Abstract

This course is geared toward the general dentist who wants a better understanding in the concept of maintaining space in the primary and transitional dentition.

Educational Objectives

By the end of this course, you should be able to:

• Identify why space maintenance is needed (even in the absence of a prematurely lost primary tooth)
• Identify when to place what type of space maintainer
• Learn how to fabricate the individual appliances
• Increase productivity while decreasing overhead by fabricating appliances in house
Space maintenance by simplistic definition is maintaining space in the oral cavity for the proper eruption of the permanent teeth. While considered a “bread and butter” component of a pediatric practice, confusion often arises among general dentists about when to use what appliance and the protocol in treatment planning and appointment sequencing. One of the main causes for orthodontic treatment is posterior space loss due to early loss of primary molars without the implementation of a space maintainer. Two instances this article will discuss are early loss of a “d” (first primary molar) and early loss of an “e” (second primary molar).

**Early Loss of a “D” (First Primary Molar)**

When a primary first molar is lost, one needs to know if the six-year molar in that quadrant is erupted to decide if a space maintainer is needed. If the 6 is erupted in that quadrant, no space maintenance is needed (Fig. 1). If the 6 is not erupted, a band and loop (or similar one-armed bandit) is indicated. There are two options when placing band and loops: the pre-fabricated band and loop (made by Denovo) (Fig. 2) and the lab-fabricated band and loop, which can be easily fabricated in a dental office or sent to a lab for fabrication (Fig. 3).

**Early Loss of an “E” (Second Primary Molar)**

When a primary second molar is lost and the 5 (second primary molar) is not ready to erupt, space maintenance is indicated. Three scenarios are possible in this case, either the 6 (first permanent molar) is erupted, partially erupted or not erupted. If the 6 is erupted, a bilateral space maintainer is indicated (wire nance in the upper arch or lower lingual holding arch in the lower arch) (Fig. 4 and 5). If the 6 is partially erupted, a distal band and loop is indicated (Fig. 6).

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**Fig. 1:** Abscessed #L. Space maintainer not needed due to #19 being fully erupted.

**Fig. 2:** Extracted #L. Pre-fabricated Denovo band and loop placed due to #19 not being erupted. Placed right after the extraction with no second lab appointment or lab fabrication needed.

**Fig. 3:** #B lost prematurely. Lab-fabricated band and loop placed due to #3 not being erupted.

**Fig. 4:** Premature loss of #A and #I. Wire nance placed due to #4 not being ready to erupt.

**Fig. 5:** Premature loss of #K. Lower lingual holding arch (LLHA) placed.

**Fig. 6:** Pre-fabricated Denovo distal shoe band and tube with Denovo band and loop male end. The 6 year molar was not erupted enough to place a band when this appliance was placed. When erupted enough to place a band, a LLHA will be placed.
If the 6 is not yet erupted, a distal shoe is indicated (Fig. 7 and 8).

**Early Loss of a “D” Protocol**

New patient exam: five-year-old. #B is abscessed, #3 is unerupted and #A is caries free.

**Option #1**

Appointment 1: New patient exam, patient took BWs and is cooperative at GP’s office. In addition to usual new patient exam and prophy, take quadrant alginate impression.

Between appointments: Pour up model and fabricate band and loop with area cut out around the abutment tooth for the band to be seated on.

Appointment 2: Extract tooth #B, fit a band, take the band and seat on the model, secure the already fabricated band and loop on the model, solder, cement with glass ionomer cement.

**Option #2**

Appointment 1: New patient exam.

Appointment 2: Extract tooth #B, fit a Denovo band, size the male end/crimp (Figs. 9, 10, 11, 12), cement with glass ionomer cement.

**Early Loss of an “E” Protocol**

**Case #1**

Nine-year-old with #T abscessed, #30 erupted but #29 not ready to erupt.

Appointment 1: New patient exam. In addition to usual new patient exam and prophy, take lower arch impression. Place separator #K/#19.

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*Fig. 7: Distal shoe preventing the six-year molar from erupting into the “E space.” Notice at this appliance check that the blade is now longer than it needed to be so it was removed, trimmed and recemented. Frequent appliance checks needed and always take a pre-cementation periapical radiograph. Photo taken four months after appliance placed.*

*Fig. 8: Trimmed distal shoe. When the six-year molar is fully erupted, a wire nance should be placed. Photo taken 18 months after appliance placed.*

*Fig. 9: Pre-trimmed Denovo band and loop.*

*Fig. 10: 020-H (heavy wire cutter that will cut up to a 020 SS wire) to cut the male end. Notice the “nicks” from cutting .036 SS wire.*

*Fig. 11: Trimmed Denovo band and loop.*

*Fig. 12: Squeezing the female end to secure the connection after exact length is established.*

continued on page 100
between appointments: Pour up model and fabricate lower lingual holding arch, cut area out around the abutment teeth for the bands to be seated on (Figs. 13-16).

Appointment 2: Remove separator #K/#19 and fit band while waiting on anesthetic (assume same size band on #30), have assistant seat bands on model, secure the LLHA to the model at the anterior teeth with sticky wax then secure area just anterior to the solder joint with snap stone. Solder, finish and polish, cement with glass ionomer cement.

Case #2
Seven-year-old with #K abscessed, #19 is partially erupted and unable to band.
Appointment 1: New patient exam. In addition to usual new patient exam and prophy, take lower left quadrant impression. Place separator between #s L/M if not enough proximal space to fit a band.

Between appointments: Pour up model and fabricate distal band and loop (or distal one-armed bandit), cut out area around #L for the band to be seated on. My preference is to have a SSC of the appropriate size converted to a band by cutting the top out and polishing, crimp if needed.

Appointment 2: Remove separator and fit the modified crown or band, take that crown or band and seat on the model, solder the distal band and loop to the crown or band, finish and polish, cement.

Case #3
Five-year-old with #A non-restorable and #3 unerupted.
Appointment 1: New patient exam, treatment plan for extraction of #A and placement of a distal shoe.
Appointment 2: Extract #A, size the Denovo band, pick the appropriate narrow or wide male end with blade, trim the male end as needed (both the length of the blade and the length of the buccal and lingual extensions), seat and take a periapical radiograph verifying blade location - if in an ideal location, cement with glass ionomer cement.

The Case of Anterior Crowding (the Use of Leeway Space)
Leeway space is the difference between the combined mesiodistal widths of the deciduous cuspids and molars and their successors. When 3-4mm of crowding between the lower 1s and 2s in the transitional dentition, the use of a lower lingual holding arch has the potential to alleviate all of the crowding by holding the six-year molars from drifting mesially.
1. Space maintainers are only needed when a tooth is lost prematurely.
   a. True
   b. False

2. When a two-year molar (#A, J, K or T) is lost before the eruption of the six-year molar (#3, 14, 19, or 30), the appliance of choice is:
   a. Band and loop
   b. One armed bandit
   c. Nance or LLHA
   d. Distal shoe

3. Assume tooth #B is lost at age four due to non-restorable decay and tooth #A is present, the clinician should place:
   a. Band and loop
   b. Distal shoe
   c. Distal band and loop
   d. no space maintainer is needed

4. Assume tooth #B is lost at age eight and tooth #3 is in full Class I occlusion, the clinician should place:
   a. Band and loop
   b. Distal shoe
   c. Distal band and loop
   d. No space maintainer is needed

5. The pre-fabricated band and loops have one distinct advantage over the lab-fabricated band and loops which is:
   a. No second appointment is needed
   b. Bands adapt better to the tooth
   c. Follow the contour of the gingival better

6. When a conventional LLHA (assume premature loss of a second primary molar) can’t be used due to partial eruption of a six-year molar, the clinician should:
   a. Wait until the six-year molar is fully erupted then fabricate appliance
   b. Delay treatment until orthodontics can started
   c. Place a distal band and loop or non-conventional LLHA

7. Which appliance demands strict dietary restrictions, more frequent space maintainer checks and a pre-cementation periapical radiograph:
   a. Wire Nance
   b. Acrylic button Nance
   c. One-armed bandit
   d. Distal shoe

8. Posterior space loss from premature loss of a primary molar can usually be prevented with the use of space maintainers.
   a. True
   b. False

9. A pre-fabricated band and loop usually _________ have to be trimmed.
   a. Does
   b. Does Not

10. The difference between the combined mesiodistal widths of the deciduous cuspids and molars and their successors is known as:
    a. Leeway space
    b. Primary Molar space
    c. Maintainer space
    d. Primate space

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Fundamental Space Maintenance by Josh Wren, DMD

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3. COURSE OBJECTIVE #1 was adequately addressed and achieved
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5. COURSE OBJECTIVE #3 was adequately addressed and achieved
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7. COURSE OBJECTIVE #5 was adequately addressed and achieved
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8. Course material was up-to-date, well-organized, and presented in sufficient depth
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11. Audio-visual materials used were relevant and of high quality
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12. Handout materials enhanced course content
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13. Overall, I would rate this course:
    5 4 3 2 1

14. Overall, I would rate this instructor:
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For questions, contact Director of Continuing Education Howard Goldstein at hogo@dentaltown.com