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Case Study

Aesthetic Rehabilitation with Direct Composite Veneering using single shade composite resin: A Case Report

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Abstract:
Tooth wear is defined as the loss of dental hard tissues caused by non-carious factors, including attrition, abrasion, and erosion, and may present as localised or generalised defects. The 2017 European expert consensus recommends delaying indirect restorative procedures and prioritising minimally invasive, additive approaches. Direct composite veneers represent a conservative and effective option for managing tooth wear, particularly in young patients, individuals with healthy dentition, or those with financial limitations. This case report describes a minimally invasive technique for the management of tooth wear associated with dental erosion and caries using single-shade direct composite veneers, demonstrating functional and aesthetic rehabilitation while preserving tooth structure.

Keywords Errosion, Minimal Invasive Dentistry, Direct composite Resin Restoration, Single Shade Composite Resin.

Introduction:

Tooth wear is described as the loss of dental hard tissues from the surfaces of the teeth caused by factors other than dental caries, trauma, and developmental disorders. Attrition (direct tooth-to-tooth contact wear), abrasion (mechanical rubbing wear), and erosion (acid dissolution excluding bacterial acidic metabolites) can all lead to tooth wear, having a multifactorial aetiology. It can be presented as generalized throughout the dentition or localized to the incisor and canine teeth.

The 2017 European expert consensus on the management of severe tooth wear recommends postponing indirect restorative treatments, such as crowns and veneers, for as long as feasible. Instead, it advocates an additive, direct, minimally invasive restorative approach, including direct composite restorations. Restorative treatment should generally be deferred whenever possible. When intervention becomes necessary and is agreed upon by the patient, a conservative strategy should be adopted. This approach should prioritize preservation of tooth structure and be supported by appropriate preventive measures to ensure long-term clinical success.

Direct composite veneers can serve as a viable option in treatment plans, particularly when conservative approaches are not only indicated but should be prioritized before considering more invasive procedures. They offer a superb alternative to full-coverage crowns, especially for young patients, those with healthy dentition, and individuals with financial constraints.

In this case report, we demonstrate a minimally invasive technique for treating tooth wear resulting from dental erosion and dental caries using direct

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composite veneers with single shade composite resin.

Case Report

A 35-year-old female patient reported to the Department of Conservative Dentistry and Endodontics, Government Dental College and Hospital, Chhatrapati Sambhajinagar, with the chief complaint of thinning of upper front teeth and wanted to get them restored for aesthetic purposes.

Clinical examination revealed erosion involving only enamel and dentin on facial surface with 11, 21 and class III caries with 11, 21 (Fig. 1). The eroded tooth surfaces were glossy and smooth. At the anterior region, the clinical crown length was diminished because of the erosion at the incisal edges

A detailed history was taken to determine the reasons of erosion. On questioning the patient gives history stated that she had been suffering from gastrointestinal problems that produce repeated exposure of teeth to gastric acids.

The teeth were not tender on percussion. Vitality of the teeth was checked using an electric pulp tester, on which they gave a normal response when compared to the adjacent and contra-lateral teeth. Radiograph of the concerned teeth did not reveal any abnormal finding.

Based on all these evaluations, direct composite resin veneers were planned using Single shade composite resin. Treatment procedure was explained to the patient and informed consent was taken.

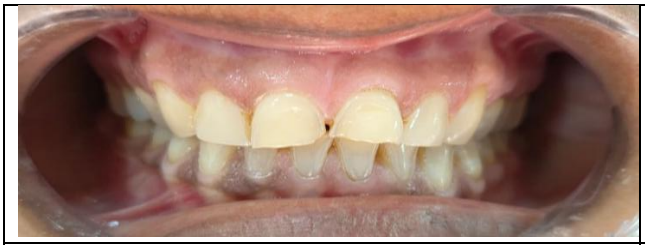

Figure 1. Preoperative Photograph

Figure 2. Rubber Dam Isolation

Figure 3. Class III Caries

Figure 4. Removal of palatal caries

A single appointment treatment plan was decided as the patient had requested for the same. Rubber dam isolation was done. (Fig 2). Removal of palatal caries (Fig 3) was done (Fig 4).

All of the exposed facial and palatal surfaces of the affected teeth were etched using 37% phosphoric acid(Fig 5) for 15 seconds followed by rinsing and drying. Application of bonding agent(Fig 6) was done after this. Single shade Composite resin was then placed in the palatal aspect in thin layer of 0.5 mm to form palatal shelf using mylar strip and cured for 30 seconds(Fig 7). Additive buildup was done by subsequently adding Single Shade composite resin superficial to this rigid palatal composite layer (Fig 8). Occlusion was checked and necessary adjustment were made which was followed by finishing and polishing.(Fig 9)

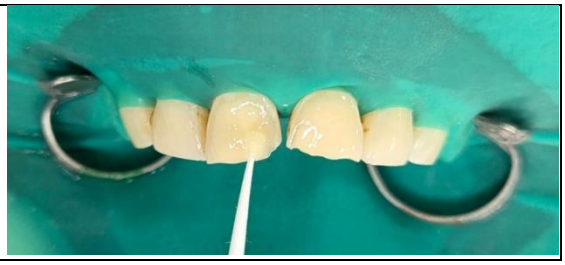

Figure 5. Acid Etching by using 35 % phosphoric Acid

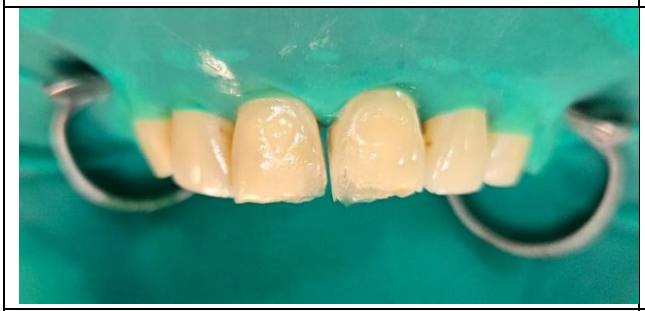

Figure 6. Application of the bonding agent

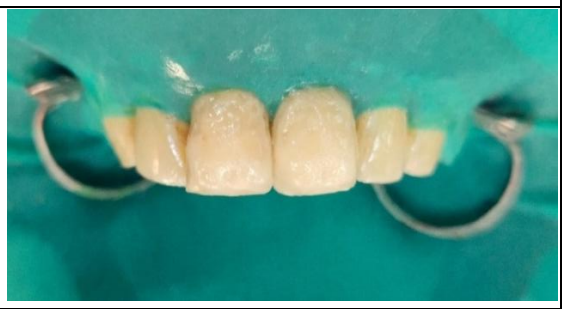

Figure 7. Palatal shelf buildup

Figure 8. Composite Resin Buildup

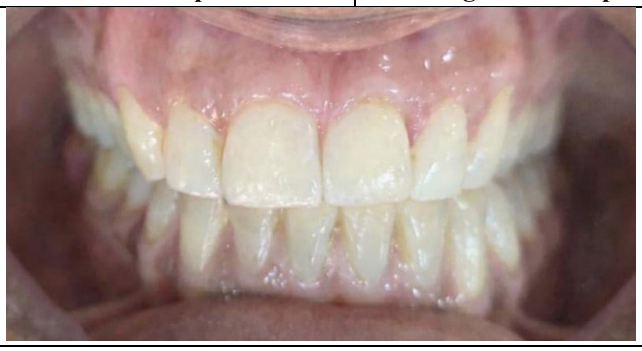

Figure 9. Post Operative Photograph

Discussion

Chemical erosion is the loss of superficial tooth structure by chemical action in the continued presence of demineralising agents. This can be prominent in patients with oral habits such as constant citrus ingestion (like lemon chewing), continuous exposure to airborne acids, chlorinated swimming pool water or gastrointestinal problems that produce repeated exposure of teeth to gastric acids. Erosion, caused by chemical irritants, can be distinguished from abrasion, caused by mechanical wear, by the location and character of the defects; eroded teeth have a smooth, glossy appearance on the facial surface

The recommended dental treatment is a direct composite restoration, in line with the European consensus on the management of severe tooth wear. Direct composite has been proposed as a minimally invasive, reversible, and additive restorative option, thereby reducing the biological cost. They necessitate minimal removal of tooth structure, and their colour and blending capabilities enable them to match almost any tooth colour and contour. Moreover, in this case the patient chose direct composite buildups as he was concerned about the high laboratory cost of ceramic crowns and wanted to keep treatment as simple as possible.

Resin composite materials are widely used in direct restorations, especially in aesthetic regions, providing good mechanical and aesthetic properties through a cost-effective and minimally invasive manner. However, achieving a seamless colour match in resin composite restorations with natural dental tissues remains a significant clinical challenge due to variations in tooth structure and background shades. To simplify selection, single-shade composites were introduced, claiming to match all VITA Classical shades through colour adjustment, blending, shifting, and assimilation. In 2020, Kulzer introduced Charisma Diamond ONE (CDO) and Charisma Topaz ONE (CTO) composites, which, according to the manufacturer, boost biocompatibility, strong clinical durability, and minimal shrinkage due to their Bis-GMA-free constitution and optimised nano-hybrid fillers.

Conclusion

Management of tooth loss can be managed by minimally invasive treatment such as direct composite resin. Careful history taking is essential in order to identify all the risk factors. A change in lifestyle with cessation of habits or erosive diet is preferable prior to restoration, but this cannot always be achieved. The patient was delighted with the

improved aesthetics and function and appreciated the relatively low financial cost.

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