

Congresses and Events

Please contact your local Aesculap representative for more details on the congresses and meetings mentioned below:

- International Interlocking Course for surgeons February 21/22, 2011
Berlin
- ESTES April 27/30, 2011
Milan
- International Targon User Meeting, May 26/27, 2011
Windsor/UK



Targon TX

- Angular stable fixation prevents secondary axial malalignment
- Extended indication range to treat extreme metaphyseal tibial fractures
- Short tibial nail for isolated proximal tibial fractures



Targon FN

- About 4.000 implantations to date
- Targon FN reduces the complication rate in the treatment of femoral neck fractures by about 30 %
- Targon FN is a breakthrough in treating femoral neck fractures

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Targon TX – Tibial fracture fixation going to extremes

Introduction:

Metaphyseal tibial fractures produce specific problems if they are treated with intramedullary nailing. Primary malalignment (during operation) and secondary malalignment are results of different specific conditions.

Reasons for primary malalignment are: Wrong nail insertion point, passing of the nail through the isthmus with resulting posterior stress at the proximal fragment, tendon traction from the hamstrings, the quadriceps and the

gastrocnemius muscle. The main reason for secondary malalignment is the insufficient fixation of the proximal fragment.

Insufficient interlocking results in an incremental angulation of interlocking bolts, unidirectional interlocking and low purchase of the bolts in the cancellous and thinning cortical bone.

Another reason for the loss of reduction is osteoporotic bone with thin cortex. The same problems of primary and secondary malalignment exist in distal tibial fractures. Because of the thin soft tissue coverage in these fractures, the intramedullary procedure has a huge benefit. Because of reduced and high proximal interlocking options in a conventional nail, a stable fixation of a very distal fragment distal fragment is difficult.



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Dear Targon User,

Targon TX is another promising new generation system in the Targon family providing angular stable fixation in treating extreme metaphyseal tibial fractures. Hermann Josef Bail MD from Nuremberg presents his first clinical experience with Targon TX highlighting the specific features with regards to the clinical relevance.

The innovative Targon FN is continuing its success story by improving surgical outcome rates for hip fracture repair. In a recent article of the British 'hes' magazine for healthcare equipment, the Targon FN was referred to as a revolutionizing new treatment method reducing complication rates by around 30 %. Find the latest summary of results by Martyn J Parker MD in this edition.



I should like to thank the authors for sharing with us their results and giving insights into new treatment options.

Enjoy reading,
Doris Zimmermann
Product Manager Trauma
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Methods:

There are multiple methods to avoid primary and secondary malalignment. First the insertion point has to be optimal at the anterior edge of the proximal tibia. A curved nail helps to minimise the posteriorly directed pressure when a long nail passes the isthmus.

To avoid this dislocation force, a short nail which will not pass the isthmus is the optimal implant for isolated proximal tibia fractures. To avoid the displacement due to tendon traction, interlocking with the knee in extension position is desirable. Holding of the proximal fragment and the reduction with additional external fixators, plates and forceps may be helpful. The most elegant way to reduce the proximal fragment and to provide better stability is the insertion of trans-medullary support screws. Another advanced method to reduce the proximal fragment is to rotate a curved nail.

To avoid secondary malalignment, improved interlocking is the most important measure. In the Targon TX range we have multiple interlocking options in several directions. Another important improvement in the Targon TX is the angular stability of the proximal interlocking bolts which results from a special thread design with a double start thread in the nail. Axial pre-tension in the nail/bolt interface leads to the so called zero-motion-effect when at least three screws are used. Also helpful against secondary dislocation is the bone-bone-contact of the fragments by using the so called „Backstroke technique“ or compression of the fragments.

Targon TX nail offers two different possibilities to compress the fracture. In distal tibial fractures the same principles can be applied. Transmedullary support screws are helpful to obtain reduction and improve the fragment fixation. Very far distal interlocking options in the Targon TX help for excellent interlocking of very short fragments. Different proximal end caps allow to equate the nail length if the nail is inserted close to the joint line. Especially in osteoporotic bone and in segmental fractures with long intermediate segments the angular stable nailing with multiple proximal and distal interlocking options is a perfect and minimal invasive stabilisation method.

Conclusion:

New generation nails such as the Targon TX help to extend the indications to extremes in metaphyseal tibial fracture treatment.

The TX Nail is especially helpful in extremely proximal and distal fractures, segmental fractures and in osteoporotic bone. In particular, the angular stability helps to avoid secondary malalignment. However, nailing of epi- or metaphyseal tibial fractures is still a demanding procedure. Therefore good education (for example how to use transmedullary support screws) is mandatory to avoid disappointing results when using this very promising technique.

PD Dr. med. Hermann Josef Bail

Compression and dynamic fixation options



Compression with internal compression screw



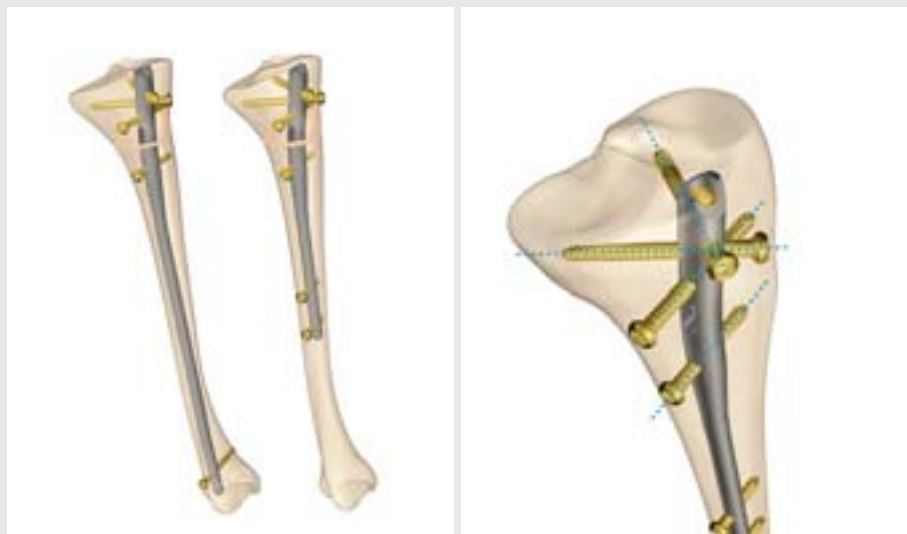
Compression with external compression instrument

Reduction with a transmedullary support screw



Figure 1

Proximal design – Angular stable fixation in the epiphysis in long and short nail



Figures 2, 3

The Targon FN (femoral neck) implant

Internal fixation of an intracapsular hip fracture has always been an operation fraught with complications. Conventional fixation implants will often fail to hold a displaced fracture in its reduced position to allow the fracture to heal. This occurs in approximately a third of displaced fractures. The Targon FN has been specifically

designed to try to reduce the occurrence of these fracture healing complications. It combines the advantages of the two most commonly used implants to fix this fracture that is the sliding hip screw (SHS) and multiple cancellous screws. The SHS has the advantage of allowing some collapse to occur at the fracture site because of its dynamic sliding ability.

In addition the side plate provides good fixation of the distal side of the fracture. Both these attributes are incorporated into the Targon FN.



Figure 6

Multiple cancellous screws have the advantage of achieving a good fixation on the femoral head and linking two or more screws together with a locking side plate provides rotational stability. The Targon FN has the capacity for two, three or four cancellous screws to be accurately positioned within the femoral head (figure 6).

Other advantages of the Targon FN is the implant is made of Titanium, allowing MRI or CT scans of the femoral head to be undertaken. In addition the alignment jig for the implant makes the insertion technique easier with minimal surgical exposure of the femur. The implant has been available for us since August 2006, initially as a prototype design and latterly as the current design. To date 258 consecutive patients have been treated with this implant with a minimum follow-up period of four months. The mean age of the patients was 76 years (range 38-103), 41 % were male. Mean length of surgery was 46 minutes and the mean operative blood loss was estimated to be 128 mls. Eight patients required a blood transfusion. The mean total hospital stay which included all time within a rehabilitation ward was 13 days (median 9 days).

For the displaced fractures 62 % were Garden grade III and 38 % were Garden grade IV. Superficial wound sepsis requiring antibiotics occurred in two patients and one patient developed deep wound sepsis and had a girdlestone excision arthroplasty.

The occurrences of fracture healing complications are as shown in the table below.

These results compare favourable with those after internal fixation with conventional implants. Lu-yao et al (1994) reported a non-union rate of 33 % for displaced fractures and an avascular necrosis rate of 16 %. For undisplaced fractures treated with multiple cancellous screws a non-union rate of 6 % and avascular necrosis rate of 4 % has been reported (Conn and Parker 2004). Overall the results to date indicate a complication rate of about a third of contemporary implants (see page 7: 30 % reduction of the complication rate)

Surgical aspects of the Targon FN

1. Indications

The current indications in our unit for the Targon FN are

- Undisplaced intracapsular fractures
- Minimally displaced intracapsular fractures
- Displaced intracapsular fractures in the young (aged less than approximately 70 years)
- Displaced intracapsular fractures males (male patients have less fracture healing complications than women)
- Displaced intracapsular fractures in the very frail (those patients in which the more extensive procedure of replacement arthroplasty may be associated with a higher mortality or morbidity)

2. Fracture reduction

The commonest surgical mistake when fixing an intracapsular fracture is failure to adequately reduce the fracture. Reduction in the anterior-posterior plane is readily achieved by applying longitudinal traction under x-ray control. Reduction in the axial view requires internal rotation and this may require some force in a muscular patient to achieve and maintain the full internal rotation that is required to reduce some fractures.

The normal curves of the femoral neck should be restored (figures 10 and 11).

3. Screw positioning

The alignment jig for the Targon FN forces at least two screws to be correctly



Figures 7, 8, 9

A displaced intracapsular fracture in a frail patient aged 103 years treated by reduction and fixation with the Targon FN implant. The patient was discharged back to her residential home five days after surgery. She regained a similar degree of mobility as prior to the fracture but was too frail to attend any radiographic follow-up. She lived for a further year and a half without any problems with the hip.

placed, even if the other screws are peripherally placed. Ideal placement is for the screws to be central or inferior on the anterior-posterior radiograph and central or central/posterior on the lateral radiograph.

4. Three of four screws

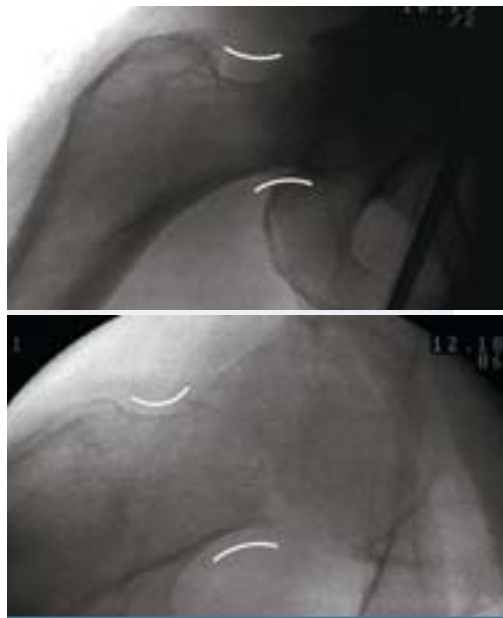
It is unknown whether four proximal TeleScrews screws are superior to three TeleScrews. My current practice tends to be to use four screws for displaced fractures in those with a large to medium sized femoral head and three screws for all undisplaced fractures.

5. Missed distal locking screws

Occasionally the plate of the Targon FN is not completely aligned with the shaft of the femur, such that only one of the two distal screws can be inserted into the centre of the femur. In this situation either the plate has to be realigned or it is acceptable to just use one distal locking screw.

6. Weight bearing

My current practice is to allow all patients to be fully weight bearing without any restriction on hip function after fixation of a fracture with a Targon FN. The only exception to this may be a patient aged less than about 50 years with a displaced fracture that has been reduced and fixed, in which a period of about six weeks partial weight bearing is advised. At present there is no supporting evidence from clinical studies that restricting weight bearing will reduce the occurrence of fracture healing complications. In conclusion, the results to date suggest that the Targon FN may be a significant advance in the treatment of this difficult fracture but further independent studies will be required to confirm this.



Figures 10, 11

Correct reduction of a displaced intracapsular fracture to restore the normal curves around the femoral neck.

References

Lu-yao GL, Keller RB, Littenberg B, Wennberg JE. Outcomes after displaced fractures of the femoral neck: a meta-analysis of one hundred and six published reports. J Bone Joint Surg. 1994;76-A:15-25. Conn KS, Parker MJ. Undisplaced intracapsular hip fracture: results of internal fixation in 375 patients. ClinOrthopRelat Res. 2004;421: 249-254.

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