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Aesthetics in Removable Partial Dentures

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The importance of a good first impression is always understated. A smile is a gesture people perform in order to set a mood, settle a business transaction, or begin a conversation with someone. Smiling is a trait that is often overlooked because of its frequent use. A healthy smile, one that is natural, stainless and shinny portrays confidence and good hygiene. It is important and beneficial to an individual to have the healthiest and most beautiful smile that a person can have. The healthy confident smile is not appealing with many metal parts showing and plastic just setting n the mouth. Accidents happen to people that involve the loss of teeth which leads to the disruption of a healthy and beautiful smile. Through modern medicine and state of the art technology a smile can be saved.

A partial denture belongs to the category of removable prosthesis. Removable partial dentures are prosthesis made for an individual that can be removed and reinserted into the mouth at the patients discretion. A partial denture is a prosthetic restoration which usually replaces several missing teeth and derives its support from the surrounding tissue and to a lesser degree from the remaining teeth (Partial Dentures 2001). All crown and bridge prosthesis and veneers go into the category of fixed prosthetics.

At the present point in time there are two different methods of making a removable partial denture. One method is to make a metal substructure and build acrylic around it and the other method is to make a partial denture without a metal substructure using only acrylic. The patient's concerns and budget is the deciding factor that limit the technician and dentist in deciding what type of prosthesis shall be fabricated. Masticatory function and aesthetics are prime considerations in developing the design of the RPD in addition to replacing missing teeth, restoring function and improving aesthetics (Rossi et al, 2001).

Missing teeth is a severe problem for the patient. Missing teeth can cause numerous problems. Among the problems that can occur is extrusion of opposing teeth, tilting of adjacent teeth and disturbances in the overall strength of the adjacent tissues and remaining teeth (Shugars et al., 2000). Extrusion of the opposing dentition can cause severe malocclusion which can lead to devastating temporomandibular joint problems. Replacing missing teeth will restore balance to the occlusion and prohibit further occlusal and temporomandibular problems.

Restoring function to a patient's occlusion is priority one for the dentist and technician. A functioning occlusion includes restoring speech and returning the patient's occlusion to normal occlusion. A normal occlusion includes and is not limited to an absence of disease and to pathologic occlusion. Balanced masticatory forces along with a whistle free speech is the desired goal when restoring function. Aesthetics are improved by meeting the following criteria of replacing missing teeth, restoring function to the occlusion and reducing pathologic susceptibility. Aesthetics should be taken one step further than the conventional form of removable partial dentures. The conventional removable partial denture is constructed with a metal substructure and has an acrylic built. The more aesthetically correct RPD is manufactured with an acrylic base making hard to tell there is a prosthesis in the mouth and allowing for a more natural aesthetically pleasing dentition.

A major concern for most patients is aesthetics. Aesthetically pleasing removable partial dentures (RPD) is a partial denture that blends in with the natural dentition and one that does not show any indications of being a removable partial denture. Removable partial dentures made without a metal substructure are more aesthetically pleasing.

In most cases the only part of a removable partial denture that is visible are the retentive clasp arms. A new technician and product has hit the market a few years ago that eliminates the use of a metal clasp arms. The clasp arms can be made of a composite resin that can be made to look like a tooth. A clasp arm terminates in the undercut of the tooth; if the clasp is made of metal then it will be visible and aesthetically poor. A clasp made of this new composite can be made to look like a real tooth. If the technique is done properly then the clasp arms of the partial denture can be made to resemble the natural tooth and the clasp will be practically undetectable by the untrained eye.

A partial denture with a metal substructure has a severe disadvantage with regard to being aesthetically pleasing. A removable partial denture is not aesthetically pleasing because of the use of an alloy to make the substructure. The alloy does not allow the translucency that an acrylic can provide. Translucency deals with amount of transparency the substructure has. An acrylic is easier to see through than a metal is. An example of the difference of translucency between an acrylic is like looking through a sheet of tracing paper or looking through cardboard. The difference is obvious and monumental.

An alloy is metal that is comprised of many constituent metals (Applegate 1954). For example, a chrome-cobalt alloy is a metal made from mixing chrome and cobalt as well as other metals together to obtain the alloy/metal. Throughout this paper removable partial dentures made with attachments will not be discussed and are excluded.

All RPD are made with major connector, minor connectors and clasp or retentive tips. Major connectors are used to unite the separate quadrants of the partial denture. There are thirty-two permanent teeth in the mouth, a quadrant is a set of eight. Minor connectors connect the clasp arms to the major connector (Applegate 1954). The teeth

used to make a partial denture are surrounded by acrylic. There are many different types of major connectors and clasp arms. The visible parts of the removable partial denture are the clasp arms and the acrylic that surround the prosthetic teeth. The most visible parts of the RPD is the critical aspect of the removable prosthesis when discussing aesthetics and determining the aesthetic value of a removable partial denture.

Aesthetically pleasing RPD is a partial denture that blends in to the natural dentition and one that does not show indications of being a removable partial denture. The conventional method of making partial dentures is by the use of a metal substructure with an acrylic build on the metal substructure. The new technique in making RPD is to make the substructure from an acrylic base or compomers. Compomers are made from a glass ionomer cement and a light polymerized resin composite.

When I write about the new method or nonmethacrylate partial denture I am referring to the press packing removable partial denture by *Ultraflex*. *Ultraflex* is a resin material without methacrylate and can be used in a very simple manner in conjunction with the conventional method of processing a removable partial through the use of the pack and press method. The prosthesis should be waxed on the model as usual (refractory model). The three pour flasking method and boil out is followed as normal. The separator is applied as normal after boil-out. The *Ultraflex* should be mixed (five to eight min.), and packed. The packing schedule is the same as the conventional method. The flask is cured for two hours in 130° Fahrenheit and then cooled for fifteen minutes under cold running tap water. Finishing is easy. The *Ultraflex* removable partial denture is finished in the same manner as an acrylic (Aston Dental Corp.). The only caution for the use of the *Ultraflex* system is to store the *Ultraflex* material in the refrigerator until

use.

The *Ultraflex* system is very accommodating to the dental laboratory because its method of use is similar to the conventional method of making a removable partial denture. The aesthetic value of an *Ultraflex* removable partial denture is great because there is no metal. Without metal the supporting tissue can be seen. Thus a more translucent removable partial denture is reached.

Another great partial denture material that adheres to strict aesthetic value and functional restoration of the patients occlusion is the **Lucitone-FRS** offered by DentsplyTrubyte. The **Lucitone-FRS** has a major difference by the method packing the denture. **Lucitone-FRS** is not packed through the conventional method, instead it is injected into a mold. The RPD is waxed as normal than duplicated and invested into a flask by use of the two layer pour method that is used with the DentsplyTrubyte system. The duplicated model provides a mold for the resin to be injected. The **Lucitone-FRS** is aesthetically valuable and occlusionally functional.

The last of the acrylics that are on the market for removable partial dentures is the *Thermoflex* by Austenal. *Thermoflex* is a revolutionary acrylic that has the greatest variance of tooth colors and tissue color. This *Thermoflex* acrylic from Austenal is a techno polymer which is an improved acetal resin product that combines the benefits of acrylic and nylon. Among the advantages that *Thermoflex* has over the other brands is: it's weight, finishing is identical to finishing acrylic and it is monomer free. This extremely stable brand is has all the aesthetic value and functional restorative strengths that removable partial dentures should have.

Removable partial dentures that are fabricated with metal have a major problem

with blending the clasp arms into the surrounding dentition. Clasp arms usually terminate in an undercut of a tooth. The undercut of a tooth is the area under the maximum protrusion of the tooth. From a facial or frontal view, clasp arms that are made through the conventional method are easily visible (Goldstein 1976). Another major concern is the acrylic which was formed on the metal substructure and its ability to blend in with the natural dentition. A properly finished RPD has a mirror like finish which resembles a chrome bumper. The alloy is a silver color and will reflect light which will make the conventionally fabricated removable partial denture visible to the naked eye.

There are few products out there as well as new techniques that can be used to make a removable partial denture. A RPD can be made without using a metal substructure that would eliminate the obvious silver gleam that a conventional partial denture has. The removable partial denture that does not use a metal substructure is made of an acrylic that can be tinted to look like the natural gums. The conventional method has acrylic built around a metal substructure which makes the acrylic a dark color. Without a metal substructure to darken the acrylic, the tinting of the acrylic can be made more life-like and would blend with gums and natural dentition to a greater degree and be much more aesthetically pleasing.

The conventional technique of making a removable partial denture has the major advantage of the ease of cleaning and caring. All removable partial dentures have to be taken out of the mouth every night for cleaning purposes. The conventional method uses a metal substructure which is easier to clean; with the use of a denture brush and toothpaste cleaning is made simple (Caring for Your Partial 2001). A removable partial denture made without a metal substructure must be soaked every night in addition to

brushing it clean with a denture brush and toothpaste. With the conventional method cleaning is a step easier than with the new evolved technique.

Caring for a conventional removable partial denture is basically the same as caring for a removable partial denture made without a metal substructure. The advantage that a conventional partial denture has over the non methylmethacrylate partial denture is the simple fact that a metal is easier to clean than a resin. The conventional partial denture is made with metal parts has low wet-ability thus it can be cleaned of plaque and calculus build through the use of a tooth brush. The contact angle that forms from saliva and other liquids that are in the mouth determine the wet-ability of the substructure. The lower the contact angle the lower the wet-ability and the easier to clean.

To clean a conventional partial denture should: be removed from the mouth at night preferable, brushed with a denture brush and toothpaste along with flossing in between the teeth on the partial. Occasionally the partial denture should be soaked in a disinfectant or a mouthwash (Caring For Your Partial 2001). Another advantage a conventional partial denture has over the resin or nonmethymethacrylate denture is its advantage to deter bad odor build on the denture. A resin or plastic has microscopic pores that can trap plaque and bacteria that can produce bad breath.

Conventional removable partial dentures are at a severe disadvantage of being aesthetically pleasing because of the metal substructure. The instant that a substructure is made from a composite or acrylic then a partial denture becomes more aesthetically pleasing. An aesthetically pleasing partial denture is a partial denture that blends in to the natural dentition and a removable partial denture that does not show any indications of being a removable partial denture.

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