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CASE REPORT

Aesthetic smile makeover with direct resin composite veneers: a case report

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Direct Composite veneers allow clinicians to deliver a beautiful result with the possibility of being minimally invasive. The ability to be as conservative as possible is important for longevity of existing tooth structure and reduces the risk of failure of teeth in future and need for more invasive treatments. The successful completion of a smile designing case with direct composite veneers is extremely rewarding and humbling for the clinician while it provides the patient with outstanding results.

Keywords: direct composite veneer, smile design, smile designing principles, internal bleaching, aesthetic dentistry, minimally invasive approach, responsible aesthetics

Introduction

A smile design case involves far more aspects than just placement of restorative material which will replicate tooth. Many patients come to us with different pathologies affecting dentition while seeking a more attractive smile. It is essential to diagnose and treat the underlying causative factors. It is beneficial to prioritize and stage the sequence of treatment steps based on the severity of infection and the final outcome visualized. This patient had multiple issues which had to be addressed individually. In the end all the treatment modalities came together symbiotically to deliver the exceptional result.

The chief complaint of the patient was dental caries in multiple teeth, unattractive appearance of teeth with different shades; affecting her confidence levels and making her reluctant to smile.

Case presentation

Chief Complaint- A 43-year-old female patient presented with a chief complaint of multiple decay sites and dark front tooth. She was looking for a more attractive smile. She described her teeth as asymmetric, uneven, worn. She was unhappy with the color of her teeth and the lack of uniformity in shade. She wanted a lighter shade for her teeth (**Figures 1** and **2**).

She had two of her teeth extracted in the past as they were fractured; number 16 and 36 few years ago. She also gave a history of fall/trauma long time ago resulting in discoloration of tooth number 22.

The patient has no significant medical history.

Clinical examination revealed the patient had multiple caries in majority of her front teeth. Tooth number 22 was non vital concluded after negative response to thermal test. Gingival health needed improvement. There was horizontal tension/lack of parallelism between her smile line and horizontal facial plane/inter pupillary line.

TM Joint seemed healthy.

Diagnosis

The patient presented with following challenges

1. Multiple caries sites
2. Tooth and gingival asymmetry
3. High lip line causing excessive gingival display
4. Facial asymmetry
5. Non vital 22

6. Compromised oral hygiene

The patient was photographed for the required American Academy of Cosmetic Dentistry (AACD) views (1).

A diagnostic impression was made of both the upper and lower dentition.

Routine scaling was done and patient was taught home care regimen and discharged after this initial appointment.

Treatment plan

1. Create a Diagnostic wax up on the model for reference. Plan the required treatment modalities on the cast itself like crown lengthening procedure (CLP), direct composite veneers with 15, 14, 13, 12, 11, 21, 22, 23, 24, 25.
2. Endodontic treatment and internal bleaching for tooth number 22 in 3–4 visits.
3. CLP with tooth number 11, 21, 22, 23, 24, 25 for better gingival symmetry by following principles of smile designing.
4. Dental caries management 11, 21, 21, 22.

The diagnostic wax up highlighted to the patient the proposed changes. The new anatomic form provided more length, improved facial and gingival symmetry, better axial inclinations, and fuller buccal corridors. The patient approved of the proposed treatment and was keen to start.

Discussion/treatment details

Endodontic therapy with internal bleaching

The patient was administered with Local Anesthetic Lignospan special - Lidocaine Hydrochloride 2% with Adrenaline 1:80000 USP, 1.8 ml cartridge Septodont Company.

Endodontic treatment was performed on tooth number 22 in two sittings. First sitting was utilized for thorough bio mechanical preparation (BMP) along with ample irrigation with diluted 5% sodium hypochlorite. Dentsply Protaper gold system was used in the recommended sequence after initial preparation with hand files.

At the 2^{nd} sitting after meticulous BMP and irrigation; an endoactivator (Dentsply) was used for 30 seconds followed by drying of access cavity and canals with 6% paper points. The sealant used was Sealapex – Kerr with Guttacore obturation system – Thermaprep oven of Dentsply. The canal was filled and sealed thoroughly. A layer of restorative glass ionomer cement (GIC) was placed at the cervical third of canal to seal it from the effects of bleaching agent.

Internal bleaching was performed with Opalescence Endo Kit, Non-Vital Endo Bleaching System- ultradent in three sessions with an interval of few days between each session. After final bleaching session the access cavity was restored temporarily with GIC for 3 weeks. After 3 weeks the access cavity was reopened, thoroughly irrigated with normal saline. Excellent shade elevation was achieved after internal bleaching sessions.

The access cavity was etched for 30 seconds with 37% phosphoric acid, washed and air dried for 20 seconds. Bond application Vivapen – Ivoclar Vivadent air dried and cured. Renamel Microfill B0 shade was used to restore the access cavity along with white opaquer from Cosmedent after total etching and bonding.

Gingivectomy

Gingival zeniths for each tooth as per smile designing principles were created to reduce the excessive gum display. The horizontal interpupillary line was used as a reference.

After anesthesia bone sounding was performed and the results verified that adequate space for gingivectomy/CLP was present without violating the biologic width.

CLP was performed by cautery (Coltene Whaldent Perfect). The gingival heights of various teeth were adjusted parallel to lower eyelid line and lip line as the patient has asymmetric eye levels. Sufficient time was given for gingival healing. Patient was given gum paint, Vit C and Vit B12 tablets, mouthwash with chlorhexidine to assist with healing process.

Roughly a period of 1 month was given for gingival healing and endodontic treatment with bleaching. After positive response from patients' tissue, the direct veneer process was undertaken.

Direct veneer process

Preparation

All areas of decay, stain, damaged or poorly supported enamel were excavated using an electronic handpiece with adequate water irrigation. Each tooth was worked with separately and individually. Isolation was maintained throughout the procedure with a lip & cheek retractor – OptraGate Ivoclar Vivadent.

The steps for each tooth are as follows:

Etching and bonding

1. Total etch the tooth for 20 seconds. Rinse & Dry.
2. Adjacent teeth are covered with Teflon tape
3. Bonding agent – Vivapen is applied and cured as per manufacturer's instructions.

Layering

Macroesthetics like labial surface plane development, line angles, midline, central dominance, buccal corridor development, axial inclinations, proper teeth position, following smile line were created at this stage (2–4) (**Figures 1** and **2**).

Composite instrument primarily used was Ivoclar Vivadent Optrasculpt, spear shaped flat ended composite instrument, brushes no. 0 and 1

1. Palatal silicone key made from the wax up is used to build palatal shelf, proximal surface and increase the incisal length. The base shade chosen here is Renamel Microfill A1. It was used along with Renamel Microfill Flowable B1 shade. The composite is loaded onto the silicone key, placed in mouth, and adapted to tooth. Cured for 10 seconds from labial side. Excess is removed before curing from palatal side with # 12 blade. Dental Floss is used to ensure separation (5).
2. Transparent Mylar strip is placed around the tooth from labial side along the gingival zenith. It is snugly fitted but without any pressure. The labial surface is created using Renamel Microfill A1 shade + Flowable shade A2 and B1. After ensuring proper packing with gentle condensation and no air bubbles, it is cured for 20 seconds (5).
3. The labial surface is shaped and refined as per requirement with tapered fissure bur and red ring TC11 bur. The basic framework of every tooth is created for macro aesthetics (2, 5) (considering line angles, cervical and incisal embrasure, labial contour and incisal edge, emergence profile, axial inclination).
4. These steps were followed for all concerned teeth. Further refining of these teeth was done as per requirement following principles of smile designing (2, 6). Finishing with Cosmedent coarse and fine disc, Diatech polishing wheel was done.

The patient was discharged after this long appointment and recalled after 2 days. She was able to asses her new smile and bite for aesthetics and function.

Imparting chroma/creating natural effects

The microesthetics were taken into consideration – refining line angles, developing cervical and incisal embrasures, keeping proper interproximal contact lengths while tapering it from centrals to laterals to canines, development of labial anatomy i.e. lobes on all incisors, creating texture (2, 5–8) (**Figures 3** and **4**).

1. In the incisal third cut back of 0.5–1 mm was done creating a trough. Mild cut back was done on the

FIGURE 1 | Preoperative retracted.

FIGURE 2 | Postoperative retracted.

FIGURE 3 | Preoperative 1:1.

FIGURE 4 | Postoperative 1:1.

incisal and middle third labial surface between line angles to create space for layering (5).

2. Tints used in the incisal area are grey, blue, light brown, pink opaquer, white opaquer all from Cosmedent company as per the above-mentioned sequence using a no. 8 endodontic file and a sharp probe, zero number brush. Considering the age of the patient creation of significant incisal translucency and halo effect was avoided. A light brown tint was applied very lightly in the gingival third to create more chromatic effect replicating natural teeth (5, 9–12)
3. Flowable A2 shade and a layer of Renamel Nanoplus A2 shade was used in the incisal third just short of the trough margin created (5).
4. Ivoclar Vivadent IPS Empress Direct Trans 30 shade was used to cover the incisal, middle and gingival half of tooth surface (5).
5. Reshaping and finishing were done with coarse, fine discs from Cosmedent. Red ring fine bur TC 11 was used to create primary & secondary anatomy. Yellow carbide burs were used for finer finish (6, 7).
6. Fine and super fine discs from Shofu, wheels from Diatech were used for polishing. For final glaze buffing disc - Flexibuff was used with polishing paste Enamelize Cosmedent (6, 8).
7. Bite was adjusted with mild enameloplasty on lower anteriors by following Dawsons principles using 200 microns horse shoe shaped articulating paper from Bausch.

Outcome and result

After every appointment the full series of required photographs were taken. Using this information a thorough evaluation of progress and mistakes was made. Modifications were made as per these evaluations. A continuous critical self-assessment and training one's eye for finer details helped in reaching the desired final outcome.

The final restorations exceeded patient's expectations. She participated with complete enthusiasm as she could see every appointment bringing her closer to her dream smile (**Figures 5** and **6**).

The home care regime included proper brushing technique, use of water flosser every day and regular follow up appointments. Patient was advised to refrain from diet heavy in sugar content and food excessively hard to bite into like candies, caramelized chocolates etc.

The patient returned after 2 weeks, 1 month, 3 months, 6 months and 1 year for her follow up appointments. The new restorations and tissues exhibited excellent health and stability over last 1 year (**Figures 3** and **4**).

FIGURE 5 | Preoperative smile.

FIGURE 6 | Postoperative smile.

Summary

The impact of smile transformation is life changing. A smile can provide a glimpse into a patient's emotions, health, and age. There is a great desire to portray best of these attributes even as patients prefer minimally invasive treatment options. It is crucial to listen to the patient's expectations and educate them through detailed discussions and literature ultimately providing them with excellent care.

Direct composite veneers is an excellent treatment option that is not explored by majority of clinicians because of its technique sensitivity and time constraints. There is also a fear of staining of composites and breakage in due course of time. It is an intensive exercise in planning and execution by the dentist requiring him to wear many hats. However, with sufficient training and preparation this treatment can be provided in a systematic and predictable way resulting in a very rewarding outcome. It can be concluded that this treatment modality is an epitome of LESS IS MORE.

Disclaimer

Patient's identity has been anonymized in accordance with ethical guidelines for publication. Consent for publication of images has been obtained.

All the intra oral images are RAW and have not been modified in any way whatsoever.

AI has not been used in the article writing except for minimal use like spelling and grammar check.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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