Removable prosthetics

Crossbite set-up with Typ posterior teeth

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Contents

Introduction

Edentulous patients may have different types of occlusion.
Often, due to skeletal conditions or atrophies, it is a crossbite.

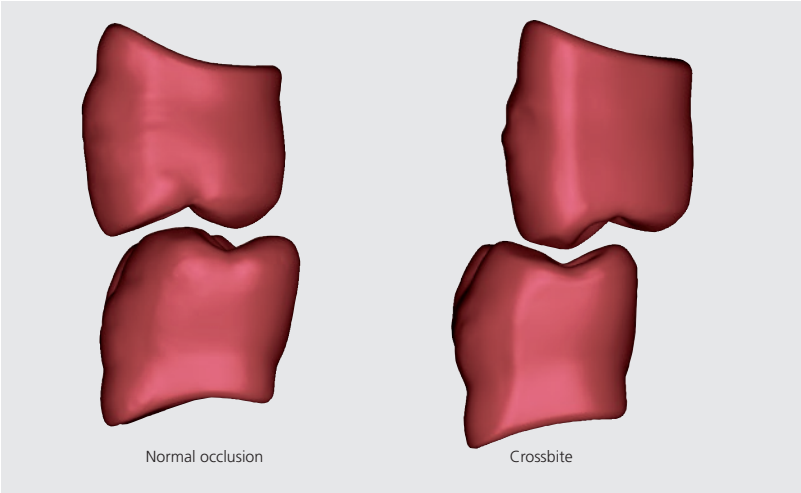
This guide shows how a crossbite can be identified in an edentulous jaw and how Typ teeth can be modified for an appropriate set-up.
This procedure applies to all Typ posterior teeth from Ivoclar Vivadent.

Definition of a crossbite

The orthodontist Dr Edward H. Angle (1855-1930) divided misalignments of the dentulous jaw into three classes. The assessment is based on the occlusal relation of the first molars in the maxilla and mandible. The buccal cusps assume the function of the working cusps.

- Class I: Neutrocclusion
- Class II: Distocclusion
- Class III: Mesiocclusion

The crossbite belongs to Angle class III (mesiocclusion). Rather than the palatal cusp, the buccal cusp of the upper molar occludes with the central fossa of the lower molar.



For the edentulous jaw, a further distinction is made within Angle class III:

1. One-sided crossbite due to atrophy of the maxilla and mandible
2. Crossbite on both sides with protrusion of the mandible (prognathism)

Models in the articulator – Crossbite analysis

The working models are aligned with each other in the usual manner using the wax bite or the intraoral registration, and then articulated. Subsequently, the model analysis of both jaws is carried out. The midline of the jaw is transferred to the model edge for the subsequent working steps.

Comprehensive model analysis

Marking:

Centre of the incisive papilla

Relevance:
- Anatomical midline of the upper jaw
- Labial positioning of the central incisors

Marking:

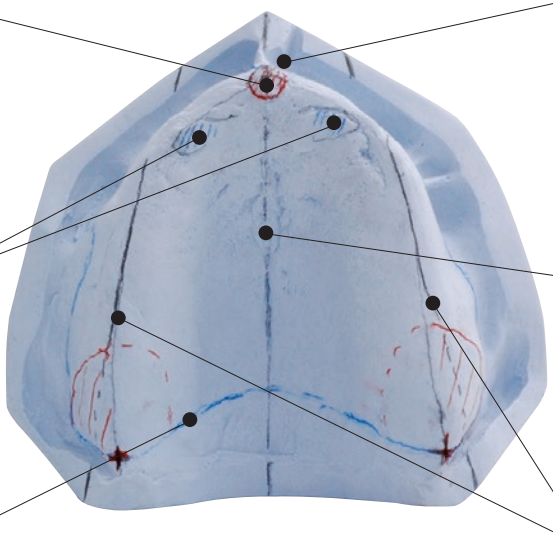
First large pair of rugae

Relevance:
Labial positioning of the canine teeth at the tip of the rugae

Marking:

Post dam

Relevance:
Posterior palatal limit of the denture base



Marking:

Deepest point of the vestibule

Relevance:
Starting point for measuring the vertical dimension and the incisal height of the central incisors

Marking:

Palatal suture (raphe palatina), anatomical midline

Relevance:
Reference point for the transversal symmetry of the anterior set-up

Marking:

Crest of the alveolar ridge

Relevance:
Provides orientation for a static set-up

Marking:

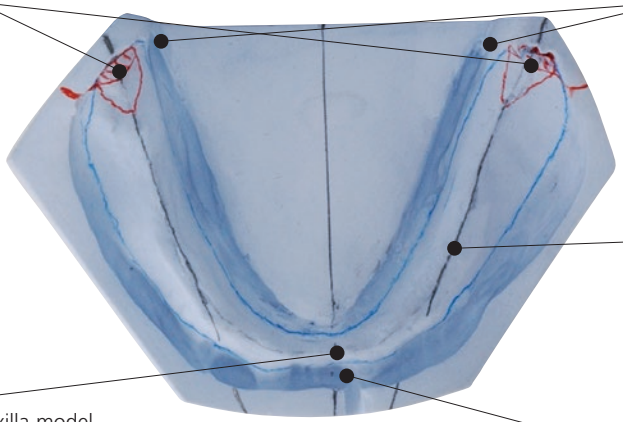
Distal half of the retromolar pad (trigonum retromolare)

Relevance:
- Positioning of the setting up template on the dorsal aspect (corresponds to the height of the occlusal plane)
- Dorsal positioning of the lateral wings of the horizontal guide

Marking:

Model midline transferred from maxilla model, anatomical midline

Relevance:
- Bilateral orientation for the anterior set-up
- Position of the symphysis fork of the horizontal guide



Marking:

Lingual limit of the retromolar pads

Relevance:
Pound's Line, consideration for tongue space

Marking:

Crest of the alveolar ridge

Relevance:
Course of the central fissure of the posterior teeth (static positioning)

Marking:

Deepest point of the vestibule

Relevance:
Starting point for measuring the total vertical dimension

If the upper dental arch is narrower than the lower arch by more than one premolar width, a crossbite set-up in the posterior area is indicated.
In the case shown, a crossbite situation is present on the left due to atrophy, while a normal bite is present on the right.

Modification of the molars

In the crossbite situation, the buccal cusps of the maxillary molars slide into the central fossa of the mandibular molars and assume the working function.

The buccal cusps of the **maxillary molars** therefore require modification. Carefully, grind the edges off with fine rubber polishers to create abrasion facets and then polish the surfaces to a high gloss again.

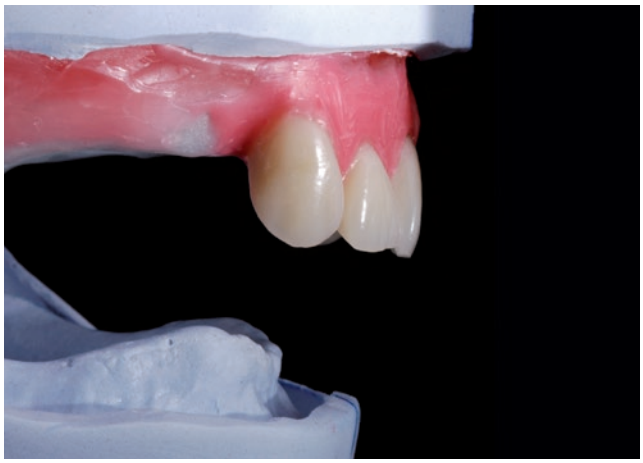
The maxillary molar should lie flush in the central fossa of the mandibular molar.

Important!
The reduced areas must be polished to a high gloss again, as the modification would otherwise affect the abrasion behaviour of the tooth.

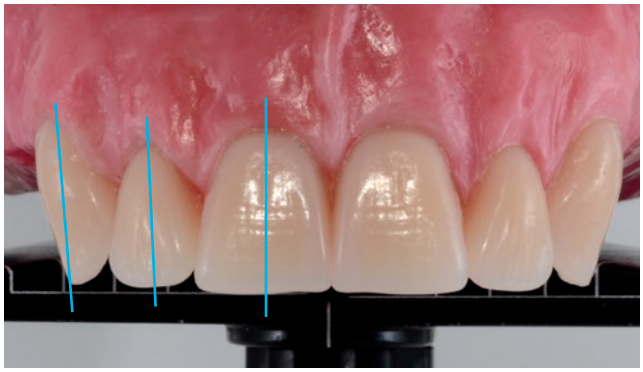
Set-up – Upper anterior teeth

The front teeth are set-up according to the model analysis or the information from the wax registration.

In general, the maxillary incisors are aligned with the curvature of the dental arch and point toward the lower mucolabial fold. Their labial curvature harmoniously blends in with the vertical anterior tooth arch.

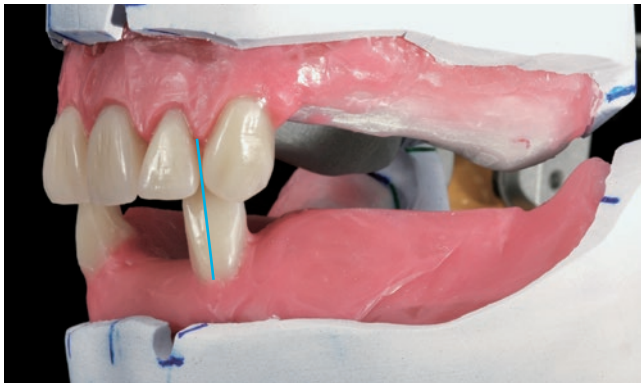


The central incisors are set-up perpendicular to the occlusal plane, the laterals are positioned with a slight mesial inclination and the canines are placed so that the long axis is almost vertical.



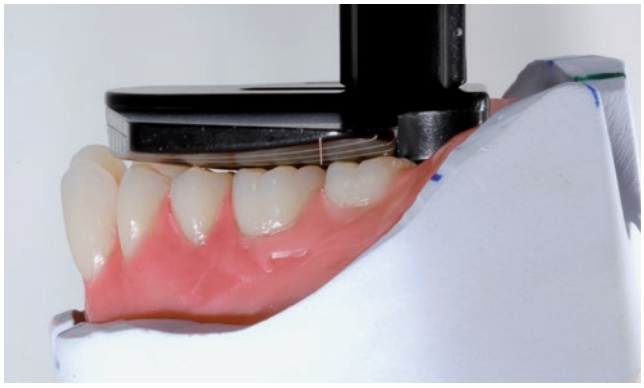
Set-up – Mandible

The lower canines are set up in relation to tooth 13 and 23. The direct axis of the lower canine points between the upper lateral incisor and the canine.

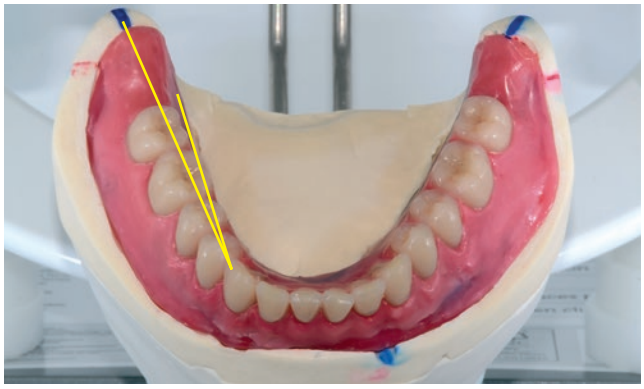


The first premolar should be placed in such a way that there is a smooth transition to the canine. This means that the distal slope of the incisal edge is flush with the mesial rise of the first premolar.
The template is adjusted to the cusp tips of the first mandibular premolar and the distal thirds of the retromolar pads.

The posterior teeth are placed with contact to the template on both sides.



They are oriented according to the centre of the alveolar ridge and Pound's line.

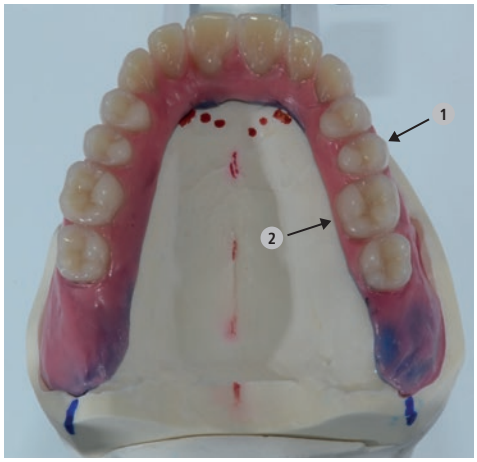


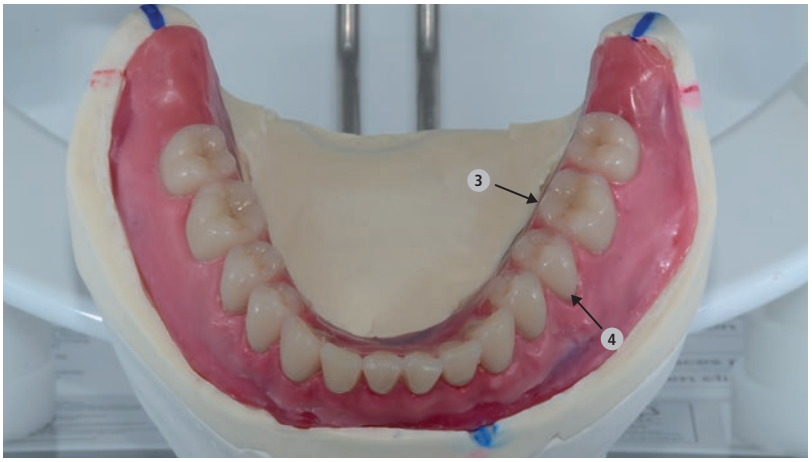
Set-up – Maxillary posterior teeth

The upper posterior teeth are set up as in a normal bite situation with a one-to-two-tooth relationship. In a crossbite there is a reversed cusp-fossa relationship starting from the molar. The upper buccal cusps are in contact with the lower central fossa.

* For an optimum transition into the crossbite, the second premolar should be placed in an edge-to-edge bite situation. In this case, it is important not to reduce the buccal cusp tip of the upper premolar too much since otherwise the guidance contacts are affected.

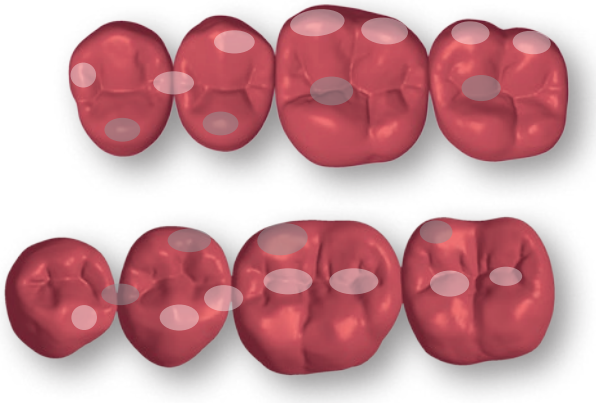
To avoid the typical crossbite curve, minor changes are necessary:





1. Move the upper second premolars slightly toward the palatal area
2. Move the upper first premolars slightly more to the buccal
3. Move the lower first molar slightly more to the buccal
4. Move the lower second premolar slightly more toward the lingual area

Finally, the contact points of the set-up are checked again.



In function – Comparison between a normal bite and crossbite set-up

Centric normal bite

The teeth are placed in a one-to-two-tooth relationship. Consequently, the primary contacts in the centric position are located in the central fossae of the mandible and on the marginal ridges.

Centric crossbite

Up to and including the second premolar, the occlusal relation is normal. From the first molar onwards, the teeth for the crossbite are situated in a statically correct, reverse relationship to the antagonist teeth.

Laterotrusion normal bite side

The mesio-buccal surfaces of the maxillary premolars slide over the distal-buccal edges of the mandibular premolars.

Laterotrusion crossbite side

The buccal cusps (working cusps) of the maxillary molars slide over the lingual surfaces of the mandibular molars.

Recommended literature

Removable Denture Prosthetics, Basics according to the BPS® Concept, Denture Manufacturing Protocol. Ivoclar Vivadent AG, Schaan (2014)

Removable Denture Prosthetics, Basics according to the BPS® Concept, Clinical Protocol. Ivoclar Vivadent AG, Schaan (2014)

Deep Overbite and Crossbite, Special Edition, Ivoclar Vivadent AG, Schaan (2006)

BPS Full Dentures, a Systematic Approach, Verlag Neuer Merkur GmbH, Munich (2003)

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