Maxillofacial Stents

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5th year
5/4/2020
STENTS

- **Stents** are appliances constructed to cover the tissues and/or the teeth, *used for protection, to carry medicaments, radium for radiation, or to control bleeding.*

Fig. 1. Charles Stent, 1807-1885.
**Uses**

- **They are used for:**
  - 1. Carry medicaments and surgical packs to required areas in the oral cavity.
  - 2. Help to control bleeding, especially in hemophilic patients.
  - 3. Protect the tissues after skin and mucosal grafts and keep them in place.
**uses**

- 4. Protect teeth and associated structures in contact sports.
- 5. Carry radium materials and keep them in place for treatment of malignancy.
- 6. Preserve the depth of the vestibules after sulcus deepening and ridge augmentation.
- 7. Promote healing and prevent wound contamination.
• **Materials used**

• **1. Acrylic resin:** heat curing or self-curing resins,

• **2. Soft materials:** Soft rubber or soft resins and silicone.

• **3. Modeling plastic:** black gutta percha.
Materials Used for Stents
1. Oral Screen
Mouth Breathing

It is the habitual respiration through the mouth instead of the nose.
It is also termed as Oro-nasal breathing.
Mouth Breathing

• **Etiology:**

• 1. *Respiratory obstruction:* as chronic rhinitis, enlarged tonsils or adenoids, and deviated nasal septum (Obstructive sleep apnea syndrome is also characterized by mouth breathing)

• 2. *Habitual* mouth breathing as thumb sucking.

• 3. *Anatomical:* due to
  - A. Short upper lip.
  - B. Anterior upper teeth protrusion.
Mouth Breathing

- **Effect of mouth breathing:**
  - 1. Protrusion of upper anterior teeth, and open bite.
  - 2. Constricted maxillary arch and posterior cross bite
  - 3. Gingival and tongue inflammation due to dryness of the mouth.
  - 4. Fry mouth.
  - 5. Open lip (lip apart posture) and everted lower lip.
  - 6. Increased anterior face height.
Mouth Breathing

Gingival inflammation
Mouth Breathing

**Treatment considerations:**

1. Treat the cause first.
2. Eliminate the nasal obstruction by referring the child to ENT specialist.
3. Dental treatment
Mouth Breathing
Oral Screen

• It is a stent of acrylic resin worn usually at night and is bounded by the lip and cheek laterally and by the teeth medially. It is used to stimulate proper nasal breathing, besides controlling finger and thumb sucking or lip biting. It may also be considered as an orthodontic appliance for protrusive upper incisor teeth by which the pressure is applied.
Mouth Breathing
Oral Screen

- **Construction:**
  - Impression are made including the buccal and labial folds. The models are articulated in centric occlusion. A double thickness of wax is adapted on labial and buccal surfaces of the models, extending to the limits of buccal fold and freeing frena and any muscle attachments. The screen is processed in clear acrylic resin.
Tongue Thrust and Thumb Sucking

Treatment
Instruction of the patient.
Tongue habit appliance (tongue crib)

Tongue Sucking

Thumb Sucking

Lip Biting

Finger Sucking
• **2. Bite Guard**
  *(Mouth piece)*
2. Bite Guard (Mouth piece)

- **Bruxism:**
  It is a parafunctional grinding of teeth.
  It is one of the most common sleep disorders

- **Clinching:**
  The pressing and clamping of the jaws and teeth associated with acute nervous tension or physical effort.
2. Bite Guard (Mouth piece)

- Symptoms of Bruxism:
  1. Abraded teeth lead to
  2. Oversensitivity of the teeth
  5. Dislocation of the jaw.
  6. Clicking in TMJ.
  7. Tongue indentation.
  8. Damage of inside surface of the cheek.
2. Occlusal Devices Splint or Stent or Bite plate or Bite guard

- It is removable artificial occlusal surface used for diagnosis or therapy affecting the relationship of the mandible to the maxilla. It may be used for occlusal stabilization, for treatment of T.M.J disorders, or to prevent wear of the dentition.
2. Occlusal Devices Splint or Stent or Bite plate or Bite guard

- After proper diagnosis and evaluation of the occlusion, upper and lower impressions are made and poured. Interocclusal records are made for mounting of casts on an articulator. The articulator is opened slightly for a new vertical dimension. The proper thickness of wax is adapted to the occlusal surface of the upper or lower cast and extends to the buccal and lingual surfaces of the teeth till their high of contours. Hard or soft material may be used as acrylic and rubber.
2. Occlusal Devices Splint or Stent or Bite plate or Bite guard
2. Functions of Occlusal Devices Splint or Stent or Bite plate or Bite guard

- The primary function of occlusal device is to adjust occlusal discrepancies that cause a painful myospasm.
  - 1. Eliminate occlusal interferences.
  - 3. As a guide for the mandible into retruded position for treatment of T.MJ dysfunction syndrome.
2. Types of Occlusal Devices Splint or Stent or Bite plate or Bite guard

• **1. Smooth flat occlusal surface** for relaxation by allowing contact of all opposing teeth.

• **2. Indentation and/or ramps** for mandibular reposition device.

• **3. Soft device** is more comfortable to patient with bruxism or clenching to distribute the pressure equally.
BITE PLANES

It is a shelf of acrylic added to the baseplate to clear the occlusion or to reduce the overbite if it interfere with tooth movement.
TYPES OF BITE PLANES

1. Anterior bite plane.
2. Posterior bite plane.
1. ANTERIOR BITE PLANE

> It can be used when the occlusion interferes with tooth movement or when we have deep bite.

> They are usually flat & parallel to the occlusal plane.
1. Enough height to disocclude posterior teeth 2-3 mm.
2. Enough width to occlude with lower incisors when the mandible is Retruded.
3. It should not encroach tongue space.
POSTERIOR BITE PLANES

INDICATIONs:

1. Reduced or average overbite.
2. Reversed overjet.
3. Unilateral posterior crossbite.
REQUIREMENTS:

1. It should be thin.
2. It has to be wide enough to cover buccal & lingual surfaces.
3. Occlusion should be equal in both sides.
3. Stents for alveolar ridge plastic surgery

- Surgical stents are used in conjunction with surgical deepening of the mucobuccal vestibule and for holding mucous membrane and skin grafts (vestibuloplasty). This stent is also used with ridge augmentation procedures to maintain the ridge height.
3. Stents for alveolar ridge plastic surgery

- **Ridge augmentation:**
- It is a surgical procedure performed to increase the size of the ridge by using bone grafts or alloplastic grafts.
3. Stents for alveolar ridge plastic surgery

**Vestibuloplasty: Sulcus deepening procedure:**
A surgical procedure designed to restore alveolar ridge height by lowering muscles attaching to the buccal, labial and lingual aspects of the jaws.
3. Stents for alveolar ridge plastic surgery

- **Technique:**
  - Impressions are made and stone casts poured and duplicated. The sulcus is modified by deepening to the required depth on the cast, and the surgical stent is made from a clear acrylic resin to fit the modified cast.
  - The stent is fitted in the operating room immediately after surgery and wired if it is advisable.
  - The stent is kept for few weeks until complete healing takes place and the patient is advised to keep it in his mouth until the restoration is finished.
3. Stents for alveolar ridge plastic surgery
3. Stents for alveolar ridge plastic surgery
4. Antihemorrhagic Stent

- Such stents can be constructed in clear resin with suitable relief to accommodate the hemostatic agent for patients have a history of severe bleeding or hemophilic patients after extraction.
4. **Antihemorrhagic Stent**

**Construction**

- Before surgery the impressions are made and the casts are mounted. The tooth to be extracted is removed from the stone cast. A layer of molding wax is adapted on the cast to cover the buccal and lingual surfaces and the top of the ridge. The articulator is closed to allow the opposing teeth to touch the top of the wax. Process the wax in clear heat or cold cure resin. Clear resin makes inspection and detection of pressure spots easy. The stent is inserted immediately after extraction. Bleeding is controlled as the patient closes and applies gentle pressure over the extraction site.
4. Antihemorrhagic Stent

- In hemophilic patients a stent could be of great help in the arrest of bleeding, but here no pressure should be applied. They are designed only to protect the socket and blood clot from the tongue and to hold a hemostatic dressing in place. It can be left in the mouth for a week or even more if needed. Such stents can be relined with soft resin.
5. **Palatal stent or palatal pressure plates**

- It is a simple acrylic plate covered the palate used for palatal surgery. e.g. palatal mucosal grafting or surgical removal of palatal tori. It facilitates hemostasis and protects the healing of raw surface of the palate.
5. Palatal stent or surgical stent or palatal pressure plates
4. *Palatal stent or surgical stent or palatal pressure plates* construction

- Alginate impression is made before surgery. The palatal tori are scrapped on the cast, and palatal plate is constructed on the modified cast to cover the palate with wire clasps before surgery. After surgery the plate is inserted in the mouth lined with conditioning material. It may be left in the mouth from 2-7 days.
4. Palatal stent or surgical stent or palatal pressure plates
5. Nasal Stent

- A removable intranasal prosthesis used to support the form of the nose after correction of nasal deformities in cleft lip patients. Modeling plastic is used to develop the desired contours of nares.
5. Nasal Stent
• 6. Mouth guard or mouth protector for contact sports
6. Mouth guard or mouth protector for contact sports

• A resilient intraoral device constructed to protect the teeth and surrounding structures from injury during contact sport as boxing. The stents are made to fit the upper arch and covered the occlusal surface to about 3-4mm to absorb the impact.
MOUTH GUARD

- It is an appliance that has different terminologies such as (Bite guards, Night guards, Guide splints, Stints & Others).
- It is a removable appliance constructed to fit over the dentition.
- It is used for a therapeutic relief for TMJ symptoms or muscle complaints or to protect teeth from accidental injuries.
6. Mouth guard or mouth protector for contact sports

- Impressions are made for every player and the casts are poured. Soft cured material is used that is applied by a brush in layers. Silicone sheets are used that are adapted to the cast by using a vacuum machine and the excess are trimmed by sharp scissors.
6. Mouth guard or mouth protector for contact sports
MATERIAL USED

- Clear acrylic resin.
- Wrought orthodontic wire clasps to increase retention.
TYPES OF MOUTH GUARDS:

1. Preformed such as:
   - Stock mouth guard.
   - Mouth guard protector.
   This type provides protection for athletic people but they are inaccurate & should be temporarily used.

2. Custom made
   This type is constructed by a dentist which makes them more accurate & comfortable to the pt.
REQURMENT FOR MOUTH GUARD

1. It should cover the entire occlusal surface of the teeth with a thin layer of acrylic resin to:
   a. Provide maximum tooth contact.
   b. Prevent elongation or depression of teeth.

2. The occlusal surface should be narrow & flat.
3. It should maintain a uniform contact in centric relation & immediate disocclusion in eccentric mandibular movement.

4. Missing teeth should be incorporated into the mouth guard.

5. All tissue contacting surfaces should be smooth & polished to prevent tissue irritation.
6. If dental arches are malaligned, or if there is no posterior support in the mandibular arch, night guard should be constructed for both dental arches to provide stability.

7. It should not interfere with breathing & speaking.
PURPOSES OF MOUTH GUARD

1. To relieve TMJ symptoms & muscle spasm.
2. Migraine headaches.
3. To create an asymptomatic pt, to permit true hinge axis opening & lateral border movement without neuromuscular interference.
PERIOD OF WEARING MOUTH GUARD

> It is usually 4-6 weeks prior to functional analysis procedure or location of hinge axis & mandibular movement.

> Recall after 3-5 days to check if there is any shiny facets which should be removed especially in molar areas.

> Usually the guard is placed in the maxillary arch except in CL III malocclusion it will be in mandibular arch.

> If there is any missing teeth guards will be fabricated in both arches.
CLINICAL INSTRUMENTATION

1. Perforated upper & lower tray.
2. Alginate impression.
4. Rubber bowel.
5. Measuring cup.
6. Wax bite.
7. May be face bow transfer.
INSERTION

Mouth guard should have certain acceptable criteria:

1. Close adaptation to anatomic structures.
2. Uniform thickness.
3. Smooth peripheral borders.
4. Extended to maxillary tuberosity.
5. Should not impinge on vestibular or gingival tissues & frenum.
INSTRUMENTS NEEDED DURING INSERTION

1. Slow speed hand piece.
2. Acrylic bur.
3. White stone bur.
4. Articulating ribbons (Red, Blue, Green)
7. Radiation Appliances

- Radium applicators and protectors are considered as stents
Radiation Protector
Delayed Effects of Radiation on the natural teeth
Delayed Effects of Radiation
8. Cyst plugs

- Constructed to prevent closing of the opening of the cyst before complete healing of its cavity after marsupilization. The plug fits the neck of the cavity and prevents its healing before the main body of the cyst is completely healed. The cyst is plugged with gauze or wet cotton wool leaving the neck part of the cavity free.
8. Cyst plugs

Construction

- Impressions are made and a cast is produced with a small depression representing the cyst neck. The plug should have a labial and buccal flange with an acrylic projection in the cyst cavity but not to the full depth. Gradual reduction from the depth of the acrylic plug until it is almost removed entirely, as the cyst cavity will be decreasing in size.
9. **Drainage stent**

- The purpose of a drainage stent is to allow the escape of blood or tissue fluids from chronic periapical lesions through a fistula for drainage of infection.

- An impression is made and the fistula is reproduced and marked on the stone cast. A polyethylene tube is inserted in the hole and the labial aspect of the cast is covered with two layers of wax. Then the stent is processed with clear acrylic resin and cured in conjunction with the polyethylene tube and polished.
10. *Periodontal stent or labiolingual stent*

- It holds the periodontal dressing in place during the healing phase.
11. Burn Stent

- A device constructed to minimize contraction of burned tissues during healing, minimizes post burn scaring and the development of microstomia.
- Diagnostic impression of the recently burned patient are made with alginate impression materials. Even after initial healing, the impressions are poured in artificial stone to create casts from which various stents or splints and exercise device can be fabricated.
- Contracture of wound margins does not usually begin until about 5 days after injury.
11. Burn Stent
THANK YOU