

FULL MOUTH REHABILITATION OF A SEVERELY WORN DENTITION

SMITA KOLE

Dentin hypersensitivity is exactly what it sounds like: pain or discomfort in the teeth as a response to certain stimuli, such as hot or cold temperatures.

A patient of 72 years, who had visited a dentist a few years back for getting a crown done over the maxillary right second molar and an endodontic treatment on mandibular left first molar, visited our dental operatory complaining of full mouth dental sensitivity, inability to chew and a fear that he may need endodontic treatment for all his teeth.

Intraoral and photographic examination revealed that the patient needed FMR with increased VOD. Leaf guage testing, phonetics and speech testing was done to evaluate different parameters of occlusion. Face bow was recorded as shown in **Figure 1** and **Figure 2**.

Dental history form was filled to assess other parameters so that patient also understood his problem and need for the dental treatment. (**Figure 3**)

The maxillary and mandibular arch impressions were made.

INTRA ORAL EXAMINATION

- Anterior deep bite and decreased overjet leading to pain in right TMJ.
- Low incisor visibility.
- All the posteriors showed significant amount of enamel loss leading to exposure of dentin at several places causing sensitivity and inability to chew.
- Sharp incisal edges with minor enamel chipping.
- Class V cavities were observed with 14,15,16,26,27,34,35,36,46 and 47
- Recently patient observed pain in right TMJ while chewing, clinical examination showed Rocabado pain 1, 2 and 3 positive on right side TMJ.

PLANNED TREATMENT

- Scaling and polishing.
- Sending casts to laboratory for complete wax up at increased VOD
- The wax-up transfer using putty index, for 4 to 6 weeks.
- Emax veneers or table tops for all teeth as required.

IMPLEMENTATION

- Routine dental prophylaxis was done.
- Wax-up models and a new construction of bite was explained to the patient and same was transferred into mouth using putty index as shown in **Figure 4**.
- The putty index was prepared using addition silicon rubber impression material. (**Figure 5**)
- The bite was reconstructed using temporary BIS-acrylate, as shown in **Figures 6, 7** and **8**.
- The follow-up visit was kept after one week to observe for any interference and correction of the problem. During this follow-up visit patient revealed significant reduction in TMJ pain and sensitivity reduced to zero.
- Second follow-up was kept after 6 weeks, patient was comfortable and now planning was done for final occlusal reconstruction with Lithium Disilicate material.
- Treatment was planned, mandibular teeth preparation followed by maxillary arch with the gap of 3 to 4 days.



FIG 1: Showing the front, right and left lateral views of dentition. And a facebow record which is used to transfer the same on casts

MANDIBULAR ARCH

- All premolars and molars were prepared for Lithium Disilicate veneers and crownlays as per the need and available tooth material and the defects present. (**Figure 9**)
- Impressions were made in polyether impression material and sent to laboratory for reconstruction of Lithium Disilicate prosthesis. (**Laboratory work - Figures 10-22**)
- After a week prosthesis was received from the laboratory and clinical trials were done on teeth for fit and made ready for bonding. (**Figures 23, 24**)
- Now veneers are ready for bonding.
- Teeth are isolated for bonding using rubber dam as shown in **Fig 9** and teeth were etched with 37% phosphoric acid. **Figure 25**.
- Teeth were air dried and notice the frosty white appearance of enamel which indicates the amount of enamel present for bonding as enamel is the best substrate for bonding Lithium Disilicate prosthesis. (**Figure 26**.)
- The dual cure bonding agent is applied on teeth and these veneers were bonded using dual cure adhesive resin cement. (**Figures 27, 28**.)
- Here the bonding of veneers in mandibular arch is completed. (**Figure 29**.)



FIG 2: The occlusal views of maxillary and mandibular arch showing significant attrition in all posteriors and stains and calculus in mandibular anterior region.



FIG 4: Wax-up models showing the reconstruction of bite with increased VOD.

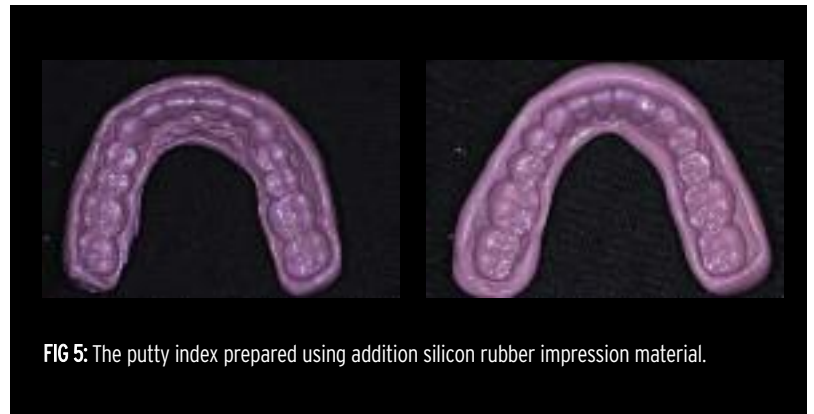


FIG 5: The putty index prepared using addition silicon rubber impression material.

PERSONAL HISTORY

1. Are you fearful of dental treatment? How fearful, on a scale of 1 (least) to 10 (most)?
2. Have you had an unfavorable dental experience?
3. Have you ever had complications from past dental treatment?
4. Have you ever had trouble getting numb or had any reactions to local anesthetic?
5. Did you ever have braces, orthodontic treatment or had your bite adjusted, and at what age?
6. Have you had any teeth removed, missing teeth that never developed or lost teeth due to injury or facial trauma?

GUM AND BONE

7. Do your gums bleed or are they painful when brushing or flossing?
8. Have you ever been treated for gum disease or been told you have lost bone around your teeth?
9. Have you ever noticed an unpleasant taste or odor in your mouth?
10. Is there anyone with a history of periodontal disease in your family?
11. Have you ever experienced gum recession?
12. Have you ever had any teeth become loose or fall out (without an injury), or do you have difficulty eating an apple?
13. Have you experienced a burning or painful sensation in your mouth not related to your teeth?

TOOTH STRUCTURE

14. Have you had any cavities within the past 3 years?
15. Does the amount of saliva in your mouth seem too little or do you have difficulty swallowing any food?
16. Do you feel or notice any holes (as biting, cracks) on the biting surface of your teeth?
17. Are any teeth sensitive to hot, cold, biting, sweets, or do you avoid brushing any part of your mouth?
18. Do you have grooves or ridges in your teeth near the gum line?
19. Have you ever broken teeth, chipped teeth, or had a toothache or cracked filling?
20. Do you frequently get food caught between any teeth?

BITE AND JAW JOINT

21. Do you have problems with your jaw joint? (pain, sounds, limited opening, locking, popping)
22. Do you feel the your lower jaw is being pushed back when you try to bite your back teeth together?
23. Do you avoid or have difficulty chewing gum, carrots, nuts, bagels, legumes, protein bars, or other hard, dry foods?
24. In the past 5 years, have your teeth changed (become shorter, thinner, or worn) or has your bite changed?
25. Are your teeth becoming more crooked, crowded, or overlapped?
26. Are your teeth developing spaces or becoming more loose?
27. Do you have trouble finding your bite, or muscles squawk, tap your teeth together, or shift your jaw to make your teeth fit together?
28. Do you place your tongue between your teeth or does your teeth against your tongue?
29. Do you chew ice, bite your nails, use your teeth to hold objects, or have any other odd habits?
30. Do you clench or grind your teeth together in the daytime or make them sore?
31. Do you have any problems with sleep (i.e. nightmares or teeth grinding), wake up with a headache or an awareness of your teeth?
32. Do you wear or have you ever worn a bite appliance?

SMILE CHARACTERISTICS

33. Is there anything about the appearance of your teeth that you would like to change (shape, color, size)?
34. Have you ever whitened (bleached) your teeth?
35. Have you felt uncomfortable or self-conscious about the appearance of your teeth?
36. Have you been disappointed with the appearance of previous dental work?

FIG 3: Kois dental history form.



FIG 6: The bite reconstructed in both the arches using BIS-acrylate.



FIG 7: Bite reconstruction of maxillary arch using temporary BIS-acrylate material.



FIG 8: Mandibular arch bite reconstruction using temporary BIS-acrylate material.

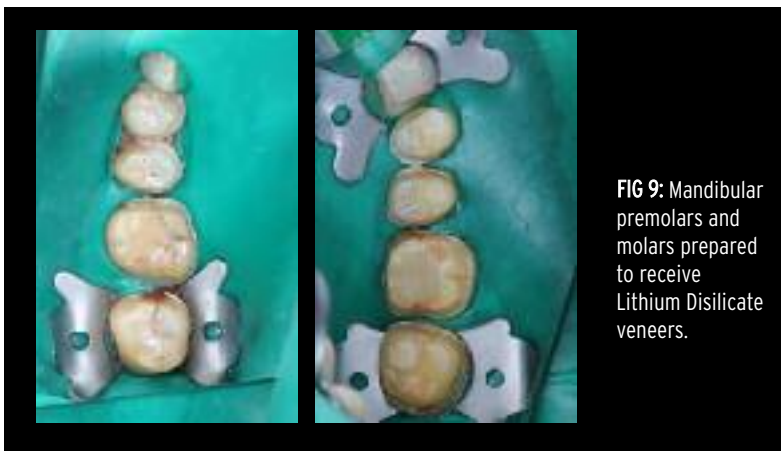


FIG 9: Mandibular premolars and molars prepared to receive Lithium Disilicate veneers.

- After a week the procedure was planned for maxillary arch
- Patient's comfort and all centric contacts and excursive movements were checked for any occlusal interferences.
- Maxillary teeth were prepared as shown in **Figure 30**.
- The polyether impressions were made and sent to laboratory to fabricate appropriate Lithium Disilicate prosthesis.
- After the prosthesis is retrieved from the laboratory, it was checked for trial on teeth and made ready for bonding as shown in **Figures 31**.
- At the same time all these maxillary posteriors were isolated with rubber dam and prepared for further bonding, as shown in **Figure 32**
- Acid etching was done with 37% phosphoric acid for 15 seconds. **Figures 33**

- Veneers are bonded using dual cure bonding agent and dual cure adhesive resin cement. (**Figures 34, 35**)
- As the bonding of all maxillary and mandibular posteriors was completed, further treatment was planned for anterior bonding in consequent visits which was planned after 5 days.
- The maxillary and mandibular anteriors were planned for single visit direct composite restoration as time availability was a concern for the patient.
- A quick clear silicon index was prepared for maxillary and mandibular anteriors using clear poly vinyl siloxane material and an addition silicon putty material and the same was tried intra orally for fit. (**Figures 36, 37**)
- The teeth are isolated with rubber dam and made ready for direct bonding composite restoration.
- Teeth are etched with 37% phosphoric acid and drying was carried out, after application of light cure bonding agent teeth were restored with flowable composite resin.
- The step by step process for all maxillary and mandibular anteriors is shown in **Figures 38-43** for maxillary teeth and **Figures 44-48** for mandibular anterior teeth.
- After the rubber dam was removed these direct composite restorations were polished with composite finishing and polishing kit. (**Figures 49-51**)
- Occlusal profile of completed anterior as well as posterior restorations. (**Figure 52**)
- 12 o'clock views compared before and after restoration. Observe the surface texture detailing on maxillary anteriors. (**Figures 53, 54, 55**)
- The occlusion was checked for all excursive movements, phonetics and occlusal interferences.

THE NEWER COMPOSITES

These newer composites are too strong with compressive strength of 250-350 Mpa which is very close to that of enamel and dentin due to the addition of zirconia and silica particles.

Nowadays these composites have become a material of choice in every field of dentistry because of its required physical properties. As advised by Dr. Pascal Magne the first material of choice is composite in such areas though the tensile strength which is around 50-90 Mpa is lower than the enamel and dentin. Also, the staining property of composite is much lower due to increased polishability of the material and the use of different composite finishing and polishing kits available in the market.

CONCLUSION

In many cases, clinicians can plan this simple procedure of direct composite restoration using a clear silicon index as a guide for accurate dimensional application in all possible treatment options as it needs minimal preparation of the tooth structure. This procedure replicates the morphology to its required finish level and also requires less chairside time for polishing composites. This clear silicon index allows almost complete polymerization of composite and resolves the problem of oxygen inhibition layer. This is also one of the safe and easy methods of restoring the tooth directly in single visit in these Covid-19 days. (**Figure 56**)

LABORATORY WORK

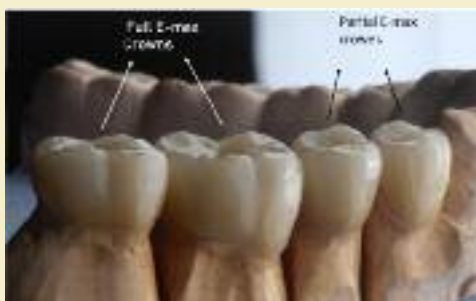


FIG 10: Class V cavities in 44,45,46,47 included in preparation and planned with LI-DI-DI prosthesis. The partial ceramic crowns of E-max were prepared with 44,45 while 46, 47 was planned for ceramic full crowns of E-max.



FIG 11: Class V cavities in 34,35 included in preparation and planned with LI-DI-DI prosthesis. The partial ceramic crowns of E-max were prepared with 34,35,36 and 37 was planned for ceramic full crown of E-max.



FIG 12: Class V cavities in 14,15,16,17 was included in preparation with LI-DI-DI prosthesis, and were planned for ceramic full crowns of E-max.



FIG 13: Class V cavities in 24,25 were included in preparation and planned with LI-DI-DI prosthesis. The partial ceramic crowns of E-max were prepared with 24,25 and 26 and 27 was planned for ceramic full crown of E-max.



FIG 14: Partial and full crowns following the chamfer margins as depicted on the working model



FIG 15: Fine contouring and detailing on occlusal surfaces of the crowns



FIG 16: Detailing of E-max crown.



FIG 17: Fineness of E-max crowns



FIG 18: Optical appearance of the crowns.



FIG 19: Fine detailing of the grooves and fissures with translucent enamel layering and proper contouring of all the surfaces.



FIG 20: Prosthesis cast fit



FIG 21: The dental ceramic art work with the natural characterization following the exact tooth morphology.



FIG 22: The prosthesis retrieved from laboratory.



FIG 23: Shows the fit of prosthesis on cast made ready for bonding. Etching of intaglio surface was done with 5% Hydrofluoric acid for 20 secs followed by drying, notice the frosty white appearance of these surfaces, a layer of silane coupling agent was applied and prosthesis was made ready for bonding.



FIG 24

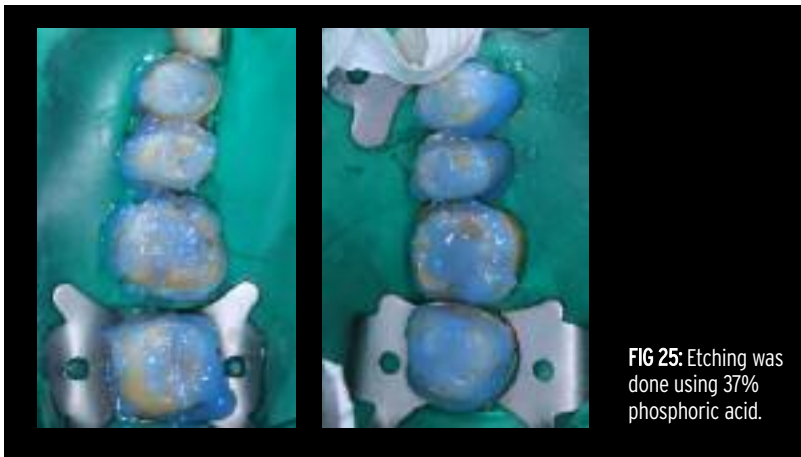


FIG 25: Etching was done using 37% phosphoric acid.

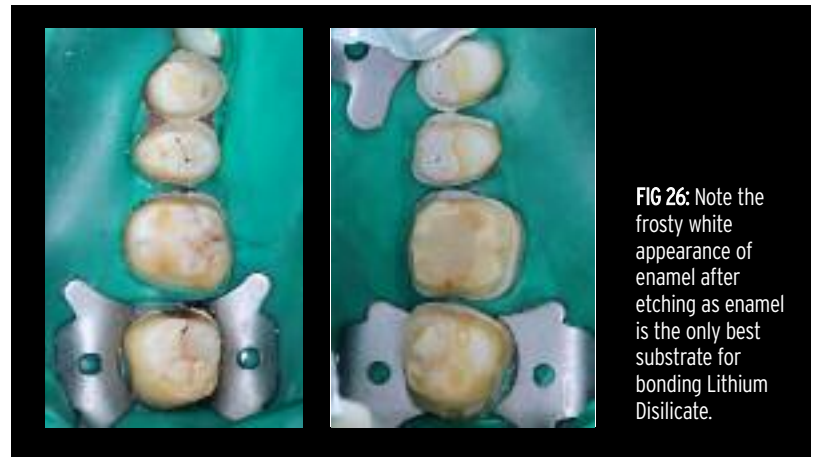


FIG 26: Note the frosty white appearance of enamel after etching as enamel is the only best substrate for bonding Lithium Disilicate.



FIG 27: Lithium Disilicate veneers were bonded with dual cure adhesive cement.



FIG 28: Lithium Disilicate veneers were bonded with dual cure adhesive cement.



FIG 29: Completed mandibular posterior bonding of veneers.



FIG 30: Maxillary posteriors prepared to receive Lithium Disilicate prosthesis.



FIG 31: Veneers are placed in a putty index frame, etching of intaglio surface was done with 5% Hydrofluoric acid for 20 secs followed by drying, notice the frosty white appearance of these surfaces, a layer of silane coupling agent was applied and prosthesis was made ready for bonding.



FIG 32: The split dam isolation of teeth.

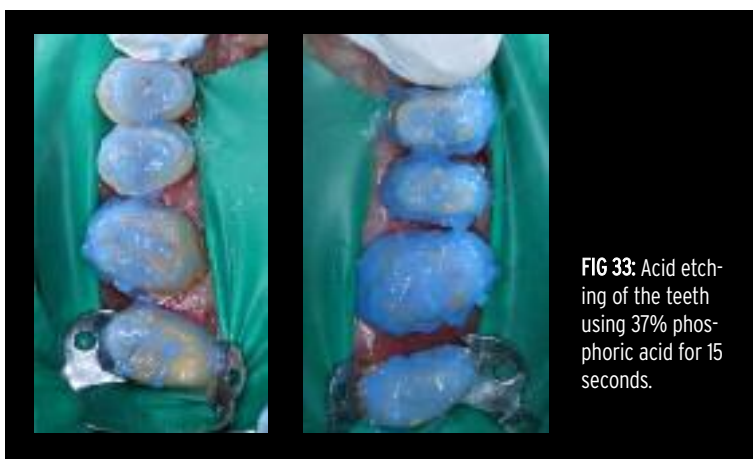


FIG 33: Acid etching of the teeth using 37% phosphoric acid for 15 seconds.



FIG 34: Shows bonded veneers using dual cure bonding agent and adhesive resin cement.



FIG 35: Immediate post op of bonded veneers after removal of rubber dam.



FIG 36: Shows a clear silicon putty index for maxillary anteriors prepared from the wax up.



FIG 37: Shows a clear silicon putty index for mandibular anteriors prepared from the wax up.



FIG 38: Shows pre-op view of maxillary and mandibular anteriors before removing temporaries.



FIG 39: Maxillary anterior teeth isolated with rubberdam, etching was carried out with 37% phosphoric acid for 15 secs and teeth were air dried.



FIG 40: The individual tooth isolation was done with Teflon and light cure bonding agent was applied and bonded with flowable light cure resin material with injection molding for 11, 12 and 13.



FIG 41: The individual tooth isolation was done with Teflon and light cure bonding agent was applied and bonded with flowable light cure resin material with injection molding method for 21, 22 and 23.



FIG 42: Completed maxillary anterior direct composite resin restoration.



FIG 43: A complete replica of a clear silicone index.



FIG 44: Mandibular anterior teeth isolated with rubberdam, etching was carried out with 37% phosphoric acid for 15 secs and teeth were air dried.



FIG 45: The individual tooth isolation was done with Teflon and light cure bonding agent was applied and bonded with flowable light cure resin material with injection molding method for 41,42 and 43.



FIG 46: The individual tooth isolation was done with Teflon and light cure bonding agent was applied and bonded with flowable light cure resin material with injection molding method



FIG 47: Completed mandibular anterior direct composite resin restoration.



FIG 48: A complete replica of a clear silicone index.



FIG 49: Shows post polishing of maxillary composite restoration.



FIG 50: Shows post polishing of mandibular composite restoration.



FIG 51: Shows the post-op finished and polished composite restorations of maxillary and mandibular anteriors in occlusion.



FIG 52: The post-op occlusal view of completed FMR.



FIG 53: Comparison of pre and post restorative 12 o'clock view.



FIG 54-55: Note the surface texture detailing on maxillary anteriors created



FIG 55



FIG 56: A happy patient

About the author



Dr. Smita Kole is an Aesthetic specialist, with a passion for smile designing and dental photography. She has successfully created sparkling smiles of people all over the world. She runs a multidisciplinary, well equipped modern dental practice in Solapur with all disinfection and sterilization protocols.