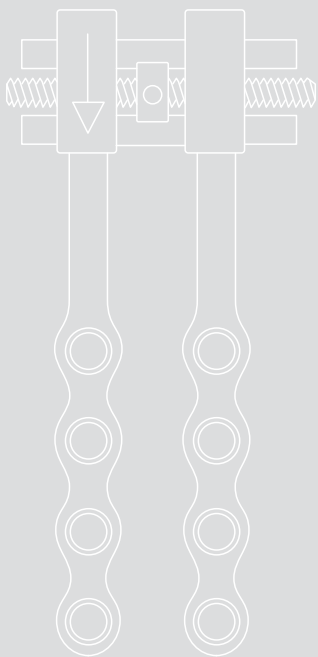




The Rotterdam Midline Distractor
(RMD)





Introduction

Transverse mandibular hypoplasia (TMH) with crowding of the anterior teeth and a V-shape of the mandible is frequently seen in patients with Class I and II malocclusions and Class III patients requiring decompensation before orthognathic surgery. Traditionally, teeth slicing and teeth extractions with compensating orthodontics, functional appliances or orthopaedic devices have been the first choice of treatment, but have resulted in instability, compromised periodontium and compromised facial aesthetics.

The surgical technique of widening the symphyseal area of the mandible is based upon gradual distraction following vertical interdental symphyseal osteotomy and has proven to be successful. However, the distraction devices used so far are rather bulky with great discomfort for the patients, including mucosal irritations, hyperplasia and pain.

A small, slim but very strong distractor has been developed, the Rotterdam Midline Distractor (RMD).

The Rotterdam Midline Distractor RMD



Rotterdam Midline Distractor

The Rotterdam Midline Distractor (RMD) is a totally bone-borne distractor and is very easily placed and activated. It has the design of a simple hyrax-appliance with two four-hole mini plates attached. Its flat design will guarantee a maximum patient comfort. As the distractor is totally bone-borne early orthodontic teeth alignment can take place. The activation unit is made of titanium alloy (Ti-6AL-4V) and the plates are made of titanium grade II. The distractor is very stiff and resistant which is a prerequisite for an ideal parallel widening. The activation mechanism remains completely extramucosal.

The Rotterdam Midline Distractor (RMD) is available in two sizes, 10 and 15 mm. Limited vertical height can be compensated by simply shortening the attached mini plates caudally.

Developed in cooperation with

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Advantages

- Easily placed and activated
- Parallel widening due to stiff and resistant device applying a very slim and comfortable distractor
- No mucosal irritation with discomfort and pain
- Allows simultaneous orthodontic treatment with fixed appliances
- Can be removed easily under local anaesthesia

Indications

- (Extreme) transverse mandibular hypoplasia in non-syndromal and syndromal patients
- Anterior dental crowding
- V-shape of the mandible

Relative contra-indication

- Class II/1 and II/2 deep bite; the deep bite may interfere with the position of the Midline Distractor. This can be overcome by placing the RMD more apically or by wearing an occlusal splint during the distraction and consolidation period.

Intraoperative procedure



Fig. 1: Incision



Fig. 2: Osteotomy line

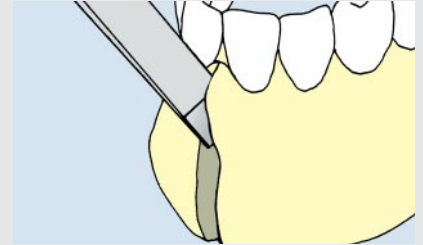


Fig. 3: Spreading the mandible to complete the osteotomy

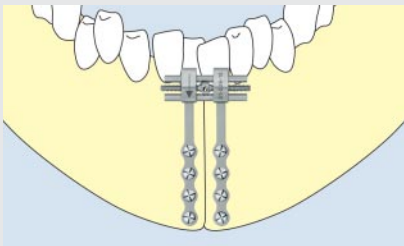


Fig. 4: Distractor device is fixed to the bony part of the mandible

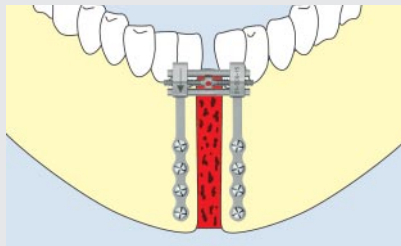


Fig. 5: Test of the distraction procedure intraoperatively

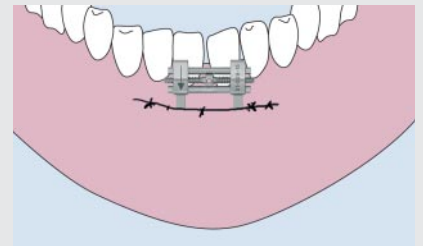


Fig. 6: Distraction procedure started, soft tissue is closed

Intraoperative procedure

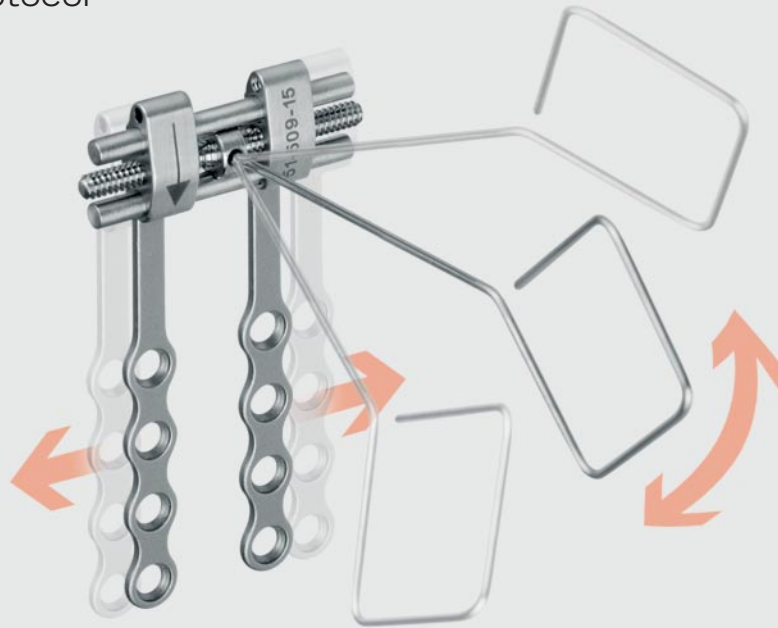
The operation is performed under general anaesthesia, preferably with naso-endotracheal intubation. Via standard incision in the labial vestibulum easy access is gained to the bony structures of the symphyseal area (Fig. 1). The line of the ideal interdental symphyseal osteotomy is marked and the lower part is already osteotomized (Fig. 2). The plates of the distractor are bent and adjusted to the form of the mandible. The RMD is fixed with six screws of which at least four are bicortical. A possible interference of the distractor with the upper incisors is checked. The distractor is removed and the osteotomy is completed (Fig. 3).

Now the distractor is refixed in a final manner (Fig. 4). The correct functionality of the distractor needs to be checked intraoperatively by activating the device 2-3 mm (Fig. 5). After checking the device is returned to the start position. The mucosa is primarily closed (Fig. 6).

Oral hygiene

The design of the Rotterdam Midline Distractor (RMD) is based on a hyrax-appliance and therefore food remnants are not likely to stick in the device. Patients must be instructed to routinely clean the device at least twice per day thoroughly. Visit of an oral hygienist is recommended on a regular base.

Distraction protocol



Latency phase

Once the Rotterdam Midline Distractor has been implanted, a latency period of approx. 5-7 days (depending on the patient) must be observed before starting the distraction process.

Distraction phase

Active distraction is performed with a patient activating wire (ref. no. 51-509-90-07, see page 7). The distractor features an arrow to indicate moving direction.

One complete movement with the activating wire (90°) equals 0.25 mm. The recommended distraction length per day is 0.5 mm (two movements) to 1.0 mm (four movements) based on the general patient considerations.

Consolidation phase

The consolidation phase lasts approx. 10-12 weeks. In order not to jeopardize the distraction result, the distractor must be left in situ until complete osseous consolidation has been achieved. Orthodontic treatment can already be started during this phase.

Removal of the distractor

At the end of the consolidation period the distractor can be removed in an outpatient clinic. The mucosa surrounding the distractor is infiltrated with local anaesthesia including a vasoconstrictor. A mucosal flap is raised and the screws including the distractor are removed. The mucosa is primarily closed. The healing of the mucosa is normally restored within one week.

Clinical examples

Case 1



Fig. 1: Pre-OP



Fig. 2: During distraction period



Fig. 3: Post-OP

Case 2



Fig. 1: Pre-OP



Fig. 2: Vertical osteotomy

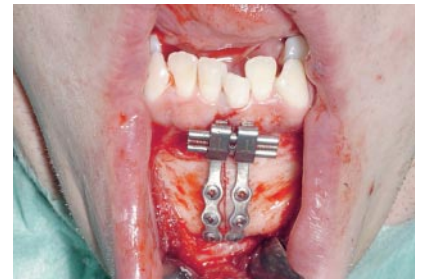


Fig. 3: Refixation of the distractor



Fig. 4: Test of the distraction procedure intraoperatively



Fig. 5: Start of distraction after latency period



Fig. 6: Post-OP

Ordering details and literature



Rotterdam Midline Distractor



Activating wire

Ordering details

Distractors

51-509-10-09	Rotterdam Midline Distractor, 10 mm (incl. activating wire)
51-509-15-09	Rotterdam Midline Distractor, 15 mm (incl. activating wire)

Recommended screws (Centre Drive® or maxDrive®)

Standard	2.0 x 4 mm to 2.0 x 11 mm
Emergency	2.3 x 5, 7, 9 mm
Drill-Free	2.0 x 5, 7 mm

Recommended instruments

25-407-04-04	Screwdriver handle, silicone, flat
25-540-98-07	Centre Drive® screwdriver blade 2.0 mm
25-486-97-07	maxDrive® screwdriver blade 2.0 mm
25-449-05-91	Twist drill 1.5 x 50 mm, 5 mm stop
25-449-07-91	Twist drill 1.5 x 50 mm, 7 mm stop
25-449-09-91	Twist drill 1.5 x 50 mm, 9 mm stop
25-449-11-91	Twist drill 1.5 x 50 mm, 11 mm stop
25-516-13-07	Modelling plier (2 recommended)
25-441-18-07	Plate holding forceps
25-435-20-07	Lindorf plate holding instrument
51-509-90-07	Activating wire (optional)

Storage

55-962-08-04	Distraction module, purple, w/o lid and inserts
55-963-17-04	Lid for distraction module
55-962-18-04	Storage module, purple, w/o lid and inserts
55-963-09-04	Lid for storage module
55-964-17-04	Insert universal
55-964-24-04	Insert empty, 2 sections

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