

Egyptian Prosthodontic Association (EPA Newsletter) The Leaf Gauge: A Versatile Instrument for Dental Professionals



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What is the Leaf Gauge?

The Leaf Gauge was developed by Huffman since 1970 as a tool to aid dentists in achieving accurate bite registration in Centric Relation (CR) and occlusal analysis.¹ It is a set of flexible plastic leaves which contains 56 strips, every sheet is 0.1 mm. Its design has remained largely unchanged, reflecting its practicality and effectiveness in clinical practice. Today, it remains a widely used tool in clinical practice. (Figure 1)

How Many Leaves Are Needed To Start?

Enough to keep the back teeth apart, creating a smooth path, while ensuring the opening is still within the arc of closure (rotation). Too few leaves feels flimsy and can create a definite vertical component, especially with a deep overbite. Too many leaves feels bulky and could be too open, forcing the condyle down the eminence, beyond rotation (translation).

How Can Clinicians Use It?

Patient should be in supine position then putted between the two upper and lower centrals and ask him to move the mandible "Forward, back, lightly squeeze, half hard bite ." This bite make only the temporalis muscle to be active not the masseter to avoid protrusion of the mandible. ² (Figure 2)



Figure 1. Leaf Gauge



Figure 2. The mandible moves Forward, back, then lightly squeeze, half hard bite while the leaf Gauge inserted between anterior teeth. *Courtesy of Kwiecien K²*



What Is The Clinical Uses of Leaf Gauge?

1. Loading the TMJ (the Joint Loader Tool)

Load test could be defined as TMJ respond to firm upward pressure which was used to verify Centric Relation. Healthy TMJ will show negative sign of load test. However, if patient feels tension, tenderness, or discomfort, specifically in front of the ear or the surrounding area, the cause may be the joint or muscles.²

2. Deprogramming the lateral pterygoid (the muscle releasing tool)

This based on tripod concept. As separation between the teeth with less number of teeth in contact, will cause release the lateral pterygoid for a few minutes, delete muscle memory and allowing the muscles of mastication to assist the condyle into its physiologic position.²

3. Identifying first point of contact in centric relation (the Tooth I.D. Tool)

It can be used to predictably identify which tooth touch in centric relation with the aid of articulating paper. This will help to identify if there is a deflective contact which divert the mandible from a normal path of closure.³ (Figure 3)

4. Record the amount and direction of centric slide

By leaf gauge clinician can record the amount and direction of slide either in:

Vertical, Horizontal or Lateral slide. To measure the slides, move the leaf gauge laterally; measure all three positions using the same reference point for first tooth contact and MIP, examples:⁴

- Vertical – the free gingival margin of the same lower incisor to the incisal edge of the same upper incisor. (figure 4)
- Anterior/Posterior – the facial of the same lower incisor to the incisal edge of the same upper incisor. (figure 5)

- Horizontal – the difference in the midlines upper two centrals relative to lower two centrals. (figure 6)

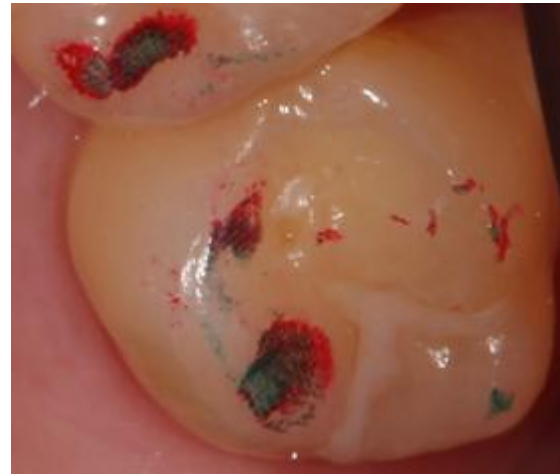


Figure 3. Marking the first tooth of contact (Retruded Contact Position) (RCP) with the aid of Leaf Gauge and articulating paper. *Courtesy of Spear Education³*

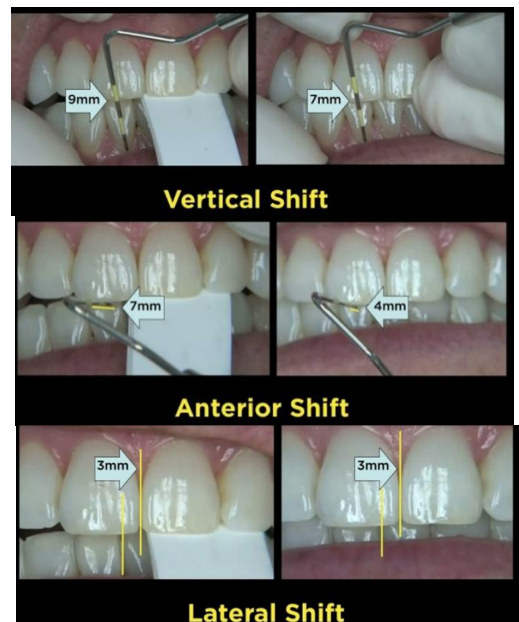


Figure 4,5,6. Recording the amount of centric slide using Leaf Gauge. *Courtesy of Spear Education⁴*



5. Obtaining centric relation bite records

It provides a simple and easy tool to take the bite registration in CR.⁵ (Figure 7)

1. Anticipate the needed increased amount in Vertical Dimension

Two sets of leaves can be used to measure the needed amount to be increased in VD.⁶ (Figure 8, 9).

How do the advantages compare to the disadvantages?

Leaf Gauge provides accurate bite registration and occlusal analysis. It can be used for a variety of dental procedures, ease of use for both dentists and patients and could be sterilized in autoclave.

However, it is difficult to be used in some patients with anterior mobile teeth, anterior crossbite or deep bite. Also, may cause distalization of the condyle posterior to CR if it is too rigid or protrude the mandible anterior to CR as some patient try to bite on the leaf gauge in slightly forward as bite off sandwich.⁷

With all of the advancement, why should clinician have to use leaf gauge?

The leaf gauge has long been an important tool in the prosthodontic field, advancing with other dental developments while remaining true to its basic function of ensuring optimal occlusion and prosthetic fit. Its continuous use emphasizes its importance in the careful planning and implementation of permanent prosthodontic procedures.



Figure 7. Bite registration in CR by Leaf Gauge method. Courtesy of *Kwiecien K*²

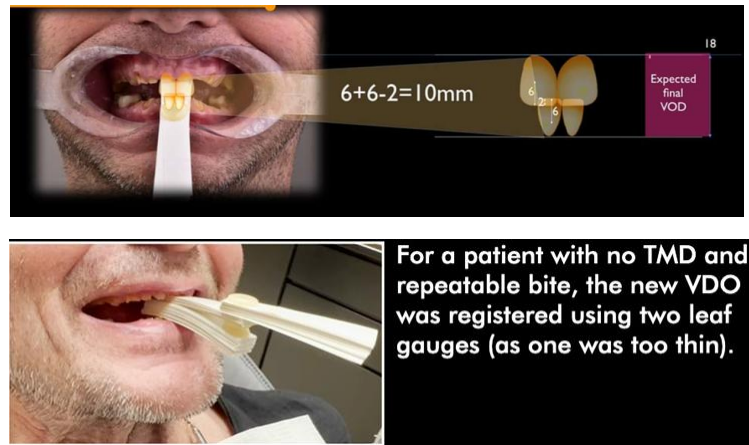


Figure 8,9. The expected final VOD measured by using two sets of Leaf Gauge. Courtesy of *Lassmann E*⁶



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