Bone-borne distractor

for transverse maxillary hypoplasia
Rapid Palatal Expander

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Rapid Palatal Expander (RPE)

Transverse maxillary hypoplasia in adolescents and adults is frequently seen in non-syndromal and syndromal patients including cleft palate patients. The hypoplasia may lead to arch length discrepancy and crowding, buccal corridors and posterior cross-bites. Uni- and bilateral transverse hypoplasia can be corrected by means of a surgically assisted rapid palatal expansion (SARPE). The treatment is a cooperation of orthodontic and surgical procedures and provides dental arch space for lining up the maxillary teeth.

The procedure also causes a substantial enlargement of the maxillary apical base and of the palatal vault and may therefore provide space for the tongue for improved swallowing and thus preventing relapse. In addition, a distinct subjective improvement in nasal airway associated with enlargement of the nasal valve towards normal values is seen with an increase of nasal volume in all compartments. It improves arch length and may reduce the need for premolar extraction as a measure to align the teeth. Widening the maxilla might reduce the unaesthetic buccal corridors, as seen in smiling.

Traditionally, transverse maxillary hypoplasia in adults is corrected with corticotomies and tooth-borne expanders. Tooth-borne distractors have some disadvantages as dental movements occur: periodontal problems, buccal root resorption, cortical fenestration, segmental tipping and tipping of the anchorage teeth.

In contrast, bone-borne distractors are positioned at a higher level in the palatal vault, consequently maxillary expansion is predominantly skeletal and forces are directed at the desired level. In addition, the forces are on the bone and no tooth tipping, fenestration, etc. are to be expected.

The KLS Martin Rapid Palatal Expander is an elegantly designed bone-borne distractor which is very versatile in both placement and activation.

Advantages
- Bone-borne distractor
- Forces are directly applied to the bone
- No tooth tipping and extrusion
- No orthodontic relapse expected after the expansion
- Shortened treatment time due to the opportunity for early orthodontic teeth alignment
- No periodontal ligament compression, buccal root resorption, and fenestration are to be expected
- Easily placed and activated
- Easy removal
- Available as a sterile product

Indications
- Transverse uni- or bilateral maxillary hypoplasia in syndromal and non-syndromal patients
- Anterior dental crowdings and buccal corridors

Contraindications
- General or local health issues as immune deficiency, titanium allergy, irradiated maxilla, palatal defects
- Psycho-social inability to comply, suspected lack of patients collaboration
- Shallow palatal vault, might result in loosening
Schematic procedure step by step

1. Intraoperative approach
Osteotomies of the lateral, anterior and median bony supports of the maxilla. In case of posterior (parallel) expansion pterygomaxillary disjunction (posterior release) might additionally be performed. Release of nasal septum is discussed controversially among physicians.

* Clinical photos by courtesy of Dr. Hamid-Reza Sarajian, Rotes Kreuz Krankenhaus, Kassel, Germany
2. **First placement**
The KLS Martin Rapid Palatal Expander (RPE) is positioned with the abutment plates on the mucosa over the roots of the second premolar (in case of anterior (3:2) expansion, Fig. 1) and first molars (in case of posterior expansion, Fig. 2). The activation rod is in the midline and must not interfere with the lower teeth in occlusion.

3. **First activation***
The distractor is slightly activated. Thus the print of the plates is clearly visible on the mucosa. Now the palatal mucosa on the anterior and occlusal side directly around the abutment plates is incised. The distractor is deactivated and removed.

4. **Final placement**
The area of palatal mucosa removed is slightly smaller than the abutment. Local haemostasis is performed. The RPE Distractor is placed again with the plates now on the bone. The distractor is slightly activated so the spikes penetrate the bone stabilizing the distractor. Make sure that the distractor is adequately placed with osteosynthesis holes of the abutment plates placed towards anterior.

5. **Fixation of the distractor**
Finally, the distractor is secured with the two additionally supplied drill-free screws in the holes of the distractor plates.

* Clinical photos by courtesy of Dr. Hamid-Reza Sarajian, Rotes Kreuz Krankenhaus, Kassel, Germany
6. **Tighten the locking nut**
To avoid undesired movements of the distractor body during latency period, it is necessary to tighten the locking nut with the rigid working end of the patient activating wrench (item no. 51-565-95-07).

7. **Latency period**
Activation can begin 5 – 7 days after device placement based on the surgeon’s treatment plan.

8. **Distraction period**
The distractor is easily activated with the patient activating wrench (item no. 51-565-90-07 or item no. 51-565-95-07). A rotation through 120° to the next color coding corresponds to a distraction travel of 0.33 mm. A rotation through 120 (– 240°) per day is recommended which corresponds to a distraction travel of 0.33 (– 0.66) mm per day**. The exact activation can easily be observed thanks to the differently colored dots on the module.
9. Consolidation period*
A 3 – 4 months consolidation period is recommended. Orthodontic tooth movements can already be performed early in the consolidation period.

-Treatment protocol **:

- General anaesthesia, antibiotic prophylaxis.
- Corticotomies at lateral wall of the maxillary sinus and median alveolus and bony palate, simultaneous placements of fitted RPE (maximal size given by anatomy).
- Start oral hygiene protocol, with antiseptic mouth rinse, prolonged antibiotics if indicated.
- Latency period: 5 – 7 days, start distraction and patient instruction.
- Daily distraction 0.33 mm until desired width, use closure wheel.
- Consolidation period: 4 months.
- Removal of distractor under local anaesthesia.

* Clinical photos by courtesy of Dr. Hamid-Reza Sarajian, Rotes Kreuz Krankenhaus, Kassel, Germany

** The distraction varies according to surgeons’ wishes, orthodontic protocols or patients’ needs. The protocol can be altered during the period of active distraction.
Ordering details

* Distractor including activating wrench 51-565-90-07 and 2 maxDrive® Drill-Free screws 2.0 x 7 mm
** Sterile packed distractor, including activation wrench 51-565-90-07 and 2 maxDrive® Drill-Free screws 2.0 x 7 mm
Rapid Palatal Expander (RPE)

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<th>Distractors</th>
<th>Item Number</th>
<th>STERILE PA</th>
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<tr>
<td>9 mm distraction length</td>
<td>51-565-09-09*</td>
<td>51-565-09-71 **</td>
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<td>18 mm distraction length</td>
<td>51-565-18-09*</td>
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<td>27 mm distraction length</td>
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</tr>
<tr>
<td>36 mm distraction length</td>
<td>51-565-36-09*</td>
<td>51-565-36-71 **</td>
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</tbody>
</table>

Recommended distraction length
1-2 color codes = 0.33-0.66 mm/day (one complete turn = 1.0 mm)

<table>
<thead>
<tr>
<th>Measuring Templates</th>
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<tr>
<td>Size I</td>
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<td>Size IV</td>
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</tbody>
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Recommended screws
maxDrive® Drill-Free: 2.0 x 7 mm

Patient screwdriver
Activating wrench | 51-565-90-07 |
Flexible activating wrench | 51-565-95-07 |

Screwdrivers and Blades for 2.0/2.3 mm maxDrive® screws
Screwdriver | 25-407-03-04 |
Screwdriver flattened, for storage in Level One modules | 25-407-04-04 |
Blade for KLS Martin angled screwdriver | 50-917-20-07 |

* Distractor including activating wrench 51-565-90-07 and 2 maxDrive® Drill-Free screws 2.0 x 7 mm
** Sterile packed distractor, including activation wrench 51-565-90-07 and 2 maxDrive® Drill-Free screws 2.0 x 7 mm
References

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KLS Martin is a pioneering company in distraction osteogenesis and has established in many individual indications its own specific product portfolio.

Besides these specific disciplines the KLS Martin product range also includes the complete spectrum of systems for traumatology, orthognathic surgery and reconstruction in today’s oral maxillofacial surgery. The folder system “CMF Osteosynthesis” is the standard work to all osteosynthesis products.

You should also get to know SonicWeld Rx®: It is worldwide patented the only resorbable osteosynthesis program, which is entirely based on ultrasound technology to weld in resorbable pins.

Resorbable osteosynthesis can just be so easy!

Of course you can also get in touch with us personally – via e-mail: info@klsmartin.com or via our customer hotline: +49/7461-706-0