MyImplant
PATIENT ANATOMY RESOLVED

Medacta International

REVISION THA WITH HUGE ACETABULAR DEFECT TREATED WITH CUSTOM-MADE ACETABULAR IMPLANT

Mr. Rehan Gul
South Infirmary Victoria University Hospital, Cork (IR)

1 - PREOPERATIVE DATA

PATIENT HISTORY

- 61-year-old female
- Revision hip surgery in 2013 for aseptic loosening of a left hip implant with a significant cavitary defect. Reconstruction was performed using Trabecular metal (TM) augments and TM Shell.
- The cemented femur was revised using extended trochanteric osteotomy and Wagner-type modular stem.
- Presentation to the hospital in 2024 with a discharging sinus through the thigh.
- Diagnosed with Periprosthetic Joint Infection (PJI) of the left hip, in situ implants were revised with a two-stage revision surgery.

ACETABULAR DATA

- Severe acetabular bone loss occurred, consistent with Paprosky Type 3B classification.
- Presence of a large, complex bone defect with extensive soft tissue disruption.

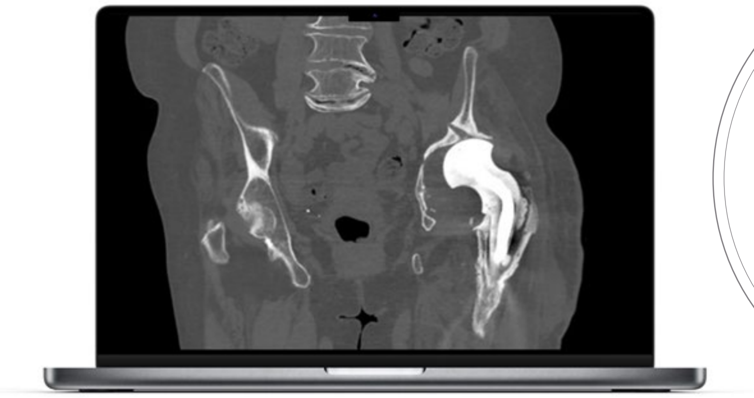

Fig. 1 Preoperative CT image, frontal view

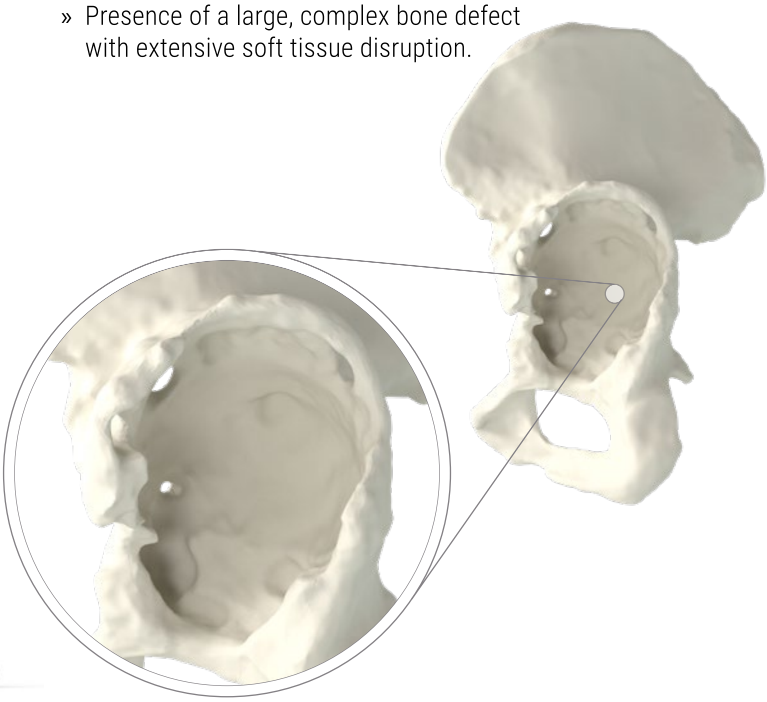

Fig. 2 Pelvic 3D reconstruction

2 - PREOPERATIVE PLANNING

- Manual segmentation of the CT images was performed to generate a 3D bilateral reconstruction of the pelvis and femur.
- A custom-made 3D-printed two-flange implant was designed, specifically engineered to restore the acetabular defect.
- The planned postoperative orientation includes an acetabular inclination of 45° and anteversion of 20°.
- The custom-made implant position was carefully planned to minimize bone resection and try to maximize surface contact, aiming to achieve satisfactory implant integration.
- Implant positioning was defined to restore the center of rotation relative to the contralateral side, achieving a medialization of 7.0 mm with no leg length discrepancy. This configuration helps achieve a reliable restoration of the joint biomechanics and provides a suitable range of motion for the patient.
- On the femoral side, a Medacta M-Vizion modular stem has been planned, coupled with a ceramic head and a HIGHGROSS UHMWPE flat liner, compatible with the custom-made implant.

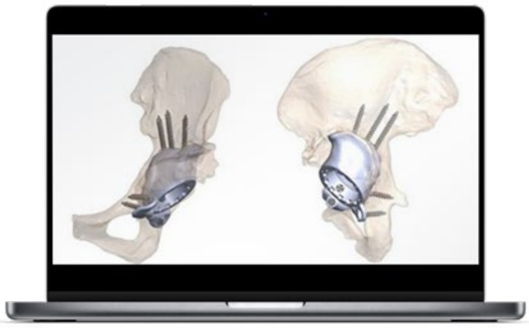

Fig. 3 3D preoperative planning

Medacta International SA | Strada Regina - 6874 Castel San Pietro - Switzerland
Phone +41 91 696 60 60 | Fax +41 91 696 60 66 | info@medacta.ch
99MYIMPHCASEREP_1 REV. GUL00

MyImplant
PATIENT ANATOMY RESOLVED

Medacta International

REVISION THA WITH HUGE ACETABULAR DEFECT TREATED WITH CUSTOM-MADE ACETABULAR IMPLANT

Mr. Rehan Gul
South Infirmary Victoria University Hospital, Cork (IR)

3 - SOLUTION

IMPLANT DESIGN

» The custom-made implant is produced in 3D Metal, an advanced biomaterial structure obtained using the 3D Metal technology, our in-house additive manufacturing process. The result is a porous outer surface engineered to replicate the natural properties of bone. This structure provides intrinsic high friction and scratch-fit with the surrounding bone, contributing to maximized primary stability[1].

» The 3D printed back surface of the custom-made implant is tailored to fill the acetabular defects, caused by previous aseptic loosening and the recent PJI.

» Seven screw holes are strategically planned to accommodate Compression Polyaxial Locking Screws (CPLS). Both the screw orientation and length are carefully designed to maximize bone purchase and try to achieve satisfactory implant fixation.

INSTRUMENT DESIGN

To facilitate bone preparation and implant positioning, the following custom-made instruments are provided:

» Reamed bone model with removable osteophytes: used intraoperatively to assists in identifying the amount of bone to be removed and to help achieve correct bone preparation.

» Trial implant: enables verification of the bone bed preparation before final implant placement.

» Patient-specific drilling guides: ensure accurate drilling of screw holes in the preplanned directions and depths, enabling optimized screw placement.

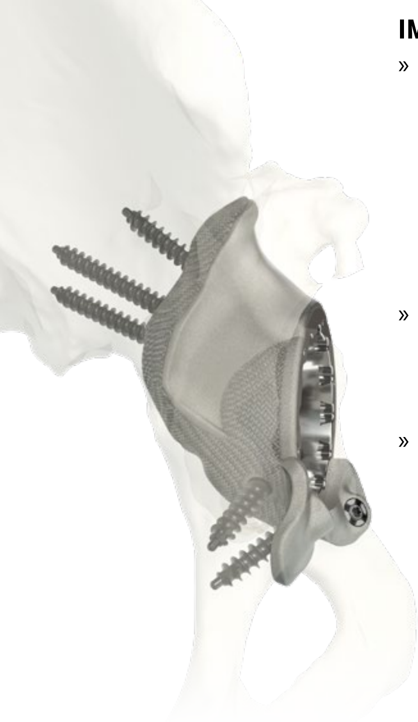

Fig. 4 Patient-specific acetabular implant 3D model

Fig. 5 Patient-specific acetabular implant

Fig. 6 Patient-specific drilling guide

4 - RESULTS

The surgery resulted in excellent filling of the acetabular bone defect and positive correction of the bone deformity, restoring the proper joint centre of rotation and range of motion. The patient-specific guides facilitated precise and safe screw placement, contributing to optimal implant fixation.

The patient's previous extended osteotomy was fully healed, and an M-Vizion modular stem (Distal Component Ø16mm and Length 140mm, Proximal Component Ø24mm Lateralized and Length 60mm) was used to reconstruct the femur.

By combining the custom-made acetabular implant with standard Medacta components, a fully cementless Medacta construct was successfully achieved.

Postoperatively, the patient showed significant improvement in range of motion and experienced notable pain relief.

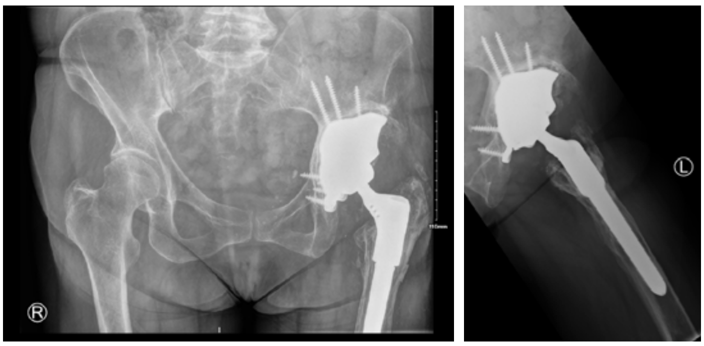

Fig. 7 1-year postoperative x-rays

> *It was a great experience working with the Medacta engineering team and our local team in Ireland to achieve these results for the patient. The design was simple and fit very well. I like the idea of suggesting where to remove bone and using reamers to improve the fit.*
>
> **Mr. Rehan Gul**

DISCOVER MORE ABOUT MYIMPLANT

1 - www.medacta.com/EN/3d-metal