William Kabbach

Master and Doctoral Student in Cosmetic Dentistry, Universidade Estadual Paulista, Faculdade de Odontologia de Araraquara (Araraquara/SP, Brazil).

Planning of restorations margins

In any procedure involving the application of a material to the dental structure, there will be a "transition area", whatever the restorative material, ceramics or composite resins, made by the direct or indirect technique. It is a region that involves the tooth/restoration transition area, which will always exist and is of fundamental importance to both aesthetics and long-term stability. Thus, the following question is addressed to the fellow readers: do we give, in daily practice, due importance to the planning of adhesive restoration terminations?

I am sure this is not entirely new, because, if we recall the cavity preparation classes we attended when still in college, we will remember that one of the first steps to perform preparation is to check occlusion. It is recommended to extend the preparation if its margin is located next to the occlusion area, as keeping the tooth-restoration interface in this area may lead to failure, due to the increased masticatory stress.[1]

Another example that this is not something totally new: still in college, the concept of static and dynamic areas of visibility have already been presented to us. Remember: in observing an anterior tooth - for example, the maxillary central incisor - frontally, it is possible to visualize its entire buccal face. However, when viewing the tooth in lateral view, slightly displaced mesially or distally, it is possible to view part of

How to cite: Kabbach W. Planning of restorations margins. J Clin Dent Res. 2017 Jan-Mar;14(1):22-7.

DOI: http://dx.doi.org/10.14436/2447-911x.14.1.022-027.oar

Submitted: February 11, 2017 - **Revised and accepted:** February 23, 2017.

Contact address: William Kabbach
Rua Dr. Orlando Damiano, 1964 – CEP: 13.560-450 – São Carlos/SP – Email: william@wkodontologia.com

the proximal portion (shadow area), which was not shown in front view.[2] The planning of the proximal extension of the preparations is important so that the tooth-restoration union line does not show, since the area of visibility of the tooth is dynamic.

It is observed that nowadays, with the popularization of restorative procedures with little or no dental preparation, the concern with the region of the restoration margins is neglected. I believe that this is due to the correlation between the dental preparation and the margin, a relationship that must be undone once that, even if it is possible to restore teeth without any preparation, there is still the place of the restoration margin, and this should be always taken into consideration.

There are two forms of termination when thinking of indirect restorations: one is in the form of a line and the other in the form of an area. The union line happens when we have a dental preparation with a well-defined end, and the piece termination coincides with the preparation margin. In this case, the space between the preparation and the piece (gap) is filled with the cementing agent and can be observed as a fine line. On the other hand, a union area occurs when there is no well-defined margin, and the piece is superimposed on the tooth surface, described by Andrade et al.[3] as an adhesive continuation area - the space between the piece and the tooth is filled with cementing agent which, when cured, corresponds to a wider area.

In ceramic restorations with reduced or absent preparation, where the margin is not well defined, the area of adhesive continuity will always be present and, due to its characteristics, requires a further stage of finishing of the region after cementation. This step aims to create an appearance of continuity between tooth, cementing agent and ceramics. Although this technique has already been described in the literature, it has not yet been established as a safe option from the point of view of long-term results, as they depend on the restorative material, cement, patient's habits and mainly on the region they are found - since, when in areas of easy visualization, they can compromise aesthetics.

UNION LINE X UNION AREA	
Preparation with defined margin	No defined margin
Width in micrometric order	Width in the order of tenths of millimeters
Static	Dynamics
Does not require polishing	Requires polishing
Cement color interferes little	Cement color interferes a lot
Does not require adhesive cementation	Requires adhesive cementation
Cementing agent protected by restorative agent	Cementing agent without being protected by the restorative material

At this point, diagnostic wax-up is a resource that, among other purposes, aims to plan the restoration margin region. For example, when reanatomizing anterior teeth, should the excessive buccal volume be observed, part of the wax must be removed to correct the excessive volume, which will reposition the restoration margin area on the buccal surface of the tooth (Fig 1 and 2).

In this case, one must analyze whether the positioning of the margin can compromise the aesthetic result, since the cementation of an unprepared ceramic piece will create an area of adhesive continuity. Taking into account that the aesthetic result may be impaired, tooth wearing should be performed to take the margin next to a more difficult level of visualization (proximal and gingival) in order to mask

Case 1: Composite Resin

Figure 1: Cast study model of the case to be planned.

Figure 2: Diagnostic wax-up: it is observed that, based on the waxing, the restoration margins are located in areas of easy visualization, which may compromise the aesthetic result depending on the chosen material and technique.

Figure 3: Teeth appearance in detail, before restorations.

Figure 4: Result soon after application of composite resin by the direct technique in the anterior set. Due to the apparent margins on the buccal face of the teeth, as visualized in the diagnostic wax-up, one chose to restore them in composite resin, due to the greater ease in masking the tooth/restoration margin.

the tooth-restoration union. Therefore, with the aim of preserving healthy tooth structure without creating too large restorations, it is recommended to use composite resin as a restorative material (Fig 3 and 4).

The use of composite resin as a restorative material is indicated in cases where the restoration margin is in areas of great visualization, such as the buccal surface of anterior teeth, since the finishing and polishing techniques of composite resins, besides consecrated by the literature, are simpler and can easily mask the restoration margin, giving an aspect of continuity to the restored tooth.

Case 2: Ceramics

Figure 5: Initial appearance in case of lateral agenesis: in planning, it was decided to reanatomize the lateral canines into incisors and first premolars into canines; as for the central incisors, it was chosen to cement ceramic fragments without any dental wear.

Figure 6: Immediate result after ceramic pieces cementation.

Case 1: control 5 years

Figure 7: A) In a close view, the lateral incisor aspect when restored with composite resin, one week after the finishing and polishing steps. **B)** In the same angle, lateral incisor on clinical follow-up after 5 years, where it is possible to observe a small change in tooth color in relation to the restoration, which was considered satisfactory and well maintained.

Case 2: 5-year control

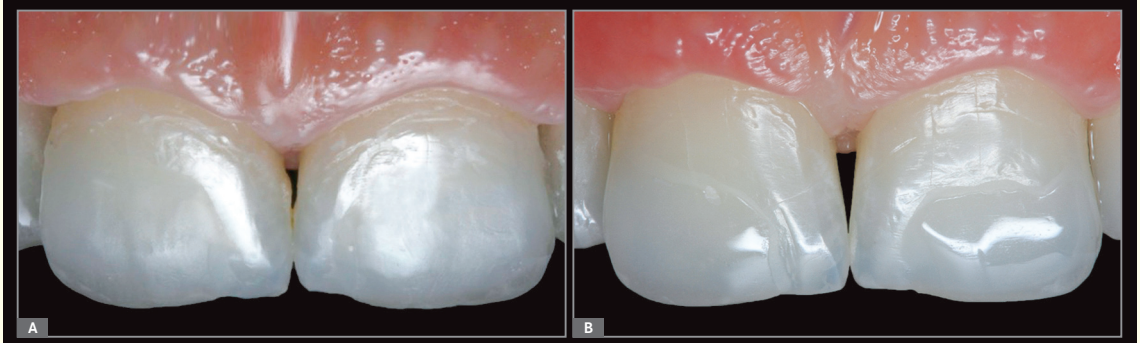

Figure 8: A) Cervicoincisal view of the maxillary central incisors with ceramic fragments cemented immediately after finishing and polishing steps. **B)** In the same angle, 5-year clinical follow-up of the ceramic fragments, where one can notice the deterioration of the adhesive continuation area, besides the appearance of the different surface glaze of the ceramic and the natural tooth: the necessary steps were taken to replace the restoration.

Figure 9: The frontal view of the case restored in ceramics, in the same 5-year follow-up session: it is observed that the image of the teeth covered with a water film can give a false impression of the behavior of the restorations.

Figure 10: Photograph in the same session, also in frontal view, but now without the water film, where the unfavorable aspect of the result in the maxillary central incisors is evident within a period of 5 years.

CONCLUSION

Considering the points hereby presented, it is of great importance to plan the restoration margins' region, whatever the technique used. However, with regard to the preservation of healthy dental enamel and in cases where the restoration margin is in areas of easy visualization, the technique of composite resins is more advantageous.

Note: The clinical cases presented here were conducted by the author himself, who believes it is also fundamental to disclose cases of failure, as a way of learning and reflection, mainly because he believes that a more real Dentistry is done through the discussion of hits and misses.

References:

1. Mondelli J. Fundamentos de dentística operatória: In Mondelli J. Fundamentos da Dentística Operatória. 2ª ed. São Paulo: Ed. Santos; 2017. cap. 111-22.
2. Bernardan JK, Baratieri LN. Facetas diretas em resina composta. In: Baratieri LN, Monteiro Junior S. Odontologia restauradora fundamentos e possibilidades. 2ª ed. São Paulo: Ed. Santos; 2015. cap. 12, p. 477-520.
3. Andrade OS, Borges GA, Kyrillos M, Moreira M, Calicchio L, Correr-Sobrinho L. Area of adhesive continuity: a new concept for bonded ceramic restorations. QDT. 2013;36:29-43.