Osteogenesis

Distraction

The Groningen Vertical Distraction System
The Art of Distraction Osteogenesis
Combining Science and Technology

Developed in cooperation with

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The Groningen Vertical Distraction System

An intra-osseous distraction device for the vertical distraction of the atrophic mandible.

- The distraction screws allow a vertical distraction of up to 8, 10, 12 or 14 mm.
- The moving part of the device (= fixation plate) has a threaded screw hole to accommodate the distraction screw.
- The fixation plate is fixed with 1.5 mm Centre Drive® Microscrews, recommended length 4 or 5 mm.
- One or more positioning screws are used to guide the segment to be distracted, ranging from 15 - 21 mm.
- Two full turns of the distraction screw results in 1 mm vertical distraction.
- Manufactured in titanium of implant quality.

Indications

- Patients with local, vertical defects of the alveolar ridge of both maxilla and mandible.
- Patients with severely resorbed edentulous mandible (bone height in the symphysis region between 5-10 mm) in whom it is indicated to insert endosseous implants for prosthodontic rehabilitation.

Contraindications

- General medical problems, including immunodeficiency, status after radiotherapy in the region (> 60 Gy) to be distracted, severe and non-regulated diabetes mellitus.
- Bone height and width of the residual mandible and maxilla less than 5 mm.
**Distraction Osteogenesis**
The Groningen Vertical Distraction System

**Intraoperative approach: Edentulous mandible**

The mandibular ridge between the mental foramina is exposed by an interforaminal incision in the buccal fold and raising of a mucoperiosteal flap. The mental foramina area is carefully identified.

A hole is made in the midline, on top of the alveolar ridge, using a twist drill of 1.1 mm diameter.

The drill is placed in the hole as a direction indicator.

Subsequently a hole (diameter 2 mm and depth 4 mm) is prepared at about one centimeter to the left and right side of the hole in the midline. Care must be taken not to perforate the basal cortical bone.

The holes are widened using a 2.5 mm twist drill. The surgeon has to check carefully that all sides are parallel with one another. On each side vertical cuts are made in the upper third of the mandibular bone anterior of the mental foramina; the minimum distance between cut and mental foramen is 5 mm. These cuts are horizontally connected. The use of an oscillating saw is recommended.

After all cuts have been made, the mobility of the anterior segment is tested.

In the midline the positioning screw is inserted after a small incision in the mucosa. The mobility of the anterior segment is checked again.

Subsequently the two distraction screws are inserted after incision of the mucosa. The distraction screws are fixed with a fixation plate using 1.5 mm Centre Drive® Microscrews, recommended length 4 or 5 mm.

The mobility of the anterior segment is controlled by raising the device to its maximum. Care is taken to preserve the soft tissue pedicle on the lingual surface.

The wound is closed in layers.

The patient is not allowed to wear a lower denture.

After five days the distraction can be started (one millimeter per day)

Two months after the last day of distraction the device is removed and two implants are inserted in the same holes. The holes are widened to the required dimensions with the standard burs for the implant system used. Thereafter the positioning screw is removed.

Twelve weeks after implantation prosthodontic treatment is started.

**Advantages**

- Good acceptance by the patient
- Miniaturized device
- No bone harvesting required
- No visible scars (extra-orally)
- Endosseous implants placed in the same holes as used for the distraction screws (after 2 months)
- Precise distraction vector
- No second operation needed to remove the distraction device
- Transport of vital alveolar bone with safe blood supply
**Distraction Osteogenesis**
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### Distraction Screws

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Length</th>
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<tbody>
<tr>
<td>51-535-08</td>
<td>Distraction length</td>
<td>8 mm</td>
<td>2 each</td>
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<tr>
<td>51-535-10</td>
<td>Distraction length</td>
<td>10 mm</td>
<td>2 each</td>
</tr>
<tr>
<td>51-535-12</td>
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<tr>
<td>51-535-14</td>
<td>Distraction length</td>
<td>14 mm</td>
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### Threaded Fixationplate

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### Positioning Screws

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<td>51-535-25</td>
<td>15 x 1.5 mm</td>
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<tr>
<td>51-535-27</td>
<td>17 x 1.5 mm</td>
<td>2 each</td>
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<tr>
<td>51-535-29</td>
<td>19 x 1.5 mm</td>
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<tr>
<td>51-535-31</td>
<td>21 x 1.5 mm</td>
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### Centre Drive® Micro Osteosyntheses Screws

<table>
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<td>25-074-04</td>
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<tr>
<td>25-076-05</td>
<td>1.8 x 5 mm</td>
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= Titan · Titanium · Titanio

Werkstoff Titan in Implantat-Qualität
Implant Material: Titanium Implant Quality
Materiale: Titanio per implant
**Distraction Osteogenesis**

**The Groningen Vertical Distraction System**

- **Centre-Drive® Screwdriver**
  - 25-430-16
  - 16 cm/6½"
  - 1/2

- **Patient Screwdriver hexagonal**
  - 51-535-90
  - 51-535-95

- **Holding forceps**
  - 12-404-12

- **Drills, dental attachment**
  - 31-535-51
    - 1.1 x 19 x 6 mm
    - with 5 mm stop
    - 1 each
  - 31-535-55
    - 2.0 x 30 x 17 mm
    - with scala 2,4,6 mm
    - 1 each
  - 31-535-60
    - 2.5 x 30 x 17 mm
    - with scala 2,4,6 mm
    - 1 each
  - 31-535-61
    - 1.1 x 30 x 17 mm
    - 1 each
  - 31-535-66
    - 1.6 x 45 mm

- **Rosen drill**
Set Recommendation:

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<th>Item Description</th>
<th>Length</th>
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<tbody>
<tr>
<td>Distraction Screws, distraction length</td>
<td>8 mm</td>
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<td>1 pck (2 ea.)</td>
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<td>Patientscrewdriver</td>
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<td>Drills, dental attachment</td>
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<td>Holding Forceps</td>
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Literature:


