A new technique for measuring mandibular guide flange angulation

When a mandibulectomy causes discontinuity, the patient will need a rehabilitative prosthesis to achieve proper occlusal relationship. In mandibular-based guidance prosthesis, the guide flange is attached to a mandibular removable partial denture (RPD) on the nonresected side and extended into the maxillary buccal fold, to guide the remaining segment of the mandible superiorly and laterally to the proper jaw relationship. The flange must achieve an angulation that is appropriate for the particular circumstances of each patient to minimize the complications with mandibular deviation.

After adjusting the occlusion, if indicated, make an accurate definitive impression of patient jaws.
Ask the patient to close his/her mouth toward the nonresected side (or guide the patient's mandible to proper intercuspation) and record the interocclusal relationship.
Mount definitive casts using the face bow and jaws' relation records and design the framework. Wax up the RPD against the mandibular cast. Involve most of teeth in the maxillary framework design to provide cross-arch stabilization.
Provide buccal clasps for the maxillary premolars and molars on the nondefected side to protect them against abrasion and excessive stress that are caused by contacting the mandibular flange. For accurate measurement of the maxillary buccal clasp thickness, wax up and casting of the maxillary framework should be completed before the mandibular flange wax up.
Mount the mandibular refractory cast against the maxillary cast and frame, using the jaw relation record.
Survey the mandibular cast and design the framework. Wax up the mandibular framework. The guiding flange will originate from the buccal continuous clasp on the mandibular premolars and molars on the nondefect side. The guide flange makes an angle with the mandibular framework (?) that is calculated using the following formula (Fig. 1).

$$\text{Tangent of } \alpha = \frac{\text{Maxillary buccal clasp thickness} + \text{posterior horizontal overlap}}{\text{Vertical distance of mandibular clasp to maxillary clasp in closed mouth position}}$$

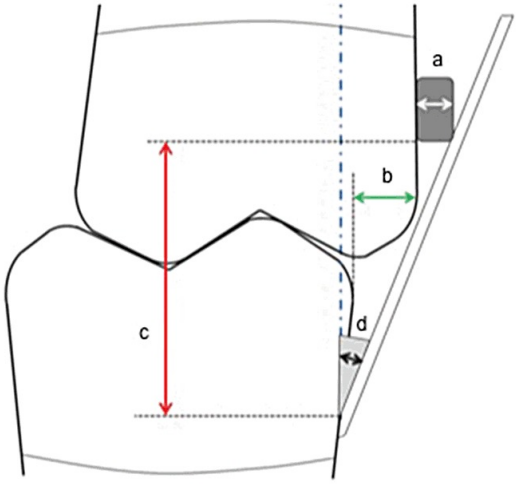

Fig. 1. Overall schematic illustration of mandibular guiding flange. The details are demonstrated with arrows. (a) Maxillary buccal clasp thickness, (b) posterior horizontal overlap, (c) vertical distance of the mandibular clasp to the maxillary clasp, and (d) angle of connection.

After calculating the angle of the guiding flange, the amount of correction for the horizontal deviation can be calculated according to the amount of the interocclusal distance in the first molar area.

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Wax up the mandibular guide flange using 14-gauge wax (1.63 mm) with the calculated angle, and connect it to the mandibular RPD wax up. Cast the RPD with selected alloy and prepare the framework using routine procedure.

Ask the patient to close her/his mouth toward the intact side while both frames are in the mouth. The guiding flange should be evaluated for smooth guidance of the mandible into appropriate occlusion.

Complete the RPD. Add the teeth (if indicated), evaluate, and process.

If the deviation of the mandible during jaw opening exceeds the amount that can be corrected by the flange at the determined angle, and correction of deviation without manual manipulation is desired, then the thickness of the mandibular buccal clasp to which the guide flange is attached should be increased. Additionally, an inclined surface should be formed on the buccal surface of the maxillary posterior teeth, to aid the flange in mandibular guidance and to achieve a proper occlusal relationship.

The guidelines described can be useful to preserve mandibular functions after resection and to minimize the complications with mandibular deviation.

Publication

Practical guidelines for fabricating mandibular guide flange prostheses: A new technique for measuring the flange angulation.
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