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Basic Science Question:

What are the components of a fixed partial denture?

Report:

There are three main components of a fixed partial denture: the pontics, the connectors, and the retainer. First, the pontics. Pontics are artificial teeth that restore the function and appearance of teeth in the endentulous space. The preparation of the pontic is based on providing biologic/mastication functions as well as matching the appearance and color of adjacent teeth for esthetic purposes. The proper preparation will take into consideration multiple aspects, including essential mesiodistal width, occlusocervical distance, buccolingual dimension and location of residual ridge. These characteristics allow for the pontic to function in the prevention of tilting and drifting of adjacent teeth into the edentulous pocket. The form and shape of the gingival surface is a major component of plaque control and the ability for the patient to maintain proper oral hygiene. As a result, pontics are classified into two categories, those that have contact with oral mucosa and those that do not. Within these categories, pontics are further classified based on the shape of the gingival side of the pontic and how it is adapted to the gingival tissue. Primary designs include: sanitary/hygenic pontic, saddle-ridge-lap potnic, conical pontic, modified-ridge-lap pontic, and ovate pontic. The ovate pontic provides the best esthetical considerations, so will most likely be used in the anterior region, while the sanitary pontic is best for oral hygiene, and will most likely be considered for posterior region, as it is far more difficult for patients to access and clean this area. The santitary pontic does not have contact with the oral mucosa below and allows the patients to more easily clean the gingival area and remove food that may become lodged during mastication.

The next component of the fixed denture is the connectors. The connectors are divided into two categories: rigid and non rigid. Rigid connectors establish a fused union between the retainer and the pontics, and are locked into this configuration. All metal, rigid connectors can be made by 3 processes: casting, soldering, and welding. A casting method has the advantages of having a simpler laboratory fabrication process with fewer steps, but what it gains in this straightforward procedure is counterbalanced by its ability to be distorted more easily. The soldering method uses an intermediate metal alloy that joins the adjacent components; but, in contrast to welding, does not involve melting. Finally, the welding process joins the adjacent surfaces by melting through the use of heat or pressure. In contrast to these rigid methods, non rigid connectors are not locked into position and provide some, but very limited, movement. The different types of non rigid connectors include: dovetail, splitpontic, cross pin and wing, and loop connector. The dovetail is best for relieving stress at the midspan of long pontics, while the splitpontic consists of a connector inside the pontics that is best for tilted abutment cases. Additionally, the cross pin and wing is specialized for two pontic systems, and the loop connector loops on the lingual portion of the prosthesis and connects adjacent retainers and pontics. The non rigid connectors are created by the incorporation of prefabricated inserts into

the wax pattern, or via a custom milling procedure.

Lastly, the retainer. The retainer establishes a connection between the abutment and the bridge and prevents the prosthetic from dislodging. The retainer is directly attached to the abuntment in order provide greatest stability and both intraoral and extraoral restorations can be encorporated. The tooth that is chosen as the abutment tooth and the placement of the retainer is an important factor when determining how much the tooth should be reduced, as there is a minimum amount of material that is necessary for the prosthetic to provide the best stability. Additionally, Ante's law must be integrated. Ante's law states that "the total periodontal membrane area of the abutment teeth must equal or exceed that of the teeth to be replaced" (Balevi). This, and the mastication forces, must be examined when choosing and prepping the abutment tooth.

References:

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