



## Osteosynthesis of a periprosthetic fracture of the proximal femur with the distal femur LISS® system

Jan Robert TARNOWSKI, Kim HOLCK

From Hvidovre Hospital, Ortopæd kirurgisk Afdeling, Hvidovre, Denmark

**In this case report, we show how it is possible to perform osteosynthesis using minimal invasive techniques instead of conventional methods. In this instance the osteosynthesis was performed on a patient in poor general condition who had presented a periprosthetic fracture of the proximal femur. For the osteosynthesis the Less Invasive Stabilization System intended for distal femur fractures was used with success.**

**Keywords :** proximal femur ; periprosthetic fracture ; internal fixation ; LISS ; Less Invasive Stabilization System ; minimally invasive surgery.

### INTRODUCTION

Minimally invasive surgical procedures are now used in orthopaedic surgery as well as in other surgical specialties. One of these techniques used for internal fixation of distal femur fractures uses the so-called LISS® (Less Invasive Stabilization System) (2).

The LISS® system consists of a plate, which is anatomically molded to fit the distal femur and condylar area. The plate comes with locking screws in the shaft and condylar part.

The plate is inserted through a small incision over the lateral aspect of the distal femur, and the screws are fitted perpendicularly with the aid of a guiding system to provide angular stability in the femur shaft and the condylar region. Because of the

angular stability, the LISS® system provides a load transfer over the screws and along the femur axis (1,2).

Owing to its reduced invasiveness, the LISS® system may also reduce the risk for some of the complications seen after conventional surgery, such as non-union, joint stiffness, refractures and infections (1,4).

This case story is about internal fixation with the LISS® system of a proximal femur fracture around a hip hemiarthroplasty in an elderly male patient with severe systemic illness. Spiral fractures around hemiarthroplasties are common complications in elderly patients with osteoporosis (3).

### CASE REPORT

A 91-year old male patient was admitted to the orthopaedic department with a displaced femoral neck fracture. A non-cemented hemiarthroplasty

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■ Jan Robert Tarnowski, MD, Resident in Orthopaedic Surgery.

■ Kim Holck, MD, Senior Consultant.  
*Hvidovre Hospital, Ortopæd kirurgisk Afdeling, Hvidovre, Denmark.*

Correspondence : Jan R. Tarnowski, Ortopædkirurgisk Afdeling Hvidovre Hospital, Kettegård Allé 30, 2650 Hvidovre, Denmark. E-mail : jantarnowski@yahoo.dk

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*Fig. 1.* — AP radiograph showing the right hip with a peri-prosthetic fracture of the proximal femur.



*Fig. 2.* — Radiograph after internal fixation of the peri-prosthetic fracture with the LISS system.

was planned for the following day. During the first day of hospitalisation it was discovered that the patient suffered from a severe acute myocardial infarction, for which reason he was transferred to a cardiology department for treatment. He was transferred back shortly after treatment, and the planned hip surgery was completed. The surgical procedure was performed as planned and there were no immediate complications. However, a few days after surgery the patient's heart condition worsened and once again he underwent treatment in the cardiology department. He was subsequently started on physical therapy, but he fell and broke his femur. Radiographs showed that he had sustained a spiral fracture of the proximal femur around the hip prosthesis. The prosthesis was still stable, but the patient had to undergo a further surgical procedure (fig 1).

Because of the patient's age, heart condition and osteoporosis, it was determined that the best treatment option would be to stabilise the fracture with a LISS® system.

### Surgical procedure

Under combined general and spinal anaesthesia, the fracture was realigned by manipulation under fluoroscopic guidance. An incision was made over the greater trochanter. The LISS® plate (using a left plate for the right femur) was inserted and temporarily fixed to the bone with two K-wires. The internal reducing tool, which is part of the LISS® system was used to further realign the distal fragment, before fixating the LISS® plate with 6 unicortical screws proximally and with bicortical screws distally.

The patient received 1.5 g Cefuroxim intravenously during surgery and 750 mg Cefuroxim after completion of the procedure.

The surgical procedure was performed without any complications and it was possible to mobilise the patient with a walker without any pain. Within a few weeks he was able to walk 30 meters with partial weight bearing using the walker.

The radiograph taken after surgery showed that the fracture was stable, and that no further surgery was necessary (fig 2).

Six months later the patient's condition had markedly improved and he denied further follow-up hospital visits.

### DISCUSSION

This case story shows that it is possible to use minimally invasive techniques to treat periprosthetic fractures of the proximal femur, even though the plate used was developed for fractures of the distal femur. Nevertheless, as mentioned earlier, it is a topic of discussion whether some of the usual complications (non-union, joint stiffness, refractures and infections) can be minimised when using the Less Invasive Stabilization System (1,4).

This procedure is especially valuable for elderly patients with poor general condition, because of its less invasive nature.

We have found no documentation of other cases where osteosynthesis of proximal femur fractures has been treated using the LISS® system. We therefore believe that it would be of interest to initiate a study and eventually develop a similar plate for internal fixation of proximal femur fractures.

### REFERENCES

1. **Hailer YD, Hoffmann R.** Management of a nonunion of the distal femur in osteoporotic bone with the internal fixation system LISS (Less Invasive Stabilization System). *Arch Orthop Trauma Surg* 2006 ; 126 : 350-353.
2. **Krettek C, Schandelmaier P, Tscherne H.** LISS : Less Invasive Stabilization System. *AO International Dialogue* 1999 ; 12, issue I, June, clinical zone 3.
3. **Mclauchlan GJ, Robinson CM, Singer BR, Christie J.** Results of an operative policy in the treatment of periprosthetic femoral fracture. *J Orthop Trauma* 1997 ; 11 : 170-179.
4. **Wong MK, Leung F, Chow SP.** Treatment of distal femoral fractures in the elderly using a less-invasive plating technique. *Int Orthop* 2005 ; 29 : 117-120.