Omega3 System

Compression Hip Screw
Hansson Twin Hook

- Hip Fracture
- Axially Stable Locking Option
Hip Fracture Treatment with Omega3

Omega3 Hip Fracture System

Based on long experience – quick, safe and less invasive operative technique, combined with excellent clinical results. [3]

Relative Indications

The Omega3 System is indicated for fractures of the proximal femur which may include:

- Trochanteric fractures and subtrochanteric fractures
- Intracapsular and basal neck fractures

Note: When using the Omega3 Lag Screw System, if there is rotational instability, it is recommended that an Asnis III 6.5mm Cannulated Screw or Hansson Pin be added to stabilize the fracture.
The Omega3 System offers the surgeon a wide choice of slimlined hip plates combined with a unique option of cephalic implants and state of the art instrumentation. The system provides a potentially simple and easy-to-use solution for surgeons facing hip fractures.

Only the Omega3 Hip Plates offer the possibility to arbitrarily apply monoaxial stable fixation with 5.0mm Locking Inserts and Locking Screws in the plate diaphysis as well as standard 4.5mm Cortical Screws, 6.5mm Cancellous Screws and Asnis III Cannulated Screws.

To apply Locking Inserts and Locking Screws to the Omega3 Hip Plate, the appropriate locking instrumentation is available in the optional locking instrument set.
Axial Stability

On Demand increased Stability of the Hip Plate, due to axial stable Locking Screws

The Omega3 system allows the surgeon to decide pre- or even intraoperatively to add axial stable screws to lock the Hip Plate to the femoral shaft.

This might be of importance when the quality of bone is poor and only detected by tactile feeling during the operative procedure.

Axial stability with 5.0mm Locking Inserts and corresponding Locking Screws allows for increased \cite{1} stability. This may be of advantage for early mobilisation and when the bone density or bone quality is limited.

Stable Fixation

On demand axial stable fixation with 5.0mm Locking Inserts and Locking Screws or standard screw fixation.

Unique Locking Screw Design

Screw is guided into the Locking Insert Reduced potential for cross threading and cold welding. T-Drive Recess improves torque transmission.

Axial Stable, 14° Diverging Locking

Monoaxial stable fixation in combination with diverging Locking Screw configuration results in increased stability. \cite{1}

Optional Standard Cortical Screw Configuration - non axial stable

The Omega screw hole allows the usage of standard screws. i.e. Cortical Screws, Cancellous Screws or Asnis III Cannulated Screws, or in combination with a Locking Insert and Locking Screw.
Omega3 Implant Portfolio

Hip Plate allows for Twin Hook or Standard Lag Screw Technique

**Lag Screw**
- Standard Ø13mm Lag Screws and Ø15mm Super Lag Screws in lengths from 50 to 140mm.

**Twin Hook**
- Unique Cephalic implant for the femoral head fixation in lengths from 50 to 140mm.

**Compression Screw – available for Lag Screw or Twin Hook**
- The compression screw allows for controlled fragmentary compression.

**Complete Portfolio – Omega3 Plates**
- Slim Line Plate design in coldworked 316L stainless steel and corrosion resistant surface treatment - chamfered at the end for easy slide in when used in minimal invasive approach.
- 130° to 150° CCD angles, in 5 degree increments; standard or short barrel; keyed or keyless; 2 to 12 hole plate lengths; 95° Supracondylar Plates from 6 to 14 holes. This allows for choice of optimal implant in a wide range of anatomic situations.

**On Demand axial stable Locking Option**

**Standard**
- Shaft holes allowing compression, neutral or buttress fixation with standard Cortical Screws.

**Locking**
- Accept Locking Insert for axially stable fixation with Locking Screws.

**Lag Fix for Omega3**
- Void filling hydroxyapatite to increase bone to implant interface for the Lag Screw, for more details please refer to page 9.
Minimally Invasive Operative Technique with Twin Hook

The Omega3 System allows implanting of a compression hip plate in a minimal invasive manner. This is achieved either by using axial stable plates that allow to reduce the plate length and thus the length of incision [4], or the rotational stable [1-3], and innovative Twin Hook instead of the standard Lag Screw, where the operative technique allows to slide in the plate first and then insert the Twin Hook through the 2 to 4cm incision.

Minimally Invasive Twin Hook Technique

1. Insertion of the Omega3 Hip Plate before insertion of the Twin Hook. This sequence allows for a more minimally invasive approach compared to the Standard Lag Screw technique.

2. Sliding-in of Omega3 Hip Plate below the soft tissue along the femoral shaft.

3. The Twin Hook Instrumentation serves as ‘Joystick’ for Hip Plate manipulation and Twin Hook insertion.

4. Final placement of the Twin Hook and deployment of the hooks without the risk of intraoperative femoral head rotation.

Small incision size with Twin Hook technique.

Removal and Revision of Twin Hook:

Minimally invasive surgery is allowed with Twin Hook twofold: During insertion and extraction. Especially when implant removal or revision is indicated, this system allows for a smaller incision compared to the standard Lag Screw technique [3].

Standard Lag Screw Technique

Standard Lag Screw technique asks for placement of the Lag Screw before the plate. The incision length is related to the length of the chosen Hip Plate.
Increased Bone to Implant Stability

Excellent Rotational Stability combined with Minimally Invasive Surgery

Compared with the Standard Lag Screw System, the Twin Hook requires no tapping and no torque for insertion into the femoral head. It limits the risk of intraoperative head rotation.

An additional anti rotation screw may not be necessary in rotational unstable fractures. Shorter OR time may be the result of this easier approach which may amount to less intraoperative blood loss, less pain and earlier mobilisation.

This may reduce the period of hospital stay and may reduce overall treatment costs.

Excellent Bone-to-Implant Contact for superb Stability along the sliding Channel of the Twin Hook compared to the Standard Lag Screw

The frontal surface area of the Twin Hook is 30% larger than a Compression Hip Screw

The increased surface of the Twin Hook gives excellent push- and pull-out strengths compared to standard Lag Screws.

This is combined with superior rotational stability. Cut-out rate of Twin Hook is comparable to standard Lag Screw technique. [1-3]

[1] O.Olsson, K.E. Tanner, L. Ceder, L. Ryd; A biomechanical study on fixation stability with Twin Hook or Lag Screw in artificial cancellous bone; Published in International Orthopedics (SICOT), 2002 26:349 -355
[4] Enhanced fixation with a locked Hip Plate

Stryker Osteosynthesis

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Enhanced Stability of axial stable Locking

Biomechanical tests with Omega3 showed excellent stability compared to standard Compression Hip Screw configurations [4]

Slim and Improved Omega3 Hip Plate design

For product safety the new slim lined design of the Omega3 Hip Plate was compared to a clinically proven implant using standard test configuration. Omega3 showed superior fatigue strength in standard screw configuration compared to one of the most common used Dynamic Hip Screws on the market [4].

Axial Locking increases Implant Stability and allows for shorter Hip Plates, thus allowing for less invasive Surgery [4]

Bone to implant failure of a 4-hole Omega Plate in standard Cortical Screw configuration.

Test results of the 3 tested configurations: Omega3 with 4-hole plates in standard cortical or axial stable Locking configuration and 3-hole Omega3 plates in axial stable Locking configuration.

To compare different screw configurations with standard or axial stable Locking Screws in a bone model with a reduced cortical thickness, thus simulating bad or osteoporotic bone quality, a modular test fixture was developed based on standard testing procedures. The two cortices were simulated by metal powder reinforced Polyurethane discs machined to a thickness of 2mm and to fit the oblong hole. The properties of this material are comparable to human cortical bone. For all tested specimens the screws pulled out of the bone simulation material (see figure) The implants itself did not fail and were still intact.

Results:
The 3-hole Omega3 Plates with axial stable Locking Screws showed better biomechanical strength of the bone-to-implant interface compared to the 4-hole Omega3 Plates with standard Cortical Screw fixation. This allows for a more minimally invasive approach with shorter incisions and less bone removal due to reduced amount of screws with shorter plates or for increased stability in poor quality bone.

[4] Enhanced fixation with a locked Hip Plate

1 Stryker Osteosynthesis

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Omega3 with Lag Fix
Hydroxyapatite Bone Void Filler for use with Omega Lag Screws

Lag Fix is a sintered body made of hydroxyapatite granules which are an artificial biomaterial for reconstructing defects in bone. This artificial material is homogeneous with biological apatite, which is the main inorganic ingredient of bone, and is fully compatible with biological tissues.

The inserter is intended to safely store the Lag Fix during transportation and to safely place Lag Fix in the bone. Lag Fix is used in conjunction with the Omega Lag Screw. Lag Fix is intended for filling bone voids in cancellous bone. The Lag Fix may be used in combination with the Omega Lag Screw and is intended for the temporary stabilization of bone segments or fragments until bone healing has been achieved.

The use of Lag Fix is optional, the function of these implants is not compromised if they are used without Lag Fix [5].

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Easy to use Instrumentation

Easy to use Twin Hook Insertion Instruments

Stryker developed state of the art instrumentation that allows for a minimally invasive approach. The Fixed Angle Guide with reduced touching surface or the joystick-like Introducer for Twin Hook are only two of the innovations for minimally invasive surgery for compression Hip Plate treatment method.

Accurate and Radiolucent Angle Guides

Angle Guide Radiolucency

Radiolucency of the angle guide body to precisely position the instrument, and therefore the Guide Pin.

Multiple Guide Pin Holes

Multiple guide pin holes for accurate placement of the Guide Pin without need to remove the instrument.

Variable Angle Guide and 135° Fixed Angle Guide

Variable Angle Guide with “freehand” technique option.

Stiff CoCr Ø2.8mm Guide Pin

Stiff CoCr Ø2.8mm Guide Pin for reduced deflection. Available also with quick coupling for increased interface between the power tool and the Guide Pin.
Layout of the Metal Trays sequenced according to the Surgical Technique

The new sterilizing trays allow modular configuration to meet customer specific set contents

Basic and optional modular sets offer either standard Lag Screw, Twin Hook or axial stable Locking configuration.

Basic Lag Screw Tray, empty
(REF. 902120) - here shown fully equipped including the Omega3 Cortical Screw Rack (REF. 902116). Alternatively an Omega3 Basic Silicone Mat (REF. 902112) may be added. This allows for a even more individual set configuration: i.e. add the Variable Angle Guide, One-Step-Insertion instrumentats, etc.
For this tray a Lid (REF. 902121) is available as well.

The Large Metal Case, empty
(REF. 902100) with Lid (REF. 902101) allows to store two trays, e.g. Basic Lag Screw Tray and an Optional Locking Tray or a Basic Twin Hook Tray and an Optional Locking Tray.

Omega3 Optional Locking Tray, empty
(REF. 902130) - here shown fully equipped including the Omega3 Locking Screw Rack (REF. 902115) and the necessary Locking Instruments to perform axial stable fixation of the Omega3 with Locking Inserts and Locking Screws. For this tray a Lid (REF. 902131) is available as well.

The metal trays are designed according to Stryker’s latest sterilization and drying specifications, thus allowing for quality acceptance of central sterilization units as well as inhouse sterilization procedures. [6]

The Omega3 Optional Instrument Tray, empty
(REF. 902135) - here shown equipped with some optional instruments like the Angle Guide for Supracondylar Plate, Barrel Reamer Short, One-Step-Insertion-Instruments, etc.
For this tray a Lid (REF. 902136) and Silicone Mats (REF. 902113) are available as well.

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