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What is the ideal moment to change from composite resins to ceramics?

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INTRODUCTION

In this edition, we shall address a rather trendy topic, related to the most adequate moment to migrate from composite resins to ceramic veneers.

According to our philosophy, we firmly believe that aesthetics and functionality must always walk hand in hand, in special when the overall treatment goal is to have long term stability of the treatment. In the clinical case herewith, it was important to have the 20-year follow up of this patient, who happens to be a dentist specialized in Oral and Temporomandibular

Disorders and Orthodontics, who suffered from severe bruxism. This long term follow-up was determining in the case of this patient, who decided to choose more conservative techniques. The now 59-year-old patient has returned and wishes to improve the quality of her smile, that quite displeased her.

In situations like that, balancing aesthetics and occlusion is fundamental to guarantee patients functionality and well-being. A thorough analysis with wax-up, digital scanning and the whole functional and aesthetic planning was important and essential.

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CASE HISTORY

Female 59-year-old patient, professional colleague, presented history of severe bruxism, that had been clinically followed up by us since 1995. According to patients will, for many years we have limited ourselves to very conservative and punctual interventions given her severe bruxism and parafunctional habits, aside from using a night-guard regularly.

In 2008, in face of a severe wearing of the incisal edges of anterior teeth and the edge-to-edge bite, we have made a common decision to change our strategy towards the restorative treatment having in mind her aesthetic needs (Fig 1).

At that time (2008), our choice was for a direct composite resin work, completely altering the excursion angle of the palatal surfaces of anterior teeth, protruding the buccal surfaces and redefining a new position to the incisal edges, leading to aesthetic changes in her smile.^{1,2} The whole work was executed in composite resin. The composite brand of our preference in the occasion was Four Seasons (Ivoclar Vivadent) for the reconstruction of the palatal surfaces and incisal edges, and the finishing was done with Renamel (Cosmedent), a microbeads composite resin.

In the 2008 picture, we could observe in detail the left hemi-arch already concluded and the right one exhibiting the incisal edge with a wearing surface on teeth 11, 12 e 13 (Fig 2 and 3).

We chose to use palatal composites for we were limited to the anterior segment, not interfering with the vertical dimension of posterior teeth. The mastication contacts, functional and parafunctional movements were planned to take place over natural enamel surfaces of lower teeth.^{3,4,5}

Were we to use porcelain or ceramic restoration on the palatal aspects of upper teeth, given the occlusal impairment, after a while, this could lead to a severe wear on the enamel of the lower teeth.^{5,6} The final case can be appraised on Figure 4. In such conservative cases, biomechanics work very well by having the natural enamel of lower teeth occluding to the composite resin on the palatal surfaces of upper teeth. This restorative technique strategy has been used for over 30 years as a clinical protocol to our work, in special when we intend to improve the functional component of anterior excursion movements, with a great longitudinal follow up.

It is possible to observe in the pictures from 2017 (Fig 5 and 6), almost 10 years later, that composites did not suffer excessive wear, neither developed cracks or occlusal edges discoloration.

PLANNING

After this successful restorative attempt in 2008, and after our patients request, in 2017 we recently carried out an oral rehabilitation study, with full wax up and articulator set up

Patient had no specific TMD complaints or any other type of pain or joint discomfort. We decided to do a diagnostic wax up, as to increase the vertical occlusion and reconfigure the anatomical features that had been lost along the years, aggravated by bruxism, raising the cusps of posterior teeth and providing a balanced bilateral occlusion.

After all necessary and relevant studies, we decided to execute our work with a staged approach.



Figure 1: Picture taken in 2008 (case being followed up since 1995).

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Figure 2: Increment to the incisal edges, with buccal extension in composite.



Figure 3: Changes in excursion angle, inverting the edge-to-edge bite in teeth 21, 22 and 23 (demonstration in an altered hemi-arch).



Figure 4: Functional and aesthetic works finalized (2008) in composite resin. Four Seasons composite resin (Ivoclar Vivadent) on the palatal surface, and Renamel (Cosmedent) as the last buccal layer.

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Figure 5: Image of the final result in her smile (2017).



Figure 6: Observe the preserved incisal edges due to the changes in the excursion angle, despite the strong bruxism.

1ST STAGE

An anterior jig (deprogrammer) was manufactured in order to guide us as to how much we should raise in the posterior teeth. With the jig in position, we increase one side at a time, adding composite resin increments directly over each individual tooth, after an adhesive treatment is done on the surfaces of natural teeth and porcelains over the years. All this protocol was executed in a single long clinical sessions and we finished by adding composite to the cuspids, redefining the anterior guide.

2ND STAGE

After two weeks, when the patient was already comfortable with the strategic increase in the VD, we started the permanent work in the anterior segment, that lasted 3 clinical appointments. Preparations were done (Fig 7) from teeth 14 to 24 in the anterior segment, removing all palatal and buccal composite restorations performed in 2008 and adjusting the insertion angles of the future ceramic

restorations with interproximal preparations, all done as conservatively as possible.^{7,8,9} – preparations may be observed on the stone model and on anterior teeth of the upper arch (Fig 8 to 12).

This type of preparation is called “full veneers”, sort of a porcelain layer that covers the whole buccal surface, according to the principles of “Minimally Invasive Dentistry”. The lithium di-silicate units (e.max Press, Ivoclar Vivadent) can be visualized in Figures 11 and 12. In the same bonding session of the eight upper teeth, we have also prepared the inferiors from 33 to 43 to receive the “ceramic lens” (Fig 16), that were bonded during the following appointment, after which this treatment phase was finished.

During this stage, the whole anterior section was stabilized and organized, from both aesthetic and, in special, functional perspectives, with all excursion guides defined. One of the main factors to be taken into account is that every anterior excursion movement will happen against upper ceramic surfaces, same material of the incisals of lower teeth.

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Figure 7: Preparations in 2017, where all buccal, proximal and palatal composites were removed in order to accommodate the full porcelain veneers.



Figure 8: Lower/Upper rehabilitation strategy, with the veneer preparations.



Figure 9-12: Full veneers on stone model, from different views.



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Figure 13-15: Upper arch bonded. Analysis of the incisal edge position.

3RD STAGE

Posterior teeth were prepared and bonded with adhesive techniques in segments, according to the same conservative philosophy. Since these are very thin crowns in width, the

bonding can be done with a light curing luting agent or with thermally cured composite resin. An excellent aesthetic and biological integration of the rehabilitation work can be appraised in the final pictures.



Figure 16: In the same session, after bonding the eight veneers, we prepared and tool the impression of the lower arch as to accomplish the whole process in three sessions, with temporary crowns in the correct position.



Figure 17: Anterior protrusion after bonding the lower veneers.



Figure 18: Centric relation after bonding the lower veneers.



Figure 19: Lateral excursion to the right (excursion over porcelain in both arches).



Figure 20: Lateral excursion to the left (excursion over porcelain in both arches).



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Figure 21: Excellent aesthetic and biological integration of the final rehabilitation work.



Figure 22, 23: Pictures of patient's smile after the work was concluded.



Figure 24: Pre rehabilitation picture (2017).



Figure 25: Picture in rest position after work was concluded.

CONCLUSION

After our observations throughout the years, we are convinced that each and every patient has his/her own treatment plan according to the clinical and psychological demands. Our first option is always towards the more conservative approach possible, and this longitudinal observation allows the clinician to understand the behaviour of different materials in the oral environments of each patients. According to the needs, we can act along a stretched time window, as long as conscious and coherently, having in mind that functional stability is the ultimate goal.

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