**Sternum Pin**

- Fabricated side groove
- Center line
- Pediatric Sternum Pins

1. Hang several wires to both sides of the cut sternum. Make holes in both sides of the cut sternum by scratching the marrow with the specific reamer. If you need, use the specific reamer to extend larger. (The holes should be made smaller than GRAND FIX™)

2. Decide the product size by measurement. Insert GRAND FIX™ into the holes of sternum, holding the center of GRAND FIX™ with a specific clamp.

3. Draw and stick both the sides of sternum, and tie with the wires.

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**GRAND FIX™** is bioabsorbable bone fixation devices composed of poly-L-lactide (PLLA). GRAND FIX™ is gradually degraded upon hydrolysis and absorbed in the human body.

Gaining the interest in fixation by GRAND FIX™ in various placing methods, it enables to prevent joint motion of the divided sternum or ribs from separating. GRAND FIX™ can be made more robust chest clamping and contribute to reduce pain based on its effective to prevent both motions from rubbing.

In thoracostomy in children, GRAND FIX™ is described as effective to resist thoracic deformity.

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**Contact**

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Characteristics

GRAND FIX™ is bioabsorbable bone fixation devices consist of poly-L-lactic acid (PLLA). GRAND FIX™ is gradually degraded upon hydrolysis and absorbed in the human body.

Enhancing the internal fixation by GRAND FIX™ to your chest closing method, it enables to prevent joint surface of the divided sternums or ribs from separating.

GRAND FIX™ is able to make more robust chest closure and contributes to reduce pain based on its effectiveness to prevent bone sections from rubbing.

In thoracotomy in children, GRAND FIX™ is described as effective to resist thoracic deformity.

Bioabsorbability

<table>
<thead>
<tr>
<th>Bioabsorbability</th>
<th>Strength</th>
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<tr>
<td>Bending Strength Retention</td>
<td>Bending Strength</td>
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GRAND FIX™ is gradually degraded upon hydrolysis in the human body. Resorption for GRAND FIX™ is not necessary because of its absorption after healing of the joint portion.

![Graph showing degradation over time](image)

Instruction

1. Osteotomy
   - Fixation of ribs and sternum after thoracotomy
2. Osteosynthesis
   - Fixation of ribs and sternum after traumatic fracture
3. Bone transplantation

Usage

**Rib Pin**

- Made of Poly-L-lactic Acid (PLLA)
- Fabricated side groove
- Center line

![Illustration of rib pin](image)

Instruction:

1. Tie the rib with a suture about 2cm left from the end of rib. Make holes in the end of rib as deep as 1/3 of the length of GRAND FIX™ by scratching the marrow with the specific sizer. (The hole should be smaller than GRAND FIX™) Decide the product size correctly by measurement using the special sizer.

2. Insert GRAND FIX™ into the holes of ribs, holding the center of GRAND FIX™ with specific clamp. (Green marker should be positioned central)

3. Stick both ends of ribs, draw the sutures and ligate each other. In case that it is hard to stick both ends, use a wire and so on together to support.

Degradation of PLLA pin in buffer solution

![Degradation stages](image)
**Characteristics**

GRAND FIX™ is bioabsorbable bone fixation devices consist of poly-L-lactic acid (PLLA). GRAND FIX™ is gradually degraded upon hydrolysis and absorbed in the human body.

Enhancing the internal fixation by GRAND FIX™ to your chest closing method, it enables to prevent joint surface of the divided sternums or ribs from separating. GRAND FIX™ is able to make more robust chest closure and contributes to reduce pain based on its effectiveness to prevent bone sections from rubbing.

In thoracotomy in children, GRAND FIX™ is described as effective to resist thoracic deformity.

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**Bioabsorbability**

**Bioabsorbability**

Bending Strength Retention

GRAND FIX™ is gradually degraded upon hydrolysis in the human body. Resorption for GRAND FIX™ is not necessary because of its absorption after healing of the joint portion.

**Strength**

Bending Strength

Bending strength comparable to or higher than that of living bones (cortical bones) at the initial stage of implantation.

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**Instruction**

1. **Osteotomy**
   - Fixation of ribs and sternum after thoracotomy

2. **Osteosynthesis**
   - Fixation of ribs and sternum after traumatic fracture

3. **Bone transplantation**

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**Usage**

**Rib Pin**

- Made of Poly-L-lactic Acid (PLLA)
- Fabricated side groove
- Center line

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**Degradation of PLLA pin in buffer solution**

- After 2 months
- After 10 months
- After 21 months
- After 30 months

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1. Tie the rib with a suture about 2cm left from the end of rib. Make holes in the end of rib as deep as 1/3 of the length of GRAND FIX™ by scratching the marrow with the specific sizer. (The hole should be smaller than GRAND FIX™.) Decide the product size correctly by measurement using the special sizer.

2. Insert GRAND FIX™ into the holes of ribs, holding the center of GRAND FIX™ with specific clamp. (Green marker should be positioned central.)

3. Stick both ends of ribs, draw the sutures and ligate each other. In case that it is hard to stick both ends, use a wire and so on together to support.
**Sternum Pin**

Fabricated side groove

Pediatric Sternum Pins

Center line

**For Rib and Sternum Fixation**

GRAND FIX™ is bioabsorbable bone fixation devices containing poly-L-lactic acid (PLLA). GRAND FIX™ is designed to degrade gradually by hydrolysis and be absorbed in the body progressively.

Following the incision, the sternum is fully exposed. The ribs are then cut with the bone cutting forceps. After drilling the holes with the U-shaped bone drill, insert the GRAND FIX™ into each hole, and tie the wires. The wires are then cut to the desired length. The bone is then fixed, and the chest is closed with sutures. After surgery, GRAND FIX™ is designed to make well healing the sternum, and contribute to pain relief. GRAND FIX™ is described as effective to resist thoracic deformity.

**Contact**

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