

TECHNICAL GUIDE



The Sagittal Appliance

Description:

The Sagittal appliance is a removable appliance comprised of expansion screws, clasp for retention and/or retraction, and acrylic. The upper Sagittal almost always has a posterior bite plane, the lower usually does not. It is an arch development appliance that can be used to accomplish various treatment goals. Often it is used as the first appliance in an overall comprehensive plan of orthodontic treatment where arch development is considered the first phase of treatment. The Sagittal was originally designed to develop the anterior-posterior dimension of the arch only, that is, to develop the sagittal plane of the arch. Later, a midline screw was added to the design by some practitioners to develop the lateral dimension of the arch as well. This variation of the appliance is referred to as a 3-Way Sagittal. The Sagittal appliance can be designed to either advance the anterior maxilla or to distalize the 6-year molars. The difference in design has to do with how the appliance is separated with slices and how it is clasped. Whether or not the second permanent molars are erupted or extracted also has a major influence on this function of the appliance.

The basic Sagittal appliance design incorporates two sagittal screws that are placed tangent to the mesial-lingual cusp tips of the 6-year molars. The appliance is sliced to the distal of the canines. If the second permanent molars have been extracted you can expect to achieve approximately 80% distalization and 20% anterior development. The numbers are reversed if the second permanent molars are present, that is, 20% distalization and 80% anterior development. Clasp varies on a case by case basis but usually is comprised of Adams, Delta or Sage clasps on the 6-year molars and one or two pairs of Ball, Arrowhead or Truitt clasps between the bicuspid/deciduous molars.

Blocked out canines, rotated or lingually displaced incisors, mesially positioned molars, and Division 2 incisors are examples of dental anomalies that can be adequately handled with design components easily incorporated into the Sagittal appliance. Design components such as the way the appliance is *sliced* (e.g., slice to the mesial of the molars instead of the distal of the canines), *clasped* (e.g., with the addition of cuspid retraction wires or labial bows), or *trimmed* (e.g., leaving deep indentations in the upper bite plane to increase anchorage and anterior push) all have an



effect on the way the appliance functions. Additional examples of design variations would be a Sagittal designed for TMJ, for Class III, or for Anterior Open Bite.

Indications:

- Can be used for Class I, II or III cases depending on how appliance is designed.
- Mixed or permanent dentition.
- Crowded arches and/or narrow palates.
- Blocked out canines.
- Deficient anterior maxilla.
- Mesially positioned molars.



Contraindications:

- Lack of enough teeth or lack of enough clinical height of crowns to achieve adequate retention from clasping.

Alternate Appliances:

- Fixed Sagittal (banded or bonded).
- CD Advancer or Distalizer.
- Fixed Removable Expander with Slip on Bands.

Advantages of this Appliance:

- It is removable so hygiene is excellent.
- It is extremely versatile, depending on design can be used for a wide variety of cases, anomalies, and malocclusions.

Clinical Procedures:

1. Complete maxillary and mandibular impressions. Check for accuracy, especially that the upper palate is clear. Inaccurate impressions are the major cause of poorly fitting appliances which only result in frustrated, non-compliant patients and unhappy parents.
2. Obtain a wax bite at normal biting relationship with approximately 3 mm thickness in the posterior area.
3. Pour impressions in lab stone.
4. Send the case to the laboratory with a completed *Orthodontic Technologies* prescription form. Be sure to indicate how you want the appliance to function and whether or not the second permanent molars will be extracted. Remember to offer your patients Wild Things®! They are beautiful and they encourage compliance. Also specify whether or not you want to add OT Appliance Insurance to the case.

Delivery Suggestions:

1. Trial fit the appliance. Make adjustments to the acrylic or wires if needed.
2. Give instructions to the patient on wearing and caring for their appliance. It is of paramount importance that the patient wears the appliance all the time, especially while eating! The appliance should only be removed for cleaning.
3. Also give instructions on the frequency and rate at which to turn the expansion screws. Demonstrate activating the screws and make sure the patient understands the procedure.

Normally all screws are activated one turn of the key, 2 x per week. The patient should be advised *not* to turn the key twice if a turn was missed the previous time.

4. Reschedule patient for 1 week to check the appliance and for compliance.
5. Reschedule thereafter every 4 to 6 weeks.

Length of Treatment Time and Results Expected:

Typically Sagittal treatment lasts anywhere from 2 to 4 months (not including the holding phase) depending on the amount of arch development needed and the rate at which the screws are activated. Sagittal screws (depending on the size of the arch) have an expansion range of 6 to 8 mm on the upper arch and 5 to 7 mm on the lower arch. If turned at a rate of 2 x per week (each turn being ¼ mm), a 5 mm screw would have reached its maximum expansion capability in 10 weeks, a 6 mm screw in 12 weeks, and likewise.

The results of Sagittal treatment should be measurable arch development (an increase in the anterior-posterior dimension, and lateral if with a midline screw) within the expansion range of the screws. Before beginning arch development it is advisable to complete a model analysis to predetermine the amount of expansion needed (your expansion goal) and to notate the patient's initial arch dimensions (to use as your point of reference). Some cases of extreme crowding may require two appliances to accomplish your treatment goals.

Hard and Soft Tissue Responses to the Appliance and Expansion Forces:

Hard tissue response will be excellent if the appliance is worn all of the time. If a situation arises where the appliance no longer 'fits' the patient's mouth, the most likely cause for this will be that the patient is not wearing the appliance while they eat and/or not all of the time. Another factor may be that the patient is not activating the screws properly, they may be turning the key more than once at a time.

Initially the appliance may cause some minor soft tissue irritation that will dissipate after a short time of continuous wear. Because the appliance is removed for cleaning, soft tissue irritation should not be an issue if the appliance is cleaned properly. The appliance should be cleaned with a toothbrush and paste and cold water only. An appliance cleaner such as Retainer Brite is recommended to keep the appliance free of tarter build up and to maintain the integrity of the wires. Do not use a denture cleaner as this will corrode the wires.

Holding Phase:

After the expansion phase is complete, the screws should be locked and the appliance worn for an additional 2 to 3 months for holding. The next phase of treatment can begin after this holding phase is complete.

Exception, if a second expansion appliance is going to be made then the old appliance should only be worn until the new appliance arrives. In this case please note two things. First, the new impression must be taken *without* the appliance in the mouth. Second, notate on the lab slip that this is a second expansion appliance. The laboratory will open the screws on the new appliance to allow some room for back-turning should some relapse occur between the time the impressions are taken and the time the new appliance is delivered.

For Additional Information Call **ORTHODONTIC TECHNOLOGIES, INC.** 1-800-346-5133

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