

DENTAL TECHNIQUE

Measuring the space required for symmetrical prosthetic restorations in the esthetic zone for an orthodontic patient: A dental technique



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When multiple teeth are lost in an arch because of trauma, measuring the exact amount of space required to restore the missing teeth in a manner that is symmetrical and harmonious with the contralateral

teeth can be difficult. The width of the edentulous space may not be equal to the space required for the teeth on the contralateral side. This can be an especially difficult treatment challenge when the edentulous space occurs in the esthetic zone, as this distance must not only be measured but also be accurately and effectively communicated to the orthodontist for successful restoration. In addition, the method must be reproducible. One way to measure the space is to use bow dividers, calipers, or a Boley gauge,¹ but such measurements are not accurate because they use a linear measurement to determine length along a curve.

Ideally, the measurement should be compatible with the curved shape of the arch rather than adding a series of straight-line segments (tooth widths). Artola² described the use of a Boley gauge, calipers, or a ruler to measure an edentulous space for planning the number and size of pontics for an edentulous space, but this technique uses a table of average tooth sizes and would not necessarily yield a symmetrical result if used in the esthetic zone.

Musich and Ackerman³ described a method of measuring the arch perimeter with a catenometer. This technique uses a hanging gold chain held against a

ABSTRACT

This article describes a technique for measuring the length of the edentulous space to be restored and transferring the same size of the dentate space on the contralateral side to plan for symmetrical definitive restorations for the restorative dentist and orthodontist. The technique involves incorporating 2 archwire locks with hooks on a stainless steel wire that can be easily moved and adjusted to assess the curved space being measured. (*J Prosthet Dent* 2019;121:234-6)

dental cast to determine the perimeter of the dental arch; however, this approach is limited to a dental cast in the laboratory for measuring the entire arch. It cannot be used chairside because of the positioning of the arch required to make the measurement, and would not be useful for measuring arch segments. Other techniques describe a brass or stainless steel wire placed on the teeth in varying positions, including the facial surface and across the central groove approximating the interproximal contact areas to the lingual surface.⁴⁻⁷ This article describes a technique for measuring the length of the edentulous space to be restored both rapidly and precisely, and for transferring the same size of the dentate space on the contralateral side to plan for symmetrical definitive restorations.

TECHNIQUE

1. Using a commercially available preformed orthodontic archwire of 0.018-inch diameter (Natural Arch Form I; American Orthodontics) verify the compatibility of the patient's arch form with that of the archwire by aligning the wire on the cast. The

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Figure 1. Diagnostic cast with preformed 0.018-inch stainless steel orthodontic archwire. Archwire approximates facial surfaces of teeth.



Figure 2. Archwire with handle formed on 1 end and 2 archwire locks with hooks placed on wire.

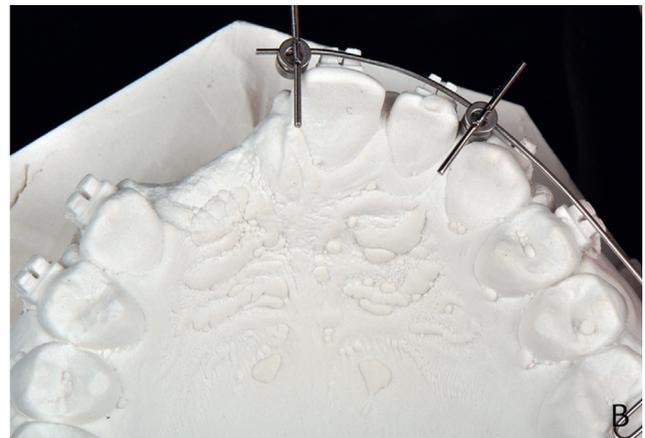


Figure 3. A, Archwire with locks superimposed on stone cast to assess edentulous space. Wire extensions attached to archwire stops placed at proximal contacts of teeth adjacent to edentulous space. Points of contact with wire extensions must be same on contralateral side. B, Measured space compared with contralateral side by flipping instrument 180 degrees. Identical position of wire extensions with respect to contact point should exist.

archwire should closely approximate the facial surface of the teeth, and a midline mark found on most preformed archwires should coincide with the dental midline. The archwire can be modified by the operator using arch-forming or bird beak pliers with basic wire-bending skills. Approximately 2 to 3 mm from the midline mark, section the wire so that the instrument can be flipped from side to side to evaluate symmetry (Fig. 1).

2. Modify the archwire using the bird beak pliers (Bird Beak Bending Plier [beaks ½-inch long]; Orthopli) to form a small handle so that the device can be accurately placed in the mouth or on a diagnostic cast. The other end of the wire should terminate at 2 mm past the midline if it can be identified, so that the archwire lock can be moved mesially or distally as needed to approximate it to the midline (Fig. 2).
3. Once the proper form and length has been established and the handle has been fabricated, 2 archwire locks with wire extensions (Rocky Mountain

Orthodontics) are placed on the wire. These can be moved mesially or distally to assess the curved space being measured. The archwire locks are attachments that slide over the archwire and can then be secured by an internal locking screw that is tightened with a hexagonal locking tool (Fig. 2).

4. Tighten the screw in the archwire locks using a hexagonal locking tool (Rocky Mountain Orthodontics).
5. Measure the pontic space directly with the instrument and then compare the dimension with the contralateral side by flipping the instrument 180 degrees (Fig. 3).

SUMMARY

The described technique provides a useful resource for evaluating the amount of space needed to restore the missing teeth in harmony with the contralateral side of the arch, even when the size of the edentulous space is

not the same as the dentate space. The pontic perimeter can be measured directly with the instrument and then compared with that of the contralateral side by flipping the instrument 180 degrees. Assessment can be made without the use of a millimeter scale. This straightforward device is easy to fabricate and use and may be more accurate than a linear measurement device when used properly.

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