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Sterngold Attachments™

A multi-attachment approach to partial dentures

You're considering doing your first attachment case.

With the ever increasing number of attachments on the market, you've tried to stay as current as possible. But there are now more than 150 connectors available, so the task of choosing an appropriate attachment for the first case may seem overwhelming.

To make some sense of this apparent chaos, you should understand how to categorize attachments by application, function, and size. With such an understanding, you can easily use a process of elimination to select an appropriate attachment for virtually any case - whether you're choosing from 20 or 200 different connectors.

First, categorize the attachment by type of restoration.

All attachments fall into one or more of three categories based on the type of restoration they're designed for: partial denture, overdenture, or fixed/segmented. This means that a quick glance at the study models generally lets you dismiss a majority of potential candidates.

Within these categories there are subdivisions which allow you to further categorize the connectors. These divisions involve the specific design of the attachment, the attachment's degree of precision, and, most important, how the attachment distributes forces (Table 1).

Okay, you have them categorized. Now what?

Using this system you can categorize virtually any attachment. Your purpose in categorizing it is to isolate the connector, understand how it works and where it can or can't be used.

The function category you turn to for any particular case depends on just two considerations. One is your personal philosophy of case design and the other is the condition of the specific oral cavity.

If you believe in maximizing tooth support (that is, you rarely use stress breakers, are favorably disposed toward guide planes and tend to splint remaining dentition) your decision for a partial denture is an easy one. In the majority of cases, you will probably use an intracoronal, non-resilient attachment like the Stem Latch or C&M McCollum.

On the other hand, if you prefer to emphasize the supportive role of the tissue (that is, you make extensive use of stress-breakers) you'll probably prefer a resilient attachment. The question then is, "How much resiliency and what kind of movement?' If you prefer distal hinging only with the prevention of lateral movement and posterior lift-off, you will use a lot of Dalbo attachments. If you prefer that the joint between the abutment and the prosthesis allow slight movement in all directions, you will be more inclined to use a universal joint like the Stern ERA or Octolink.

TABLE 1 - AN APPROACH TO CATEGORIZING ATTACHMENTS

A) Removable Partial Dentures
  1) Intracoronal or Extracoronal
  2) Rigid or Resilient
  3) Precision or Semi-precision
B) Segmented Fixed Bridgework
  Precision or semi-precision
C) Overdentures
  1) Bars
    a) Joints or units (resilient or rigid)
    b) Precision or semi-precision
  2) Radicular studs
    a) Rigid or resilient
    b) Replaceable or adjustable parts
  3) Intraradicular anchors

Notice that your design philosophy precedes your involvement with attachments. It depends on your education and experience. The attachment doesn't influence your philosophy. Your philosophy influences which attachment you choose.

If you have a strong philosophical orientation like this (rigid or resilient), the attachment you select won't vary much from case to case. The key question for any particular patient will be, "Does this case allow enough room for the attachment?"

But we've found that most dentists and technicians don't have this strong design philosophy. They prefer instead to use different attachments to fit the condition of the oral cavity. Obviously, these dentists have a somewhat larger arsenal. But even here, with a little effort and research they should be able to establish an arsenal of no more than eight to ten attachments.

Analyzing the study casts and x-rays

The two most important considerations when selecting attachments to fit a particular oral cavity are the amount of periodontal support for the abutments and the condition of the non-abutment supportive structures (residual ridge, buccal tuberosities, etc.). You should consider the number of abutments, their placement, crown-root ratios,

their vertical height, pulp size, etc.

Table 2 lists some things you should consider when evaluating the oral cavity and suggests their influence on attachment selection. Though the considerations will sometimes point unanimously to a specific design, more often the study casts will offer conflicting indications. These require judgment, and that's why case design can never be a purely mechanical operation.

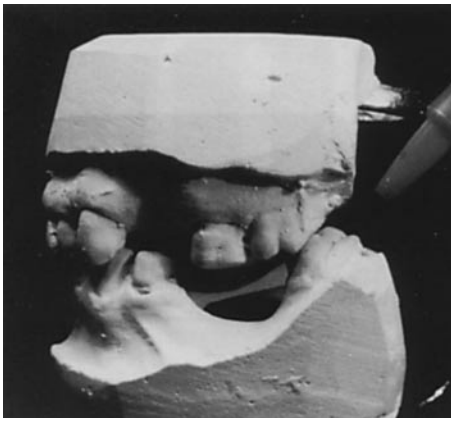
Nevertheless, the study model will usually fit your categorized attachments close enough to permit relatively easy selection.

Here are some partial denture examples that show how the amount of periodontal support and condition of the ridge can influence the attachment selection.

CASE 1	CONDITION
Periodontal support	Good
Residual ridge	Good

Unfortunately, you don't see this situation often. Whether you select an intracoronal rigid or extracoronal resilient attachment, precision or semi-precision, this case will have an excellent chance for success.

So the attachment you select will depend on the other considerations in Table 2. If the size and number of abutments in the opposing arch do not direct you toward a particular attachment design, we suggest a nonresilient attachment, because it generally shows less long-term wear than a resilient design.



CASE 2:	CONDITION
Periodontal support	Good
Residual ridge	Fair/Poor

There is no such thing as a totally tissue-borne or totally tooth-borne prosthesis. The difference between resilient and non-resilient is really a matter of emphasis. Since the tendency of resilient attachments is to direct the majority of the load to the ridge, you might prefer a non-resilient design for a situation like this. Which non-resilient attachment? For that you'd turn to the other considerations in Table 2.

For example, if the bite is close you might select the Stern Latch, whose latching mechanism makes it particularly useful where vertical height is limited. If the patient suffers from arthritis, a tapered attachment like the PD (Plastic Dovetail) might be indicated.

CASE 3:	CONDITION
Periodontal support	Fair/Poor
Residual ridge	Good

In the reverse of Case 2, you're more concerned with keeping stress away from the abutments. (This is particularly true if the partial is free-end). You will probably consider a resilient design. Which resilient? Again, review the other considerations in Table 2. For example, if only anterior abutments remain (so the attachments diverge), you'll choose a universal joint design. If on the other hand, the attachments can be approximately paralleled, you'll probably prefer a resilient attachment that allows only restricted movement (such as the Dalbo). This will limit possibly destructive lateral movement.

CASE 4:	CONDITION
Periodontal support	Poor
Residual ridge	Poor

Here you face the all-around bad situation. Resilient or non-resilient partial denture attachments have an equally poor prognosis. The resilient, because it might damage that vulnerable ridge. The non-resilient, because it might overload the weak abutments.

We could consider an alternative such as ridge augmentation, and select an extracoronal attachment. However, that would be both expensive and traumatic for the patient. Instead, why not create a more favorable crown-root ratio by reducing the clinical crown height of the poorly supported abutment and then use an overdenture type attachment? This will reduce torque on the remaining periodontal support, and if other abutments fail at some later date, the overlay partial denture could be replaced with a full overdenture at only a minimum additional expense.

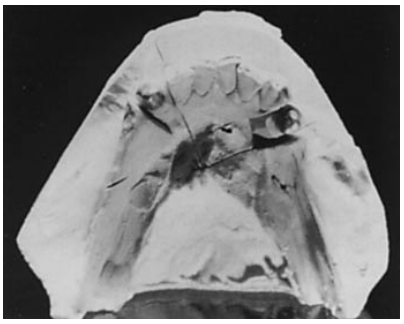
To many dentists and technicians attachments seem too complicated for general use. However, we believe that by using a classification system and a simple process of elimination, you can make sense out of apparent chaos.

TABLE 2-CONSIDERATIONS WHEN SELECTING ATTACHMENTS

Considerations	Significance
Condition of periodontal support	When teeth are strong, or can be made strong through splinting, non-resilient designs are the connectors of choice.
Condition of residual ridge and other soft tissue support	A residual ridge showing evidence of rampant resorption generally contraindicates resilient designs.
Opposing arch	Two resilient prostheses should generally not oppose each other, as two mobile occlusal planes will impair chewing efficiency.
Vertical height (measured from soft tissue papilla to the occlusal surface)	Every attachment has a minimum height requirement; for example, most intracoronal designs require at least 3.5mm and preferably more.
Size of abutments	A large pulp chamber or very small mesiodistal dimension may contraindicate an intracoronal design.
Strength of bite	Virtually all attachments will withstand a normal bite. But when faced with strong bruxing, avoid small, dainty attachments.
Number of abutments	Double abutting distal extension cases is always a good idea; however, when not possible, resilient designs are preferred to de-emphasize the supportive role of the abutments.
Position of abutments	Attachments with a restricted hinging action, like the Dalbo, must be approximately parallel not only vertically, but also along the ridge so the hinges can function in unison. If a hinging design is desired, and position of abutments prevents parallelism along the ridge, a universal joint such as the Stern ERA or Octolink is preferred.
Patient dexterity	Extracoronal attachments are generally a bit easier to insert than intracoronal. Of the intracoronal designs, tapered attachments are easier than parallel-walled attachments.
Alloy from which the abutment crown will be made	Some attachments must be used only with precious metal. Others only with non-precious alloys.

Selecting Attachments-A Process of Elimination

Once you get in the habit of categorizing attachments, you can quickly reduce the number of candidates for any particular case by asking a series of questions based on the criteria listed in Table 2. For example, in this instance, 7 questions reduced the number of potential attachments from 36 to just 3.



Possible attachments—

BEYELER
BILOC – PLASTA
C & M MCCOLLUM
COMBI-SNAP
CROSS ARCH ROACH
DALBO MINI UNILAT.
DALBO STANDARD UNILAT.
DALLA BONA - CLY. RIGID
DALLA BONA - SPH. RESIL.
DOLDER BAR- RESILIENT JOINT
DOLDER BAR- RIGID UNIT
ERA DIRECT OVERDENTURE
ERA OVERDENTURE
ERA-RV
ERA-RV 2.5 OFFSET
ERA-RV 4.5 OFFSET
HADER BAR
HADER VERTICAL
IC ATTACHMENT
INTERLOCK
LOCKING SCREW
MICRO ERA
MICRO ERA OVERDENTURE
OCTOLINK – MINI
OCTOLINK - MINI BAR
PD - PLASTIC DOVETAIL
ROTHERMANN - RESIL.
ROTHERMANN – RIGID
ROUND BAR & RIDER
SCHUBIGER
STERN LATCH
STERN ROOT ANCHOR – MINI
STERN ROOT ANCHOR - STD.
TUBE & SCREW
TUBE LOCK – LARGE
TUBE LOCK – SMALL

"What kind of case is it?"

- ☑ Partial
- ☐ Overdenture
- ☐ Segmented

Possible attachments—Partial denture attachments only.

BEYELER
BILOC – PLASTA
C & M MCCOLLUM
COMBI-SNAP
CROSS ARCH ROACH
DALBO MINI UNILAT.
DALBO STANDARD UNILAT.
ERA-RV
ERA-RV 2.5 OFFSET
ERA-RV 4.5 OFFSET
HADER VERTICAL
IC ATTACHMENT
MICRO ERA
OCTOLINK – MINI
OCTOLINK - MINI BAR
PD - PLASTIC DOVETAIL
STERN LATCH

"What is the dentist's philosophy of loading"?

- ☐ Non-resilient primarily
- ☐ Resilient primarily
- ☑ Non-resilient or resilient depending on the case

Possible attachments—In this case, we will consider ALL partial denture attachments (as in the above list).

"What is the condition of the ridge?"

- ☐ Good
- ☑ Fair–choose resilient or non-resilient
- ☐ Highly resorbed

"What is opposing the prosthesis?"

- ☐ Complete denture
- ☐ Clasped partial denture
- ☑ Natural dentition or fixed bridgework–choose resilient or non-resilient

"What is the condition of the remaining periodontal support?"

- ☐ Strong
- ☐ Fair
- ☑ Weak–choose resilient

Possible attachments—Only partial denture attachments of resilient design.

DALBO MINI UNILAT.
ERA-RV
ERA-RV 2.5 OFFSET
ERA-RV 4.5 OFFSET
HADER VERTICAL
IC ATTACHMENT
MICRO ERA
OCTOLINK – MINI
OCTOLINK - MINI BAR

"How much space is there?"
4mm

Possible attachments—Only resilient partial denture attachments that fit in 4mm

DALBO MINI UNILAT.
ERA-RV
HADER VERTICAL
IC ATTACHMENT
MICRO ERA
OCTOLINK – MINI
OCTOLINK - MINI BAR

"Where are abutments located? Can the attachments be paralleled along the ridge?"

- ☐ Yes
- ☑ No

Possible attachments—Only resilient partial denture attachments that fit in 4mm and permit universal hinging.

ERA-RV
MICRO ERA
OCTOLINK-MINI
