Fixed functional appliances (FFAs) have gained the popularity for growth modification in noncompliant patients, especially hybrid types. But for this, clinicians have to depend on certain commercially available appliances; otherwise components required in fabrication of hybrid type appliances are not routinely available in clinics, which discourage their use. Additionally, these preformed appliances have less scope in changing their length as per patient’s requirement of particular mandibular advancement. This article explains the chairside fabrication of hybrid type FFA named Sharma’s bite corrector appliance (SBCA). This custom-made and hygienic design provides stable fixation, less breakages with increased range of mandibular movement involving unrestricted mouth opening. SBCA permits quick chairside fabrication with ease in installation of appliance and is inexpensive.

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**INTRODUCTION**

Fixed functional appliances (FFAs) are popular for growth modification. Rigid, flexible and hybrid appliances have been introduced, including Herbst, Jasper Jumper, Eureka Spring, Forsus, Klapper super spring II, Twin Force Bite Corrector, Mandibular Protraction Appliance, etc. Non-compliant patients require the fixed functional approach.

Small and hygienic design, stable fixation, less breakages, wide range of mandibular movement with mouth opening made the hybrid FFAs popular. Forsus type superelastic spring-loaded appliances have gained popularity because of their ease in clinical application and expedient design. When considering chairside fabrication, many of the times routinely components are not available for the clinician in practice, which discourage its use. Compliance with use of preadjusted edgewise appliance is also essential, e.g. push rod in Forsus is easy going in placement and removal. For this, with an exception many times clinician has to be dependent on prefabricated design by manufacturers. Chairside quick fabrication of spring loaded FFA from usually available clinical wire components is described here.

**Appliance Construction**

Total length of the appliance is decided by measuring the distance from distal of maxillary headgear tube to the distal of the mandibular canine in desirable advanced mandibular position. Following things are necessary for the fabrication of the appliance:

- 1 mm thick-round TMA wire 10 cm in length (Fig. 1A), wire cutter and E4 Player (Fig. 1A)
- 0.8 mm (0.032") thick hard-round stainless steel wire
- Solder, flux and heat source, e.g. soldering torch.

1. **Maxillary tube assembly:** Take 10 cm long TMA wire and make a loop on one free end to approximate it through maxillary molar tube (headgear tube) (Fig. 1B). Give 90° bend from end of loop (Fig. 1C). Make a coil of 3 mm diameter, 8 mm from the bend in same direction (Fig. 1D). Again make another coil of 3 mm diameter, from the bend in opposite direction (Fig. 1E). Then prepare a small circular loop 10 mm in front of second coil in same direction for engaging distal to canine (Fig. 1F).

2. **‘Ball-end L-hook’**: It is prepared in 0.8 mm thick wire by putting a round drop of solder at one end; this is used to secure the maxillary end assembly in place with insertion of ‘Ball-end L-hook’ from distal of maxillary tube (Fig. 1G) and cinching mesially.

**Installation of Appliance**

Make sure that consolidated upper and lower arches have reached a stage of full slot engagement of stainless steel archwires in either 0.018" slot or 0.022" slot (Figs 2A to F).
Figs 1A to G: Steps in preparation of maxillary tube assembly
Transverse stabilization of upper molars should be done with transpalatal arch to avoid upper arch expansion, which happens due to the FFAs. Wires are secured with stainless steel ties rather than e-modules. Additional lower incisor labial root torque (e.g. MBT, Alexander prescription preferred) and cinch it behind the lower molar tube. Maxillary end assembly is secured by inserting Ball-end L-hook through maxillary molar tube (headgear tube). Wire coming mesially from opening of headgear tube is cinched upward, where free end tucked inside molar hooks. Molar bands with headgear tube positioned occlusally are preferred for installation of SBCA. Mandibular push component is inserted through anterior opening of a small circular loop distal to canine (for engaging fetching hook). Length of the mandibular push component should be kept such that, it should not poke out when the jaw is closed. Fetching hook engagement is carried out by either asking the patient to protrude the mandible or by compressing the mandibular push components. Once the fetching hook is engaged on both sides, asking the patient for gradual mouth opening, check the possibility of dislodgement of the push component from the wire. Mandibular advancement, patient comfort and midlines should be confirmed then final crimping is done with a Weingart plier. This completes the engagement and crimping of fetching hook inside the circular loop of the archwire distal to the mandibular canine. Same procedure is followed for the installation of appliance on the contra lateral side (Figs 3A to G). Then explain the postappliance placement instructions and prescribe a mouthwash. The patient recalls for every month check-up. After correction of overjet appliance was removed and settling of occlusion was done (Figs 4A to F).

**ADVANTAGES**

This customized design provides more scope for chairside alteration in the dimensions of the appliance as per patient requirement unlike the other commercially available devices. The results are similar to those of other commercially available designs used for Class II correction, with the following advantages:

- Appliance length can be changed chairside easily for increase or decrease in mandibular advancement and as per clinician’s requirement.
- Alterable in force levels (number of turns of coils doubled with in same length).
• Permits wide range of mandibular movement with unrestricted mouth opening.
• Quick, easy chairside fabrication and installation.
• Stable fixation.
• Increased flexibility in the appliance reduces breakages and extra appointments.

• It has versatility to be used with preadjusted edgewise appliances for Class II, III and subdivision correction.
• Small and hygienic design, easy to place and remove from mandibular archwire.
• SBCA is simple and inexpensive.

Figs 3A to G: Appliance installed for Class II correction of a patient. Lateral movements permitted and maximum limit of mouth opening of patient possible without dislodging of mandibular push component from maxillary tube assembly
REFERENCES


Figs 4A to F: Post-treatment photographs of the patient