Twin Hook Locking Plate

The Hansson Twin Hook is a well proven concept for the treatment of trochanteric hip fractures. Its development is based on the long and successful experience with the Hansson Pin System®. The new Twin Hook Locking Plate in combination with the Hansson Twin Hook offers strong, stable fixation with minimal surgical trauma. The Twin Hook Locking Plate is made from stainless steel 316 LVM and available sterile packaged for immediate use.

**A 28 mm unicortical Self-drilling/self-tapping Cortical Bone Screw (Ø4.5 mm)** is used for fixation and compression in the most proximal hole in the plate.

**Ø5.5 mm self-tapping Locking Cortical Screws** are used for fixation.

**The Twin Hook Locking Plates** are available with a plate barrel angle of 130°, 135° and 140° and with either 3 or 4 holes.

All plates have **tracks** for the Lateral Support Plate.

The distal part of the plate has a built in **periost elevator.**

Patent no: 0201058-5
Patent no: 0203583-0
Design patent no: 55409

The Twin Hook Locking Plate has been developed in cooperation with Dr. Jonas Bergström.
Features and benefits

Minimally invasive

- There are two reasons why the Twin Hook Locking Plate in combination with the Hansson Twin Hook can reduce the skin incision by 2/3 compared to a standard compression hip screw system.
  1. The Twin Hook Locking Plate can be inserted prior to the insertion of the Hansson Twin Hook.
  2. The oblique placement of the Ø5.5 mm Locking Cortical Screws.

- The incision is slightly more proximal than for a standard compression hip screw, allowing the Lateral Support Plate to be inserted without extending the skin incision.

Strong fixation in the lateral cortex

- The Ø5.5 mm Locking Cortical Screws are locked in the plate.
- The oblique Ø5.5 mm Locking Cortical Screws have 50% larger contact area against cortical bone than Ø4.5 mm cortical bone screws placed at a 90° angle.
- The total length of the 3-hole Twin Hook Locking Plate and its locking screws (through the bone) is equal to the length of a 4-hole standard hip plate. The length of the Twin Hook Locking Plate is 30 mm shorter than a 4-hole standard hip plate and still offers a stronger construct.

Easy and straight forward surgical technique

- The surgical technique is simplified by inserting the Twin Hook Locking Plate prior to the insertion of the Hansson Twin Hook. The distal part of the plate has a built in periost elevator.
- The unicortical self-drilling/self-tapping Cortical Bone Screw compresses and locks the plate to the lateral cortex. No pre-drilling or measuring is needed.
- The Protective Measuring Sleeve is threaded into the plate, protecting the soft tissue when drilling. The screw length is read on the Protective Measuring Sleeve against the black mark on the Drill.
- The Protective Measuring Sleeve can be used to introduce the Twin Hook Locking Plate through the skin incision.
Surgical technique

Indications

**Femoral neck fractures**
- 1 Twin Hook Locking Plate, 3 holes, 130-140°
  - Hansson Twin Hook
  - unicortical screw
  - 2 Locking Cortical Screws

**Stable trochanteric hip fractures**
- 1 Twin Hook Locking Plate, 3 holes, 130-140°
  - Hansson Twin Hook
  - unicortical screw
  - 2 Locking Cortical Screws

**Unstable trochanteric hip fractures**
- 1 Twin Hook Locking Plate, 4 holes, 130-140°
  - Hansson Twin Hook
  - unicortical screw
  - 3 Locking Cortical Screws

**Unstable trochanteric hip fractures with broken lateral wall**
- 1 Twin Hook Locking Plate, 4 holes, 130-140°
  - Hansson Twin Hook
  - unicortical screw
  - 3 Locking Cortical Screws
  - 1 Lateral Support Plate

This surgical technique will describe how to operate an stable trochanteric fracture.
A Twin Hook Locking Plate will be used in combination with the Hansson Twin Hook.

**Contraindications**

The Hansson Twin Hook and the Twin Hook Locking Plate is not recommended for use with pediatric hip fractures.
The physician’s education, training and professional judgement must be relied upon to choose the most appropriate device and treatment. Conditions presenting an increased risk of implant failure include:
- Any active or suspected latent infection or marked local inflammation in or about the affected area.
- Compromised vascularity that would inhibit adequate blood supply to the fracture or the operative site.
- Bone stock compromised by disease, infection or prior implantation that can not provide adequate support and/or fixation of the devices.
- Material sensitivity, documented or suspected.
- Obesity. An obese patient can produce loads on the implant that can lead to failure of the fixation of the device or to failure of the device itself.
- Patients who are unwilling or incapable of following postoperative care instructions are contraindicated for these devices.
- Other medical or surgical conditions which would preclude the potential benefit of surgery.

The surgeon must discuss all relevant risks, including the service life of the device and the need for postoperative protection of the implant with the patient, when necessary.

**Warning:** The Twin Hook Locking Plate shall only be used in combination with the Hansson Twin Hook.
1. Patient positioning

Place the patient in supine position on the fracture operating table. Position the leg on the healthy side with the hip in flexion and adequate abduction so that the C-arm can be adjusted intraoperatively for both the anterior/posterior view, and the axial view which is necessary to obtain a true axial view of the femoral neck and head.

2. Reduction

The fracture is reduced by flexion, longitudinal traction, abduction and internal rotation on a fracture table. The fracture position should be anatomical or with a slight valgus tilt. The proximal femur should be positioned so that the head and neck are parallel to the floor.

The foot should be rotated inwards and fixed between 15° and 60° of internal rotation. The patella should have an either horizontal or slightly inward position. The patient should then be prepared and draped. In unstable fractures, Guide Wires can be placed, in order to stabilize the reduced fragments.
3. Locate the optimal point for skin incision

A Guide Wire, (1) is held under AP-view of the image intensifier, above the skin anterior to the hip joint and in line with the medial cortex of the femoral neck.

A second Guide Wire, (2), is held transversely to the femoral shaft and directed against the point where the first Guide Wire and the skin meet, (A).

The second Guide Wire is then rotated around the femur until it is in a vertical position. A third Guide Wire, (3) (the first Guide Wire can be used), is held under lateral view of the image intensifier. It is placed along the midline of the axis of the femoral shaft.

A second Guide Wire, (2), is held transversely to the femoral shaft and directed against the point where the first Guide Wire and the skin meet, (A).

The point where the second and the third Guide Wire cross, (B), is the optimal starting point for the incision.
4. Make incision

A 40-60 mm longitudinal incision is made, centered over this point (B) through the skin. The deep fascia is divided in the direction of the fibres. The lateral cortex of the femur may be approached either directly or posterior-laterally by lifting the vastus lateralis muscle. The area of the femur where the plate is to be positioned is cleared with a raspatorium.

The length of the incision is approximately 2/3 of the length of the chosen Twin Hook Locking Plate.
- 3-hole Twin Hook Locking Plate, length 64 mm.
- 4-hole Twin Hook Locking Plate, length 81 mm.

5. Introduce the Angle guide

Orientation and placement of the Guide Wire is the most critical step in the whole surgical technique. In the frontal view the Guide Wire should run centrally in the femoral head.

In the lateral view, the Guide Wire should be centered in relation to the femoral head and neck.

Note! Introduce the Guide Wire through the Angle Guide before starting to drill. The threaded tip of the Guide Wire may otherwise damage the Angle Guide.
6. Guide Wire insertion

Using image intensification, once the alignment of the Guide Wire is satisfactory, it is advanced to subchondral bone of the femoral head.

The Angle Guide is placed on the lateral cortex and the 3.2 mm Guide Wire is inserted in the desired angle.

The rigid 3.2 mm Guide Wire will allow the surgeon to adjust the position of the Guide Wire slightly while drilling.

Note! The Guide Wire is single use and shall not be re-used.
7. Measuring

Introduce the Measuring Sleeve over the Guide Wire and read the length at the end of the Guide Wire. Make sure that the Measuring Sleeve is in contact with the lateral cortex before reading the length.

The measured value determines the length of the Hansson Twin Hook and the settings for the Step Reamer.

The correct depth for reaming and Hansson Twin Hook length will be 10 mm less than the measurement obtained from the Measuring Sleeve (if the Guide Wire is placed centrally in both frontal and lateral view, it is possible to deduct 5 mm instead of 10 mm).

8. Assemble the Step Reamer

The locking nut is pushed forward onto the reamer and turned clockwise as far as it will go. The pre-assembled reamer and locking nut is now ready to be slid onto the back end of the drill.

The locking nut of the Step Reamer is turned counterclockwise when the correct measurement is seen in the measurement window. The reamer depth is adjustable in 5 mm increments.

For example
- Measuring Sleeve measurement: 115 mm
- Step Reamer depth setting: 105 mm
- Hansson Twin Hook length selected: 105 mm
9. Reaming

The Step Reamer is inserted over the Guide Wire and drilling is carried out to within 10 mm of the subchondral bone.

The hole which is made in one step has three different diameters: one for the Hansson Twin Hook, one for the plate barrel and one for the junction between the plate and the barrel.

10. Plate insertion

The threaded Drill Sleeve is introduced and locked into one of the holes in the Twin Hook Locking Plate. This will facilitate the insertion of the plate.

The plate barrel of the Twin Hook Locking Plate is pushed into the reamed canal. The threaded Drill Sleeve is then removed.

**Note:** The Lateral Support Plate should always be used when the lateral cortex is fractured.

**Warning:** The Twin Hook Locking Plate can only be used with a Hansson Twin Hook!
11. Assemble the Hansson Twin Hook and instruments

Select a Hansson Twin Hook of the appropriate length. The inner introducer is inserted into the outer introducer. The inner introducer is then firmly engaged into the base of the Hansson Twin Hook.

If preoperative compression of the fracture is needed, the Hansson Twin Hook must be positioned 5-15 mm within the end of the plate barrel. (A shorter Hansson Twin Hook must be selected.)

12. Hansson Twin Hook insertion

The Hansson Twin Hook is inserted through the plate barrel, and pushed into the reamed channel.
13. Plate alignment

When the Hansson Twin Hook is in position, align the Twin Hook Locking Plate with the femoral shaft.

14. Extrude the hooks

The Introducer Handle is rotated clockwise until it meets resistance, that is, the tip of the Introducer Handle touches the tip of the Hansson Twin Hook. It is important to push forward on the handle of the outer introducer, when activating the hooks.

The hooks are activated by turning the Introducer Handle clockwise as far as it will go. Both frontal and lateral image intensification is utilized to ensure accurate placement. The introducer assembly is then removed.
15. Introduce the Unicortical Bone Screw

Before any drilling is carried out, the surgeon may reduce traction from the fracture table to allow impaction of the fracture. Care should be taken to avoid losing the fracture reduction.

A unicortical self-drilling/self-tapping 28 mm Bone Screw is introduced into the most proximal hole in the Twin Hook Locking Plate to compress the plate against the lateral cortex (not possible with an Angle Stable Cortical Bone Screw). A drilling machine is used to introduce the screw.

16. Drill for Locking Screws

The Threaded Drill Sleeve is introduced and locked into the most distal hole in the Twin Hook Locking Plate.

A pilot hole is drilled with a 4.5 mm Drill through the Drill Sleeve.
17. Measure cortical screw length

The screw length is read on the Protective Measuring Sleeve against the black mark on the Drill. In this case, the selected cortical screw length is 52 mm.

If the projecting part of the drill is positioned between two screw sizes, always choose the longer one.

18. Insert Cortical Bone Screw

The Twin Hook Locking Plate is attached to the femoral shaft with 5.5 mm self-tapping Cortical Locking Screws. The screws are inserted with a 3.5 mm Screw Driver Hex.

The cutting flutes of the cortical bone screw shall penetrate the medial cortex for maximal bone purchase. The same procedure as used when drilling, measuring and inserting the most distal 5.5 mm self-tapping Cortical Bone Screw (steps 16-18) are repeated when introducing the remaining 5.5 mm self-tapping locking screws.

**Note:** A Compression Screw can be used to compress the fracture. Too much compression might bend the hooks.
Fixation of the Lateral Support Plate (optional)

If the lateral wall is broken, a Lateral Support Plate should be used. The position of the Lateral Support Plate can be adjusted depending on the distance between the plate barrel and the greater trochanter.

The holes in the Lateral Support Plate will accept either a self-drilling/self-tapping 4.5 mm Cortical Screw or a 6.5 mm Cancellous Screw.

It is not necessary to introduce any screws through the Lateral Support Plate if the most proximal part of the plate, in its most distal position, is above the fracture line in the lateral wall. When all Cortical Screws have been inserted, the wound is closed in layers, according to the normal procedures for wound closure.

Check implant position

It is important to ensure that the Hansson Twin Hook is placed within the femoral head. This can be done by removing traction and rotating the hip under image intensification in both AP- and lateral-view.

Postoperative care

Full weight-bearing as tolerated by the patient may be allowed in elderly patients. In younger patients, partial weight-bearing is preferable.
Extraction

Should the need arise for implant removal, the Hansson Twin Hook is extracted with the Hansson Twin Hook Extractor.

The plate and the Lateral Support Plate is removed with a 3.5 mm Screw Driver Hex if needed.
## Product information

### Implants

<table>
<thead>
<tr>
<th>Description</th>
<th>Angle</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twin Hook Locking Plate</td>
<td>3 holes</td>
<td>130°</td>
</tr>
<tr>
<td>Twin Hook Locking Plate</td>
<td>3 holes</td>
<td>135°</td>
</tr>
<tr>
<td>Twin Hook Locking Plate</td>
<td>3 holes</td>
<td>140°</td>
</tr>
<tr>
<td>Twin Hook Locking Plate</td>
<td>4 holes</td>
<td>130°</td>
</tr>
<tr>
<td>Twin Hook Locking Plate</td>
<td>4 holes</td>
<td>135°</td>
</tr>
<tr>
<td>Twin Hook Locking Plate</td>
<td>4 holes</td>
<td>140°</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 28 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 32 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 36 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 40 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 44 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 48 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 52 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 56 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 60 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 64 mm</td>
</tr>
<tr>
<td>Locking Cortical Screw</td>
<td>Ø5.5</td>
<td>Length 68 mm</td>
</tr>
<tr>
<td>Instrument</td>
<td>Description</td>
<td>Code</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Unicortical Screw</strong></td>
<td>Ø4.5</td>
<td>Length 28 mm (Self-drilling/self-tapping)</td>
</tr>
<tr>
<td><strong>Instruments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protective Measuring Sleeve</strong></td>
<td>Ø4.5</td>
<td>(For Locking Cortical Screw Ø5.5 mm)</td>
</tr>
<tr>
<td><strong>Drill</strong></td>
<td>Ø4.5</td>
<td>Length 195 mm (For Locking Cortical Screw Ø5.5 mm)</td>
</tr>
<tr>
<td><strong>Guide Wire Sleeve with Handle</strong></td>
<td>Ø3.2</td>
<td></td>
</tr>
<tr>
<td><strong>Positioning Template for Twin Hook Locking Plate</strong></td>
<td>130-140°</td>
<td></td>
</tr>
</tbody>
</table>
IFU

For the latest version of this Instruction For Use. Please visit:
http://download.swemac.com/Hansson-Pin-System
Swemac develops and promotes innovative solutions for fracture treatment and joint replacement. We create outstanding value for our clients and their patients by being a very competent and reliable partner.