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Dental inlays and onlays: an alternative to shell crowns

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INTRODUCTION

Inlays are prosthetic parts that can restore one or two corresponding sides of a tooth, a proximal wall and a frontal occlusion. The range of materials they can be made from is multiple: zirconium, dental ceramic, composite, noble alloys. Depending on the chosen material, it can restore only the tooth's morpho-functional qualities, or it can also restore its esthetic qualities, which have been in great demand in dentistry in recent years.

Onlays are the perfect choice over shell crowns, because they can cover two to four dental walls, dental sacrifice is much smaller than in the case of shell crowns, and their high resistance recommends them as an alternative to be considered before having recourse to well-known crowns.

Both inlays and onlays are rarely used by dentists because of the laborious procedure and long work time they entail, however, both prosthetic parts feature many more advantages than conventional obturations. Unlike known obturations, inlays and onlays retain their original color unchanged for a much longer time, healthy tooth structure is preserved in a much greater proportion than for shell crowns, and dental cleaning is much easier; inlays also restore tooth resistance lost due to the onset of carious processes.

Shell crowns entirely cover the natural crown of the tooth, which offers it protection against temperature changes occurring in the oral cavity. Their use is recommended in the case of devital teeth that no longer have an appropriate esthetics and which also have high fracture risk. In large coronary destructions it is also desirable to approach the shell crown method. Depending on the choice of materials shell crowns are made of, both their esthetics and their resistance can be restored.

For metal crowns, the more gold they contain, the more precise their adjustment on the abutment is, ensuring greater resistance over time and the avoidance of caries at its level, by not allowing bacteria to be interposed between the abutment and the shell crown.

Ceramic crowns on a metallic scaffold gives the patient much-desired esthetics, and can be used in any part of the oral cavity, the metal scaffold being entirely covered with ceramic. As in the case of non-physiognomic bridges, the larger the amount of gold in the metallic scaffold, the better the adaptation on the abutment is, and the healthier the gums are.

Ceramic dental crowns on zirconium have outstanding aesthetics compared to other conventional materials, they restore the tooth's translucency, giving a natural tooth feeling, and the number of allergies to this material is low.

MATERIALS AND METHODS

Any intervention on our part requires some steps to be followed rigorously. The cavity is prepared according to Black's well-known rules. In this case, prosthetic parts such as inlays and onlays require two visits to the dental office. The first step sees the excision of altered dentin, by completely removing altered tissues, followed by taking an impression of the cavity thus prepared, which eventually reaches the dental technology laboratory for the dental technician to cast the model which must accurately reproduce the elements in the oral cavity for which the impression was made, making the wax mockup which represents the future denture, preparing the mold, the packing mass, the packing itself and, finally, the execution of the incrustation. The second step consists of the incrustation trial and cementation in the oral cavity as prepared in the first session.

The denture mockup can be made by a direct method, i.e. by the dentist in the dental office, using a wax stick that is inserted by tamping in the cavity prepared in advance by the dentist.

The indirect method is the one approached by the dental technician. After the model has been cast, it is isolated in water; its wax mockup will be made in the cavity of the future incrustation, being then shaped and finished according to morphofunctional requisites. The removal of the mockup from the model is made with metal rods fixed to the thickest area of the mockup, rods which then serve in subsequent laboratory phases. Cutting-edge methods use optical impressions made with a small video camera that verifies the correctness of the preparation and then, through carving, the perfect incrustation is made.

Shell or covering crowns also follow a few phases, some occurring in the dental office, others in the dental technology laboratory. After polishing one or more dental crowns, inserting the retraction wire around the sub-gingival tooth to get an accurate impression, making and checking the impression and then sending it to the dental technology laboratory, the next step performed in the dental office is the metal scaffold trial, during which the marginal closure is checked, the occlusion, the resending of the metal scaffold to the laboratory for the next laboratory phase, and finally, denture cementation on the dental abutments.

RESULTS AND DISCUSSION

Both inlays and onlays can successfully replace conventional obturations, morphologically restoring tooth esthetics and functionality with a minimum use of dental tissue. Also due to dental tissue economy, they are recommended as a last resort before shell crowns.

As a result of parallels made between incrustations and shell crowns, we concluded that the former are more desirable in dental practice than shell crowns due to their multiple advantages, including increased resistance, the possibility of using them as elements of aggregation, increased economy of healthy dental tissue, protection for gums, which, in the case of shell crowns, change their color over time, and inevitably undergo gingival retraction. Incrustations can provide tight marginal closure between them and the tooth crown, which makes it impossible for secondary caries to appear.

Another important factor recommending these dental parts is much easier tooth cleaning in the case of incrustations than shell crowns. In certain cases, a shell crown can create discomfort in the patient, which does not occur for incrustations.

Although they have many advantages, incrustations also have some drawbacks, such as extended work time and the possibility of de-cementing in conditions of cement erosion or poor isolation during cementation.

CONCLUSIONS

Morphologically and functionally, incrustations successfully restore teeth affected by carious lesions, with a minimal use of dental tissue. Through their precision, they restore proximal contact points.

In periodontitis they are used as treatment for immobilization of teeth.

In cases of occlusal imbalances, they can be used as stabilizers of the occlusion, as occlusal stops.

They can be successfully used in large edentations as anchoring and supporting elements in making removable dentures.

In the case of devital teeth, shell crowns are recommended because incrustations may act as a lever, inevitably resulting in the fracture of that tooth.

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