HANSSON TWIN HOOK®

Hip Fracture System
The Hansson Twin Hook is a new concept for the treatment of trochanteric hip fractures. Its development is based on the long and successful experience with the Hansson Pin System®. The Hansson Twin Hook offers a STRONG, STABLE FIXATION with MINIMAL SURGICAL TRAUMA.

The Hansson Twin Hook consists of two parts, an inner sliding tongue and an outer pin. The outer pin is 8.9 mm in diameter. Fixation in the femoral head is achieved by pushing the inner sliding tongue out through the proximal windows. The hooks are 4.6 mm in width and extend outward in a gentle curve 11 mm on each side of the outer pin.

The Hansson Twin Hook is used in combination with the Swemac Hip Plate or the Medoff Sliding Plate® (Figs. 2 and 3).

Each implant is individually packaged sterile for immediate use and greater inventory control. All implants are made from stainless steel 316 LVM.

Hansson Twin Hook
Patent no: 0201058-5
Patent no: 0203583-0
Design patent no: 55409
High resistance against femoral head penetration

Loading and deformation tests using cadaver femoral heads have shown that the Hansson Twin Hook behaves differently, compared to the compression hip screw. In case of impaired sliding between the Twin Hook and the plate/barrel, the compressive forces are transmitted to the fixation of the Hansson Twin Hook in the femoral head rather than to the fracture (Fig. 4).

If the compression screw moves, the bone is stripped. With the Hansson Twin Hook, instead of stripping the bone, the hooks will gradually bend, making this a more forgiving and durable fixation.

Load and deformation test

The Hansson Twin Hook showed better resistance in cadaver femoral heads than the compression hip screw in the important area close to or in the subchondral bone.

Note: The test was done with the first version of the Hansson Twin Hook. The outer pin was 8 mm in diameter and the width of the hooks were 3.8 mm. The frontal area of the current version of the Hansson Twin Hook is 25% larger than the one used in this test.
Load-deformation tests

These radiographs were taken of the test specimens during load-deformation tests in axial loading of a compression hip screw and a Hansson Twin Hook in 160 kg/m³ foam, during 8 mm deformation.

Impaction of bone – maintained fixation

The radiograph to the left shows the Hansson Twin Hook after being inserted in artificial foam material. The radiograph to the right shows the Hansson Twin Hook after being pushed forward 8 mm.

The Hansson Twin Hook maintains full torsional resistance after compression, making this a more forgiving and durable fixation than the compression hip screw.

Stripping the bone – loss of fixation

The radiograph to the left shows the compression hip screw after being inserted in artificial foam material. The radiograph to the right shows the compression hip screw after being pushed forward 8 mm. The compression screw is now loose and has been retracted to starting position without resistance, as shown in the radiograph.

The compression hip screw lost fixation after 1 mm of compression and cannot provide any torsional resistance anymore.
High resistance against displacement

Two hooks are positioned anterior and posterior with a total hook span of 31 mm. The hooks will be in contact with both cancellous and subchondral bone in the femoral head, providing a very good support against displacement.

The Hansson Twin Hook will allow full bone and implant surface contact along the entire implant for better support against varus angulation (Figs. 5 and 6).

Torsional test

Torque deformation graph showing torsional loading of a compression hip screw and a Hansson Twin Hook in two femoral heads with bone mineral density of 260 and 310 kg/m³ respectively, during 40° clockwise and 40° counter-clockwise rotation.

The Hansson Twin Hook gives 2-3 times better rotational resistance in cadaver femoral heads than a compression hip screw. Rotational stability of the Hansson Twin Hook in the plate barrel is ensured through bilateral flattening of the shaft to match the inside of the hip plate barrel.

Note: The test was done with the first version of the Hansson Twin Hook. The frontal area of the current version of the Hansson Twin Hook is 25% larger.
**MINIMAL SURGICAL TRAUMA**

Unlike other devices, such as the standard compression hip screw system, the Hansson Twin Hook and operative procedure are both designed to minimize surgical trauma.

**No rotational forces during insertion**

The Swemac Hip Plate is inserted through a 50 mm skin incision.

The plate/barrel is pushed into the pre-drilled hole in the lateral cortex.

The Hansson Twin Hook and the introducer assembly are inserted through the plate/barrel and used as a joystick. When the Hansson Twin Hook have reached its final position, the introducer handle is turned clockwise as far as it will go.

All cortical bone screws securing the plate to the shaft can be introduced through the same skin incision.

The smooth profile of the implant allows the Hansson Twin Hook to slide into place without twisting or hammering, thus minimizing the risk of displacement and greatly improving the chance of preserved femoral head vitality.

**Minimal operative exposure**

The complete procedure can be carried out through a 30-70 mm skin incision. A minimal operative exposure offers the following potential benefits:

- Reduced bleeding
- Reduced need for blood transfusion
- Shorter operating time
- Reduced risk of infection
- Less postoperative pain
- Early mobilisation
- Early return to pre injury status
- Cosmetic, patient satisfaction
Minimal damage to cancellous bone

The damage to cancellous bone when using the Hansson Twin Hook is approximately 50% less when compared to a compression hip screw.

Percutaneous removal procedure

The Hansson Twin Hook can be removed through a 10 mm skin incision without the need to remove the plate. The operation can be performed under local anaesthesia. Percutaneous removal can be advantageous in the case of a femoral head penetration, or if the patient suffers from soft tissue irritation after fracture healing, caused by the distal end of the Hansson Twin Hook protruding into the soft tissue.

The Hansson Twin Hook has penetrated the joint (Fig. 7). It was removed through a 10 mm skin incision under local anaesthesia and a new shorter implant was inserted. The fracture is stable, due to previous impaction, and healed successfully (Fig. 8).