aesthetics and confidence of our patients. Their high expectations and demands make the dental fracture a big challenge to face frequently in our day-to-day work. It is presented in this case, a clinical approach following the principles of minimally invasive dentistry, for correct planning and treatment in the anterior area.

Case Report

A twenty-nine years old caucasian woman came to the University Dental Clinic at the International University of Catalonia, referring: "I hate my black tooth and I do not like my smile". The patient referred a trauma against a wood chair fifteen years ago treated at that time with an root canal treatment and several composite fillings.

Examination

Following the University protocol based on the Fradeani's esthetic analysis [2], all the necessary facial and intra oral photos were taken. For the extra oral analysis a front photo was used to study the third proportions and a lateral view was done to evaluate the nasolabial angle and the convex profile. Three closer photos registered the rest position, social smile and forced smile, classifying the patient as a high smile due to her full tooth exposition plus two-three millimeters of gum (Figure 1). No other relevant information was taken from the intraoral analysis in statics and dynamic photos.

Figure 1: Full Smile analysis.

A closed up photo was taken to focus in the chief complain of the patient. All hard and soft tissues where analyzed. It is at this view when we can really appreciate an unaesthetic aged Class IV composite on both upper right incisors. All zenith and teeth axes were correct and even the old fillings presented in upper right central and lateral incisors had the correct shape, there was an evident high degree of discoloration and disharmony (Figure 2).

Figure 2: Intra oral analysis.

An OPG and cast models were taken non adding relevant information for the case. Having a brief idea of patient's demand and possible treatment plan, we helped ourselves with other specific analysis for the case. The transillumination photo helped us to study the possible dentine anatomy to mimic, a black and withe photo (provided us the tooth value) (Figure 3) and a spectrophotometer study (known as the only instrument to have an objective color measurement) (Figure 4) [3].

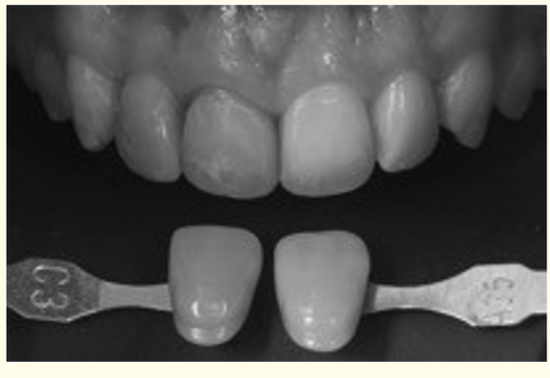

Figure 3: Black and white photo.

At this point, all the examination was finished but there were three points that needed to be deeply studied to guarantee the specific and appropriate treatment plan for this patient. This aspects were:

Figure 4: Spectrophotometer analysis.

- A root canal treatment in 1.1 done fifteen years ago
- Which technique could be the best to achieve a good substrate shade in 1.1 discoloration.
- Control the high aesthetic demands from the patient.

For the complete valuation in 1.1, patient was referred to the endodontic department. There was no signs of vitality and no tenderness to percussion. The tooth was asymptomatic for the last fifteen years. The literature describe that the CBCT showed statistically larger number of PA radiolucencies than did PA radiographs [4,5]. For this reason, to guarantee the abscense or presence of periapical lesion, a CBCT scan was taken.. No image compatible with a possible affectation was seen, but the appearance of the old root canal treatment was not the correct one.

It is described in the literature the internal and external whitening as a non invasive technique to change the substrate shade for achieving a favorable aesthetic appearance. Three materials were discussed and searched in the literature. A first option was the sodium perborate, that was declined because has been banned in cosmetic products by EU legislation after been classified as carcinogenic, mutagenic, or toxic for reproduction (CMR) in December 2010. As a second option we considered the use of Hydrogen Peroxide 30%. The literature refers recession of the intertubular dentine surface and significantly decreased the hardness and Young's modulus of intertubular dentine [6]. For this reason, to prevent the possible cervical resorption, hydrogen peroxide was rejected. The material chosen was carbamide peroxide 10-16% due to its lower concentration and risk.

The sequence of the final treatment plan decided was:

1. Palatal preparation for the acces of the internal bleaching material.
2. Internal and external whitening process.
3. Control.
4. Direct composite filling on 1.2 and 1.1.

The palatal cavity was prepared under absolute isolation based on the literature. The root filling was reduced 1-2 mm below the enamel cementum junction [7,8], the adhesion protocol was followed and the floor was sealed with flowable composite (Figure 5-7). It is important at the end guarantee the no presence of adhesive on the walls to let the whitening material work. For this reason, an endo Z carbure bur was used to clean the walls and a last application of ortophosphoric acid was made to remove the smear layer.

Figure 5: Etching the cavity.

Figure 6: Flow application.

Figure 7: Etching the cavity.

Treatment planning

Having all the exploration and complementary tests evaluated, we were able to offer the patient an accurate treatment plan based on the literature and following the minimal invasive principle. Different restorative options were given as indirect porcelain veneer, indirect composite veneer or direct composite for 1.2 and 1.1. Advantages and disadvantages were exposed for each option and the patient decide for the direct composite option due to its reparability, and the possibility to conserve more dental structure in compare with indirect restoration.

The use of carbamide peroxide 16% was chosen as a walking home dual (internal and external) whitening technique. The patient was instructed to apply the material in the palatal cavity every 3 hours for 5 days. That material was hold in there with a whitening vacuum that was used at the same time during the night for the external bleaching process. This technique offers several advantages (faster, conservative, less risk of reposition) in compare with classic techniques and materials, and the only disadvantage is the importance of the patient's collaboration.

Three weeks after the result was evaluated and compared with the initial situation through spectrophotometer study to elaborate a table with the initial and final results based on the Color Guide VITA classical A1-D4® (Figure 8) and photography (Figure 9).

Figure 8: Table comparing spectrophotometer results.

Direct composite restoration

After 2 weeks to leave the achieved color settle, the composite restorations were replaced. All the old composite was removed with an endo Z bur and polishing discs to do not affect the remaining tooth structure. During the process was decided to safe the palatal wall, considered excellent in shape and integration (Figure 10).

A light-curing, highly esthetic nano- hybrid composite filling material was used (IPS Empress Direct® by Ivoclar Vivadent) due to its excellent polishing properties and mimics of natural teeth appearance. A color map was made in the adjacent tooth to choose the most appropriate dentine and enamel shade (Figure 11).

Figure 9: Initial situation compared after internal and external whitening treatment.

Figure 10: Palatal wall preserved.

Figure 11: Color map and shade decision.

With an absolute isolation from 1.3 to 2.3 both restorations were made after following the adhesion protocol. Owing to the presence of composite was necessary a sandblasting with 30 microns aluminum oxide (Figure 12). The palatal wall was completely reshaped with a silicon guide elaborated in the laboratory from her cast model (Figure 13). After, two different layers of dentin were placed, conforming the dentine mamelons studied in the examination phase (Figure 14). An opaquer resin was placed to cover up the fracture line and the substrate's darkness. The opalescent resin was used in the incisal edge area to mimic the halo effect present in the contralateral tooth (Figure 15).

Figure 12: Sandblasting.

Figure 13: Reshape palatal wall.

The last layer of enamel was applied in 1.1. It is important to be with a maximum thickness of 0,5mm to do not obtain a grey aspect of the restoration. We repeat the same procedure in 1.2 taking in to account as an important aspect the contact point between upper right central and lateral incisors (Figure 16).

Figure 14: Dentin first layer.

Figure 15: Opalescent application.

Figure 16: Lateral contact point.

The final aspect was analyzed with and without isolation, and the patient is advised to return a week after for final polishing (Figure 17,18). It is well known the necessity of time for the rehydration of the dental structure and how this effect can make us be wrong in the shade and light reflect evaluation.

A week after the patient came for the polish appointment. The first step was mark with a pen the transitional lines and elaborate a polishment to mimic the contralateral (Figure 19). Following Ivoclar Vivadent® recommendation, Astropol® three- step polishing system was used to reshape angles and retouch length and volume (Figure 20).

Figure 17: Final isolated aspect.

Figure 18: Final aspect before polishing.

Figure 19: Transitional lines aspect.

Figure 20: Astropol polish system.

For a correct finishing and polishing, the system manufactured by Micerium diamond paste shiny A and B and aluminum oxide paste shiny C were used (Figure 21). Finally a wear down endo Z bur was used to reproduce the micro texture and micro anatomy present in the buccal face of the incisors providing an optimal final result and a total restoration integration (Figure 22,23).

Figure 21: Shiny B polishing paste.

Figure 22: Micro texture.

Figure 23: Initial status compared with final result.

Conclusion

A correct examination and planification make possible the obtention of a predictable, optimum and satisfactory result returning the confidence to our patients. The use of Carbamide Peroxide 16% as a simultaneous external and internal whitening helps us to achieve, in most cases, a favorable aesthetic appearance. The use of direct composites can be a tool to achieve high esthetic demands from our patients following the principles of minimally invasive treatments.

Bibliography

1. Andreasen JO and Ravn J. "Epidemiology of traumatic dental injuries to primary and permanent teeth in a Danish population sample". *International Journal of Oral Surgery* 1.5 (1972): 235-239.

2. Fradeani M. "Análisis Estético: Un acercamiento sistemático al tratamiento protésico". *Quintessence* 1 (2006).

3. Bentolila O and Roig M. "Selección de color dental con la utilización del SpectroShade™ "Micro" Dental". *Revista Odontológica de Especialidades* (2009): 4.

4. Abella F., *et al*. "An evaluation of the periapical status of teeth with necrotic pulps using periapical radiography and cone-beam computed tomography". *International Endodontic Journal* 2014, 47(4): 387-396.

5. Estrela C., *et al*. "Accuracy of Cone Beam Computed Tomography and Panoramic and Periapical Radiography for Detection of Apical Periodontitis". *Journal of Endodontics* 34.3 (2008): 273-279.

6. Chng H., *et al*. "Effect of hydrogen peroxide on intratubular dentine". *Journal of Dentistry* 33 (2005): 363-369.

7. Plotino G., *et al*. "Nonvital Tooth Bleaching: A Review of the Literature and Clinical Procedures". *Journal of Endodontics* 34.4 (2008): 394-407.

8. Attin T., *et al*. "Review of the current status of tooth whitening with the walking bleach technique". *International Endodontic Journal* 36.5 (2003): 313.

Volume 3 Issue 4 April 2019