Diaphyseal partial replacement with sleeve coupling for interprosthetic femoral fractures

An 84-year-old patient with right knee and hip prostheses was treated with a a plate osteosynthesis following an interprosthetic femoral shaft fracture. Two months post-op, the plate failed. The surgeon, Dr. med. Karl Schmoranzer, chief physician at the Department of Orthopedics and Traumatology at the Martin Luther Hospital in Berlin, ordered a customized component from LINK to provide a strong connection for the prosthesis stems.

Findings

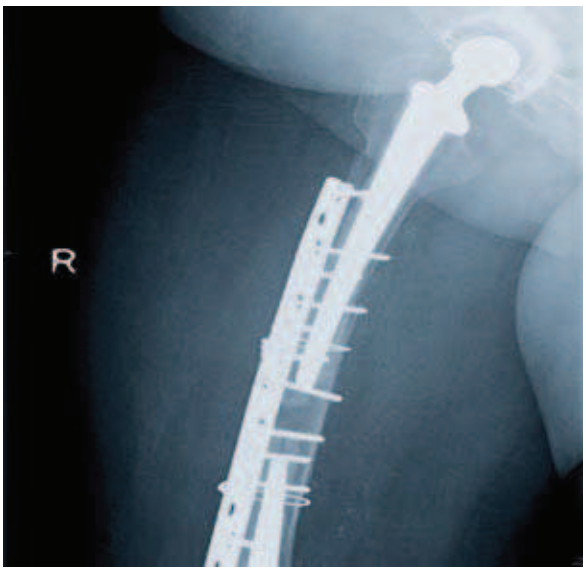
84-year-old female patient with right femoral shaft fracture between LINK SPII® Hip Prosthesis and LINK® Endo-Model® Rotational Knee Prosthesis, sustained due to a fall; treatment with plate osteosynthesis; plate failure with pseudarthrosis of the femoral shaft after two months; patient unable to walk.

Requirements

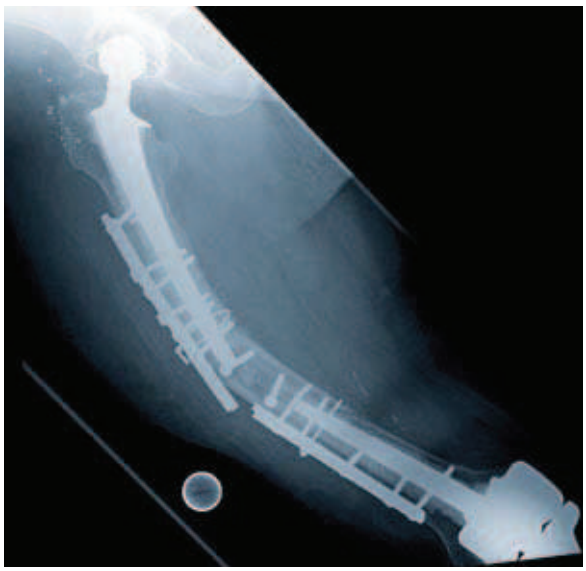
Fabrication of a customized component in order to preserve the perfectly functional hip and knee joints and to achieve a strong connection of the prosthesis stems. Postoperative mobilization of the patient in a wheelchair without full loading.

Customized solution

After assessing the X-ray images, a customized interposition double sleeve was fabricated. The sleeve comprises a proximal and a distal component, each with nine stem securing screws and two coupling locking screws, including two plastic stoppers.



Interprosthetic femoral fracture caused by a fall: Plating of the femur shaft with in-situ LINK® Endo-Model® Knee Prosthesis and LINK® SPII® Hip Prosthesis



Two months after plate osteosynthesis: Fracture of the plate with interprosthetic femoral fracture

Implantation

During the operation, Dr. Karl Schmoranzer exposed 80 mm of each of the in-situ shaft ends. The sleeve components were filled with cement and slid into place. The fixation screws were then tightened in the still pasty cement. This allowed the in-situ shafts to be centered in the sleeve components and to be additionally fixed. To conclude, the two sleeve components were joined together. The interposition sleeve was preferred principally because it entailed a significantly smaller intervention than the otherwise necessary total femur replacement.

Conclusion

In order to restore mobility to the 84-year-old patient after failed plate osteosynthesis (following femoral shaft fracture) and plate failure, LINK manufactured a customized interposition prosthesis. This made it possible to stabilize the affected limb. After geriatric treatment, the patient is independently mobile on underarm crutches.

Left: **X-ray image with projected plan:** diaphyseal partial replacement (interposition sleeve)

Middle: **LINK customized solution:** diaphyseal partial replacement with sleeve coupling for hip and knee prosthesis stems, comprising a proximal and a distal component, each with nine stem securing screws and two coupling locking screws, including two plastic stoppers

Right: **Postoperative:** diaphyseal partial replacement with sleeve coupling for hip and knee stem in situ