

CHAPTER 3

COMPONENT PARTS OF AN RPD AND THEIR FUNCTIONS

INTRODUCTION

All definitive RPDs will have the following components: (1) a major connector, (2) several minor connectors, (3) two or more direct retainers, (4) one or more denture bases, and (5) one or more prosthetic teeth (Fig. 3-1). Each component or part one or more functions necessary for the operation of the RPD. Each type of component part has several possible designs. In this chapter the various component parts of a RPD will be defined and their functions and desirable characteristics described. In subsequent chapters the various possible designs of each component part will be discussed, and the criteria for selecting the specific design of each component part when designing a RPD will be described.

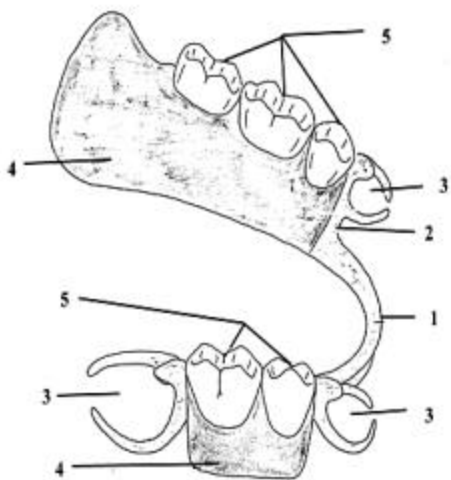


Fig. 3-1. An RPD, 1) major connector, 2) minor connector, 3) direct retainer, 4) denture base, 5) prosthetic teeth

EIGHT FUNCTIONS OF RPD COMPONENTS

Each component part of an RPD will provide one or more of the following functions:

Support: Resistance to movement of the prosthesis toward the edentulous ridge. Support is the means by which occlusal forces are transferred to the teeth and denture bearing tissues for dissipation (Fig. 3-2).

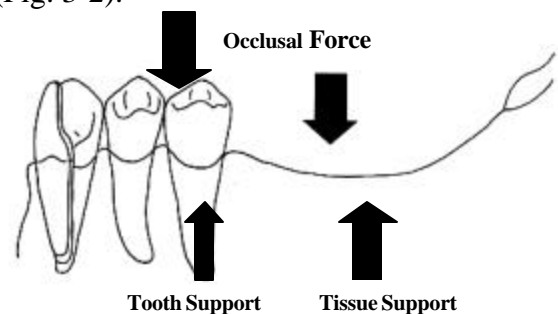


Fig. 3-2. SUPPORT-resistance to movement of a prosthesis toward the tissues

Retention: Resistance to movement of the prosthesis away from the edentulous ridge along the path of placement (Fig. 3-3).

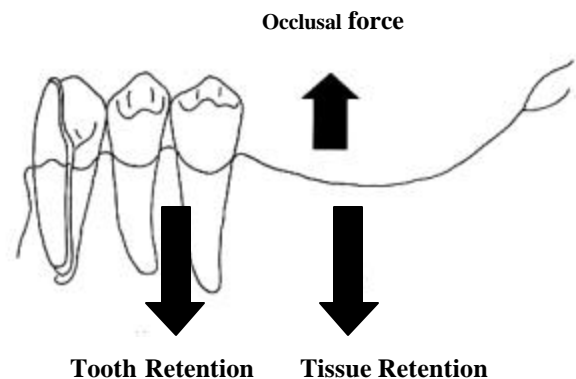


Fig. 3-3. RETENTION-resistance to movement of a prosthesis away from the tissues along its path of placement and removal

Reciprocation: The means by which forces acting on one part of a RPD are counterbalanced, counteracted or negated by another part of the RPD.

CROSS-TOOTH RECIPROICATION is the mechanism by which lateral forces generated by a retentive clasp arm passing over a height of contour are counterbalanced, counteracted, or negated by a reciprocal component passing along a reciprocal guiding plane (Fig. 3-4a-c).¹ **CROSS- ARCH RECIPROICATION** is incorporated into RPD design by opposing a retentive clasp arm on one side of the arch by a retentive clasp arm of equal force and opposite direction on the opposite side of the arch.

Bracing: The resistance to horizontal forces from mastication and the tongue (Fig. 3-5).

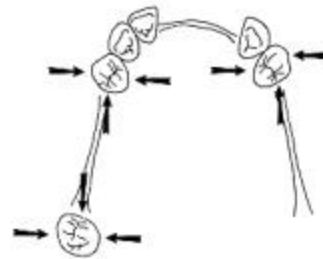


Fig. 3-5 Bracing-resistance to movement of a prosthesis in the horizontal plane

Indirect Retention: The resistance to rotational movement of a tooth-tissue supported denture base and palatal major connector away from the denture foundation area when occlusal forces (sticky foods) are applied to the denture base (Fig. 3-6).

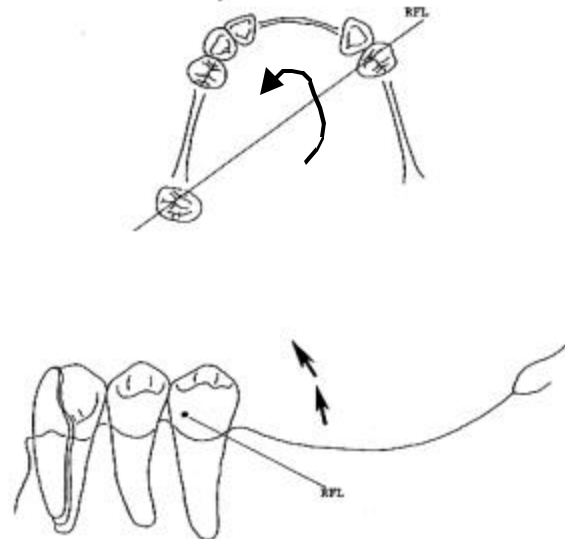


Fig. 3-6 Indirect retention-resistance to rotational movement of a tooth-tissue supported denture base and /or palatal major connector away from the denture foundation area around the retentive fulcrum line (RFL)

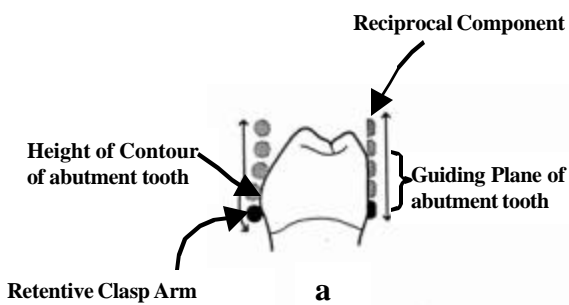


Fig. 3-4a. Cross-tooth reciprocity by means of a clasp arm on a guiding plane

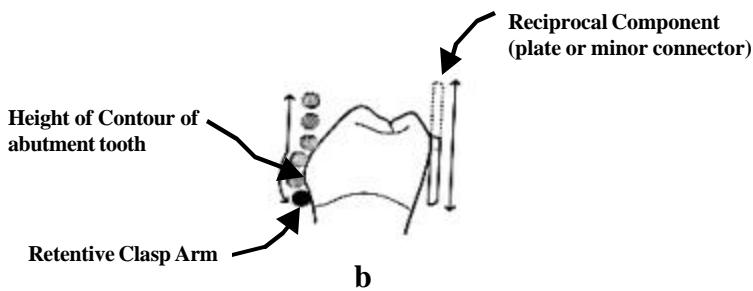


Fig. 3-4b. Cross-tooth reciprocity by means of a plate or minor connector

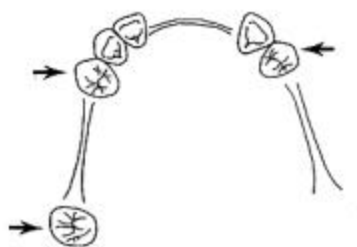


Fig. 3-4c Cross-arch reciprocity arrows representing comparable retentive forces of direct retainers

Esthetics/Occlusion: The replacement of the esthetic and functional qualities of the missing natural teeth by prosthetic (artificial) teeth (Fig. 3-7).

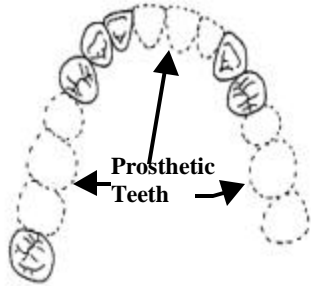


Fig. 3-7 Replacement of the esthetic and functional qualities of natural teeth by prosthetic teeth on an RPD

Connection: The means by which one component of an RPD is connected or attached to another (Fig. 3-8).

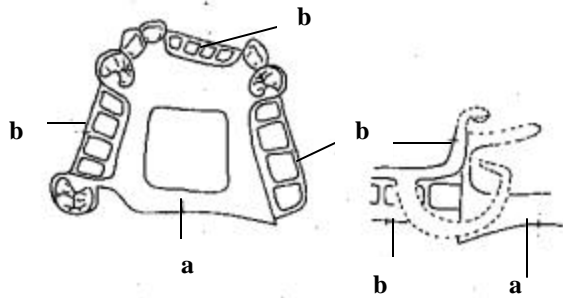


Fig. 3-8 Connection-the means by which a component part of an RPD is attached to another component, a) major connector, b) minor connector

Stability: The resistance to movement of a prosthesis due to functional forces. Stability of a RPD is obtained by all the factors which provide support, retention, reciprocation, bracing, indirect retention, occlusion, and connection. Stability also depends on the manner in which the patient uses the prosthesis (Fig. 3-9). A denture properly designed and constructed to make use of all the mechanical components of stability may not be stable if the patient functions incorrectly. Conversely, a denture, which has little mechanical

stability, may be stable if the patient functions with it properly.

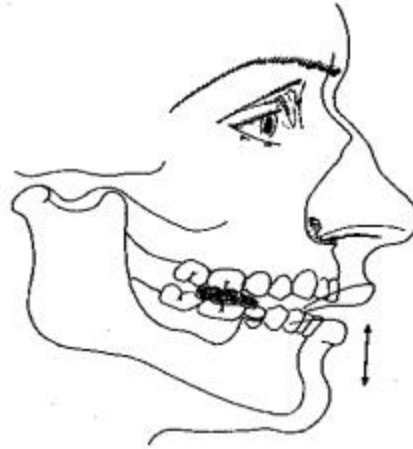


Fig. 3-9 Stability-the resistance to movement of a prosthesis due to functional forces

FIVE COMPONENT PARTS AND THEIR FUNCTION

Major Connector: That part of a RPD that joins the components parts on one side of the arch to those on the opposite side.¹ It is the unit of the RPD to which all other parts are directly or indirectly attached.² All major connectors provide the function of connection. Maxillary major connectors also provide the function of support.

Minor Connector: The connecting link between the major connector or denture base of an RPD and the other units of the prosthesis, such as clasps arms, indirect retainers, and occlusal rests.¹ Minor connectors join other parts of the RPD to the major connector.² Minor connectors in some clasp assembly designs also provide reciprocation.

Direct Retainer: A clasp assembly or attachment applied to an abutment tooth to retain a RPD in position.¹ A CLASP ASSEMBLY is the part of a RPD that acts

as a direct retainer and/or stabilizer for the prosthesis by partially encompassing or contacting an abutment tooth.¹ (Fig. 3-10).

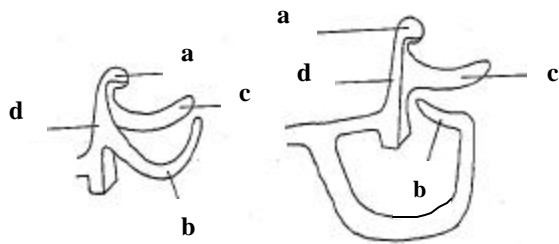


Fig. 3-10 Clasp assemblies, a) rest, b) retentive clasp arm, c) reciprocal clasp arm, d) minor connector

An ATTACHMENT is a mechanical device for the fixation, retention, and stabilization of a prosthesis.¹ (Fig. 3-11).

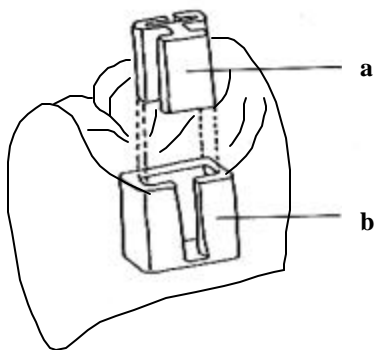


Fig. 3-11 An intracoronal attachment a) male component placed in the RPD, b) female component placed in the abutment tooth

Clasp assemblies are composed of: (1) one or more rests, (2) a retentive clasp arm, (3) a reciprocal component, and (4) one or more minor connectors. Each of the components of a clasp assembly will provide one or more functions: (1) rests provide support and if deep (occlusal-cervically) some bracing. Rests anterior to the retentive fulcrum line, with their minor connector, provide indirect retention, (2) the retentive clasp arm provides retention and sometimes

some bracing, (3) the reciprocal component may be a clasp arm, minor connector or plate and serves the function of reciprocation, bracing, and frictional retention, and (4) minor connector(s) combine the component parts into a clasp assembly and connect the clasp assembly to the major connector. They also provide bracing and some frictional retention.

Denture Base: The part of a denture that rests on the foundation tissues and to which prosthetic teeth are attached.¹ The denture base attaches the prosthetic teeth to the denture base retention minor connector which attaches the base to the major connector. The denture base provides the function of connection (Fig. 3-12). Tooth-tissue supported denture bases also transfer occlusal forces to the edentulous ridges so they provide the function of support as well.

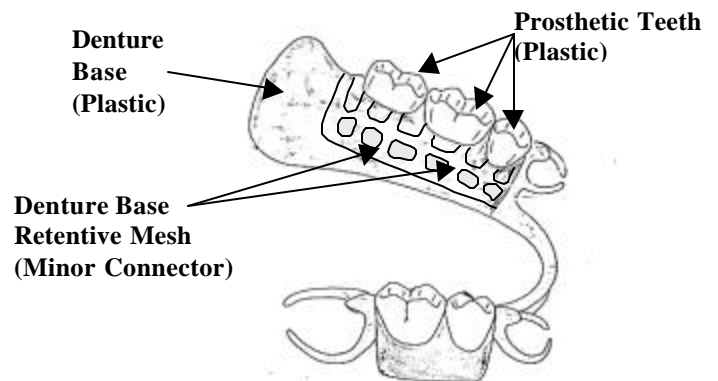


Fig. 3-12 Prosthetic teeth are attached to the denture base, which is attached to the retentive mesh

Prosthetic Teeth: Artificial teeth used on a denture to substitute for natural teeth. By substituting for the missing natural teeth, prosthetic teeth provide esthetics. The prosthetic teeth transfer occlusal forces to the denture base and subsequently to the teeth and edentulous ridges in tooth-tissue supported RPDs and thus provide the function of support.

FIVE DESIRABLE CHARACTERISTICS OF RPD COMPONENTS

Components parts of a RPD must possess the following desirable characteristics:

Must be rigid: Component parts of an RPD (except the retentive component of the direct retainer) must be rigid so that the prosthesis will function as a single unit instead of the individual parts acting separately. This way forces applied to a RPD at one place are transmitted to all teeth and tissue contacted by the denture. This cross-arch force distribution is a major advantage of RPDs over FPDs.

Must not impinge on tissue : Component parts of a RPD must be designed and located so that they will not interfere with the movements of the tissues in function. Also, the components must not interfere with the tissues as the prosthesis is placed, removed or as the prosthesis moves in function. Also, components must be designed so that they do not cause mechanical irritation to the oral tissues. There should be no sharp edges or projections. Borders should be rounded. All surfaces should be smooth and polished. The material itself and the finish and polish of the surface should result in a prosthesis which is easily cleaned with normal home care procedures.

Must be compatible with tissue : RPDs must be constructed of dental materials which are biologically acceptable to the oral tissues. They must not cause an allergic response.

Must be as self-cleansing as possible: The component parts of a RPD should be designed, constructed and located

on the teeth and tissues to avoid, as much as possible, food impaction or accumulation and to allow for the self-cleansing actions of the tongue and other oral musculature and saliva. There should be a minimum of space between the framework and the teeth and tissues.

Must be as inconspicuous as possible: The component parts of a RPD should be designed, constructed and located on the teeth and tissues, so that they will be as inconspicuous to the patient as possible. The denture should present a minimum of bulk to the tongue and oral musculature. Edges of the framework should blend in with the contours of the teeth and tissues. The surface texture of the denture should be unnoticeable to the patient.

Must cover as little tissue as possible: The component parts of an RPD should cover as little surface area of the teeth and oral tissues as possible. This way these tissues can be stimulated by food, saliva, and normal tissue movement. And, there will be a minimum of surface area of the RPD to hold plaque in contact with the teeth and tissues which could result in caries, periodontal disease and mucositis. The RPD must contact enough teeth and denture foundation area to supply support, retention, reciprocation, bracing, indirect retention occlusion and connection.

REFERENCES

1. The glossary of prosthodontic terms, 6th ed. St. Louis, C V Mosby, 1994.
2. Henderson D, McGivney G P, Castleberry D J, McCracken's removable partial prosthodontics. 7th ed. St. Louis: C V Mosby, 1985: 21 & 43