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RESEARCH ARTICLE

BAND AND LOOP SPACE MAINTAINER: A REPORT

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Abstract

Space maintainers have been used in Pediatric Dentistry for many years. The use of these appliances, however, in terms of indications, contraindications, design and construction has gained little attention from researchers.

Aim: This study enlighten the construction of a new technique of fabrication of band and loop space maintainer.

Introduction:-

Consequence of proper or improper space management influence dental development in childhood to well into adolescence. Early loss of primary teeth may lead to compromise in the eruption of succedaneous teeth if there is a reduction in the arch length. In some case; if timely intervention is undertaken with space maintainers it may save space for the eruptions of the permanent dentition. The key to space maintenance in the primary dentition is in knowing the basic problem and cause of the problem to treat. Premature tooth loss is in terms of anterior (incisors and canine) and posterior (molar) is cited according to the basic etiology of the premature loss[1].

Etiology of anterior tooth loss is as follows:

1. Trauma.
2. Tooth decay.

Trauma:

Injuries to the primary incisors are common because child in this age is learning to crawl, walk and run.

Tooth decay:

Although the prevalence of dental decay appears to be declining; a small number of children still suffer from early childhood caries and rampant decay.

Etiology of posterior tooth loss is mainly due to dental caries; rarely are primary molars lost due to trauma.

Space maintenance during the primary dentition years is aimed primarily at the replacement of primary molars for the reason that:

Loss of interproximal contact as a result of decay, extraction, or ankylosis of an adjacent tooth result in space loss because of mesial and occlusal drift of the tooth distal to the newly created space. There is also an evidence that the tooth mesial to affected molar will drift distally into the space. Therefore, loss of space or arch length is possible and can occur from both directions. But early loss of primary incisor does not result in space loss as seen in many

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clinical situations. There may be some re-arrangement of space between remaining incisors but there is not space loss.

Also space maintenance begins with good restorative dentistry.

The clinician should strive for ideal restoration of all interproximal contours, early restoration of interproximal caries ensure that no space loss occurs[2].

Classification of space maintainers:

Table 12.1: Classification of space maintainers

According to Hitchcock

- Removable or fixed or semifixed
- With bands or without bands
- Functional or nonfunctional
- Active or passive
- Certain combinations of above

According to Raymond C Throw

- Removable
- Complete arch
- Lingual arch
- Extraoral anchorage
- Individual tooth

According to Hinrichsen

Fixed space maintainers

Class I

a. Nonfunctional types
   - Bar type
   - Loop type

b. Functional types
   - Pontic type
   - Lingual arch type

Class II

- Cantilever type
- Distal shoe
- Band and loop

Removable space maintainers

- Acrylic partial dentures

Band and Loop:

1. The appliance is used to maintain space of a lost single tooth.
2. The appliance is inexpensive and is easily fabricated.
3. With the use of this appliance a continuous care and supervision is required. However, it does not restore the occlusal function of the missing tooth.

Indications:

1. Unilateral loss of the primary first molar before or after eruption of the permanent first molar.
2. Bilateral loss of a primary molar before eruption of permanent incisors.

Fabrication of band and loop space maintainer:

Step 1:

(a) Select and fit a band on the abutment tooth. Band selection is on trial and error basis, bands are tried over the abutment tooth until one can be nearly seated on the tooth with finger pressure and to gain an appropriate final occlusal and gingival dimension. Utilization of band pusher and band biter is accomplished.

(b) A properly placed band is seated approximately 1 mm below the mesial and distal marginal ridges. If needed orthodontic separators can be used to gain or create space for the band material placement.

Step 2:
Next, make a quarter arch impression of band and edentulous area with alignate impression material with use of perforated tray so that impression material can flow in perforations and can prevent distortion of impression when it is removed.

Step 3:
Next, stabilize the band in impression in the correct position.

Step 4:
The impression is poured in stone with band in place; the cast is separated.

Step 5:
The wire is shaped into a loop and is well contoured to fit the band and alveolar ridge.

Figure 1:- Cut 2.5" of 0.36 wire.

Figure 2:- Try on cast for close fit.

Figure 3:- Prong pliers for contour.

Figure 4:- Prong for vertical contour.

How to Bend a Band Loop Spacer:
Requirements:

1. The loop should parallel the edentulous ridge 1 mm off the gingival tissue and must rest against the adjacent tooth at the contact point. Faciolingual dimension of loop should be approximately 8 mm.
2. The required dimensions must be included in fabrication to allow the permanent tooth to erupt freely but not impinge on the buccal mucosa or tongue.
3. The fabricated loop should not restrict any physiological tooth movement such as increase in intercanine width which occurs during eruption of permanent lateral incisors.

Step 6:
Adjustment: After fabrication of band and loop it should be fitted and adjusted accordingly.

Step 7:
Cementation: Band should be cemented onto dry, clean tooth with zinc phosphate or glass ionomer cement.

Step 8:
Patient recall visits: The patient is recalled every 6 months to check that appliance is working as per requirements as well as to check for fit of appliance and also that the cement has not washed out with also taking care of condition of abutment tooth.

Step 9:
Indication of removal: Eruption of permanent tooth is easily recognized indication of removal of space maintainer. Two modifications of band and loop appliance that are not recommended for use in space maintenance therapy[3].

Figure 5:- Vertical contour achieved.

Figure 6:- Space maintainer contact in the middle third of tooth mesial of the space.

Figure 7:- Check it for fit on the cast.

Figure 8:- Mark for "S" bends; contour is about 1 mm above tissue

Figure 9:- Contour buccal and lingual arms with 3 prong.

Figure 10:- 45 degree bend with birdbeak pliers.

Figure 11:- 45 degree "up" bend.

Figure 12:- Improved buccal contour.

Figure 13:- Wire at junction of occlusal and middle third of the band.

Figure 14:- Proper contour.

Figure 15:- Wire should now be contoured to the buccal and lingual contour of the tooth.

Figure 16:- Occlusal view.

Discussion:-

The premature loss of teeth is an unfortunate occurrence. Each situation needs to be assessed thoroughly to provide the best treatment. The knowledge of using the appropriate appliance at the right time is an important aspect of space maintenance treatment planning .This direct technique or Single sitting technique can be aptly said to be Space maintenance in its simplest form as it offers the following advantages[4].

1. Single sitting procedure the entire procedure can be completed in a single appointment.
2. No impression making as the impression making and cast preparation are avoided, there are no chances of error related to them such as band dislodgement on the cast.
3. Lesser chair side time this is again related to the avoidance of impression making, which may be difficult and time consuming in young children.
4. Lesser laboratory time the time required for the transferring and positioning of band on the impression made, the pouring of cast, the waiting period for its setting, and the removal and trimming of cast is saved. The selections of prefabricated loops which are made prior to the patient's appointments can further reduce the laboratory working time.
5. Better Accuracy the technique is accurate as markings are made intra orally, and repeatedly confirmed for their correct position, unlike the conventional technique which has errors related to impression making and band dislodgement on the cast.

6. Easy fabrication this method can be easily mastered, as it is less technique sensitive. We have utilized this technique in a many as 50 cases and found it to be successful without any technical errors. The average time taken for the entire procedure from band pinching to cementation of the space maintainer is approximately 20 minutes, which is acceptable by patients and also by dentists. The patient's acceptance was more as the procedure was single sitting without any impression making. This technique can be adopted by the dental practitioners as a routine chair side technique as it offers more advantages over the conventional technique[5].

Conclusion:-

Space maintainers have been used in Pediatric Dentistry for many years. The use of these appliances, however, in terms of indications, contraindications, design and construction has gained little attention from researchers. This paper highlights the construction of a new technique of fabrication of band and loop space maintainer. The advantages of this new direct technique or Single sitting technique over the conventional technique are discussed[6,7].

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