THE PURPLE SPARK

3D PLANNING & PRINTING CASE FILE

PRIVATE & CONFIDENTIAL: ONLY FOR PATIENT'S USE

NOT TO BE CIRCULATED

PATIENT'S NAME - [redacted]

AGE & GENDER - 53 YEARS, MALE

CASE ID - 2405003

DIAGNOSIS - LEFT PELVIS SYNOVIAL SARCOMA

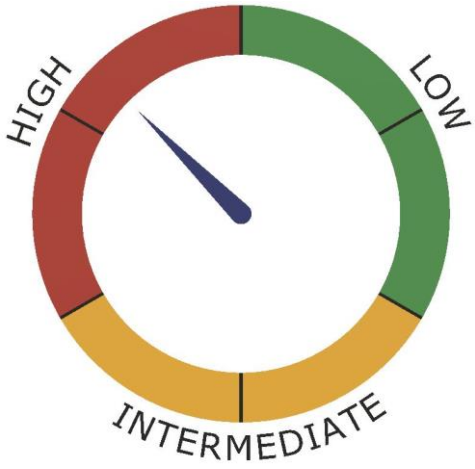
DOCTOR- DR. PRAMOD S CHINDER

ANALYTICS

No. of Hours	Plan Discussion	Segmentation	Design & Development	3D Printing (models, jigs, guides)	**Cumulative Hours**
3D Process Engineer	16	11.5	68	172	**≈268**

No. of Hours	Image Correlation	Plan Discussion	Implant Fusion & Finalization	Dry-Run (Mock Surgery with 3DP models)	Approximate Surgery Hours	**Cumulative Hours**
Clinician	2	16	31	1.5	10	**≈61**

CASE DIFFICULTY & COMPLICATION LEVEL



Signature

Design Engineer-Medical

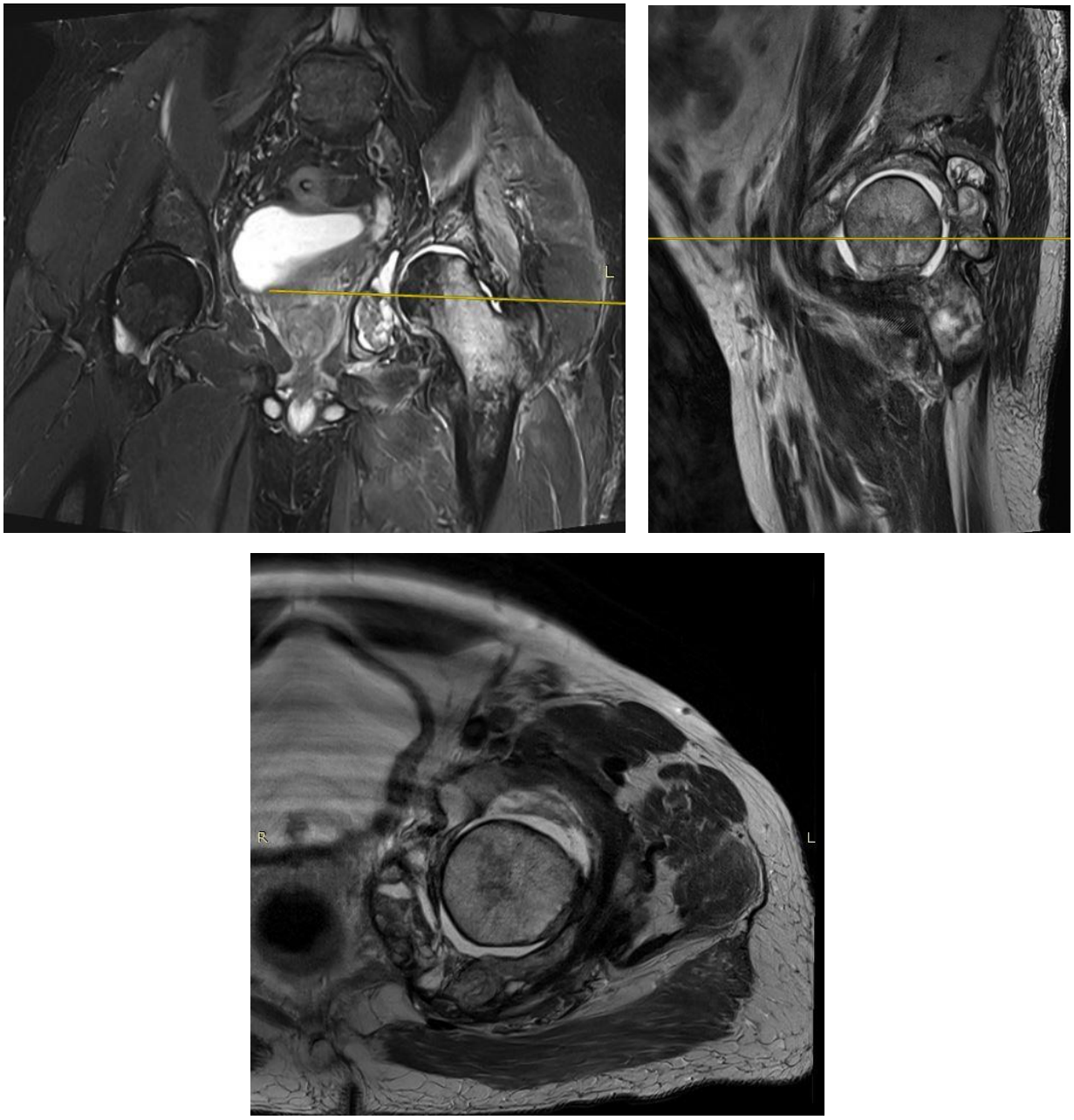
The Yellow Ribbon

Signature

Clinician In-charge

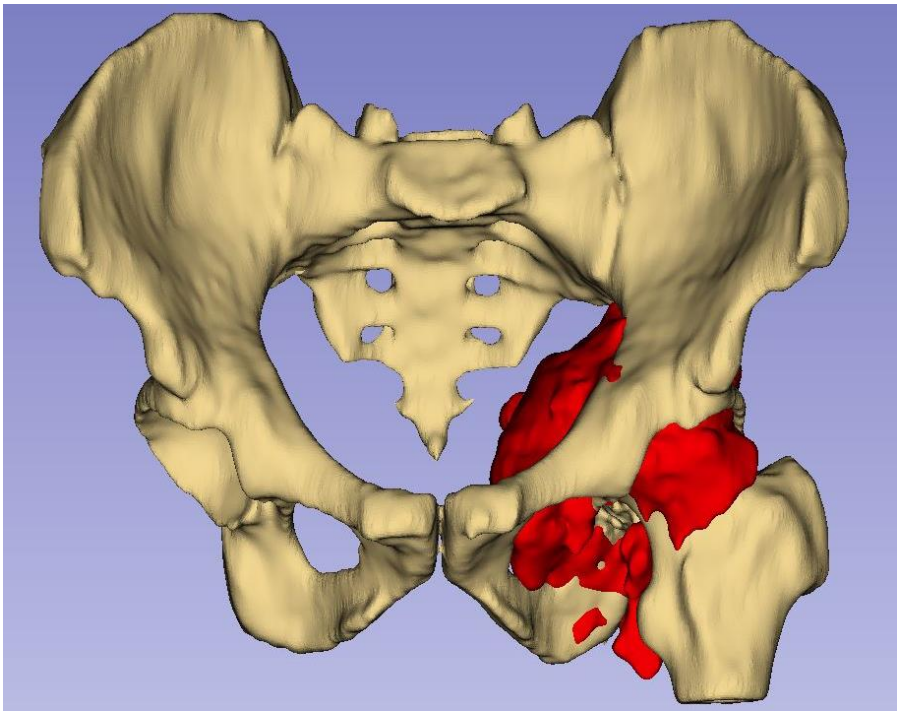
The Yellow Ribbon

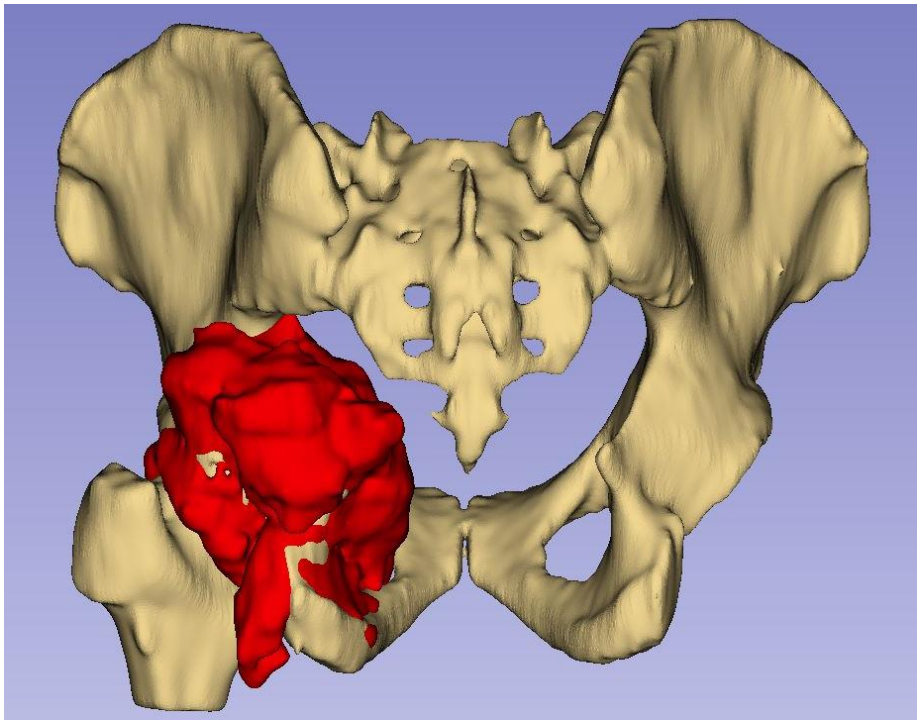
MRI IMAGES



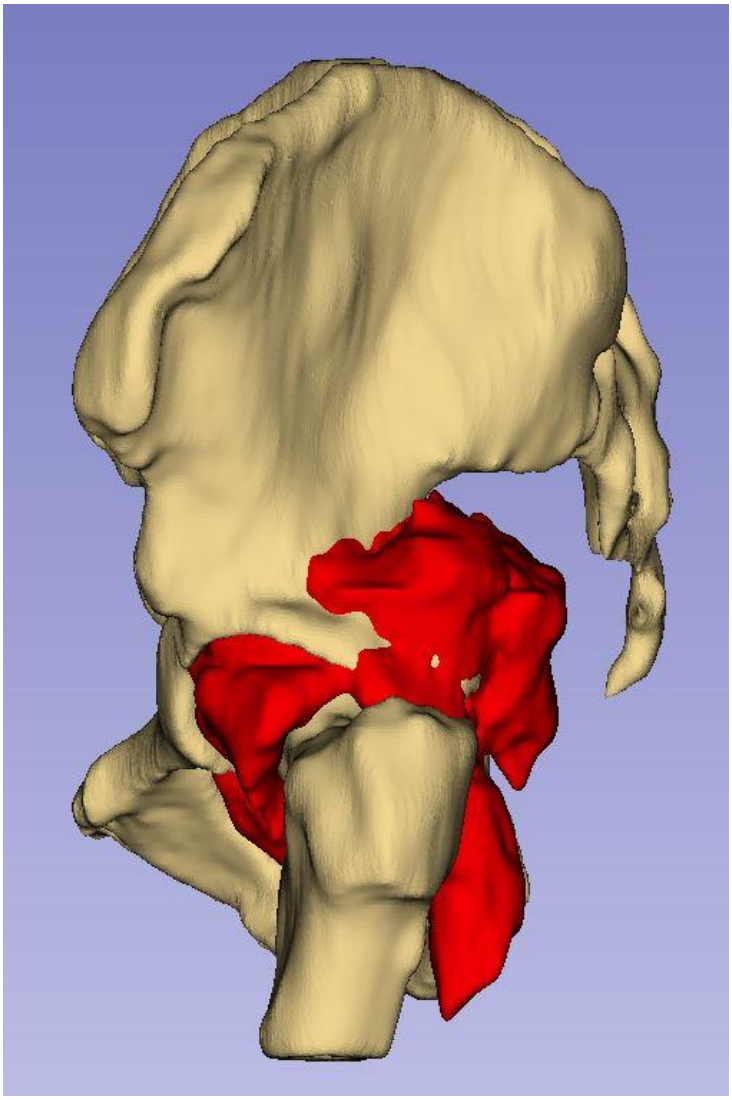
Coronal, sagittal, and axial MRI images

SEGMENTED MODEL





Anterior and posterior views of segmented model



Lateral view of segmented model

PLAN

1. RESECTION:

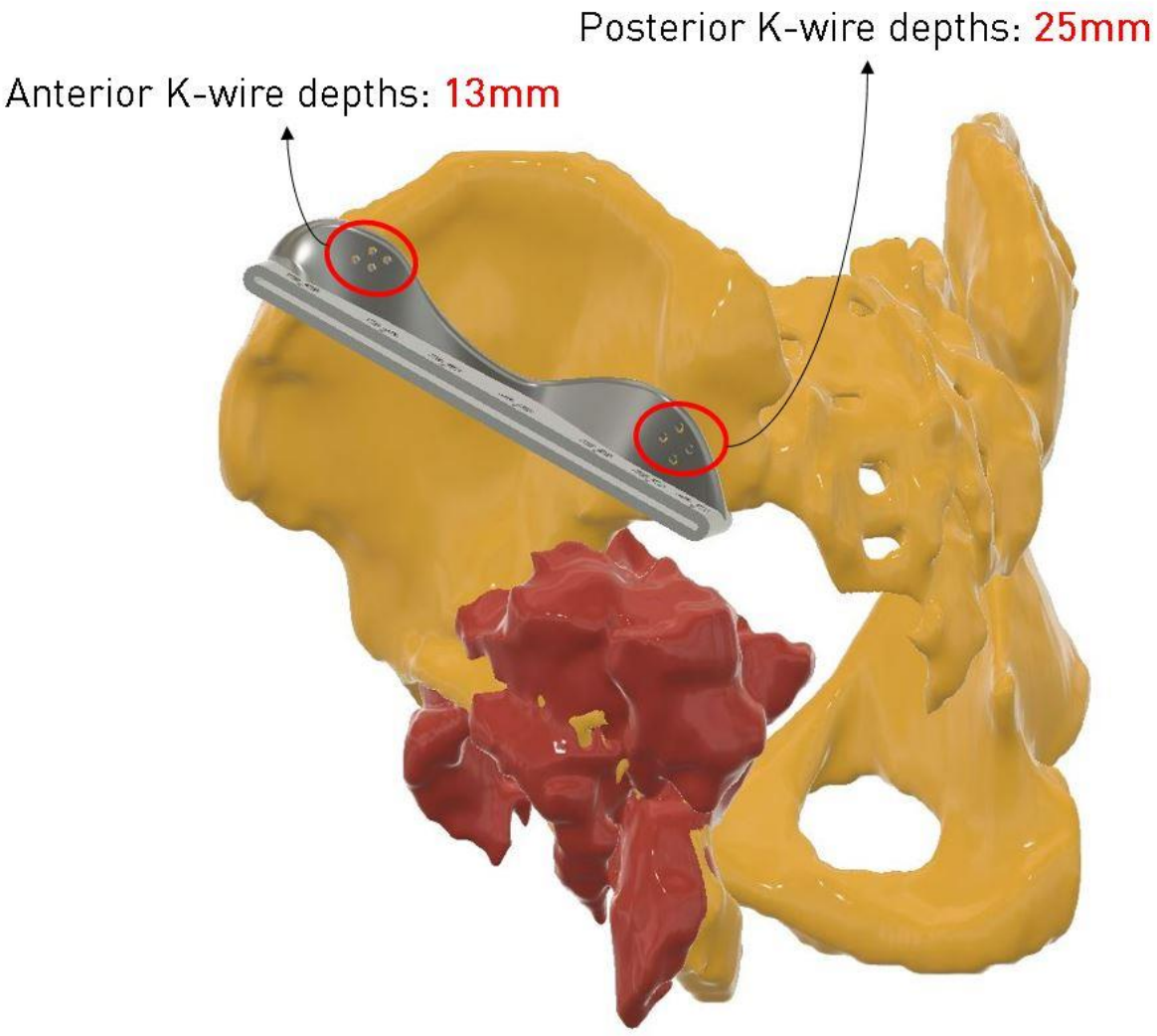
   1.1 En-bloc resection of the tumor mass with involved iliac bone.

   1.2 Symphysis cut

   1.3 Iliac osteotomy using custom resection jig (R1)

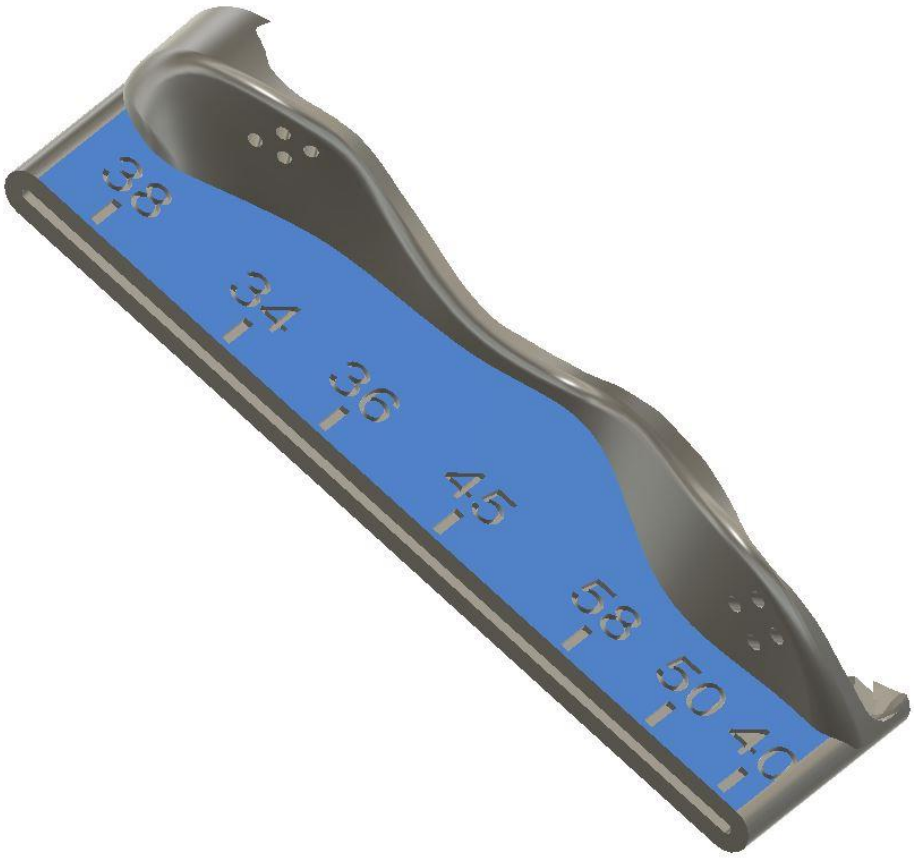
   1.4 Resection jig fitment:

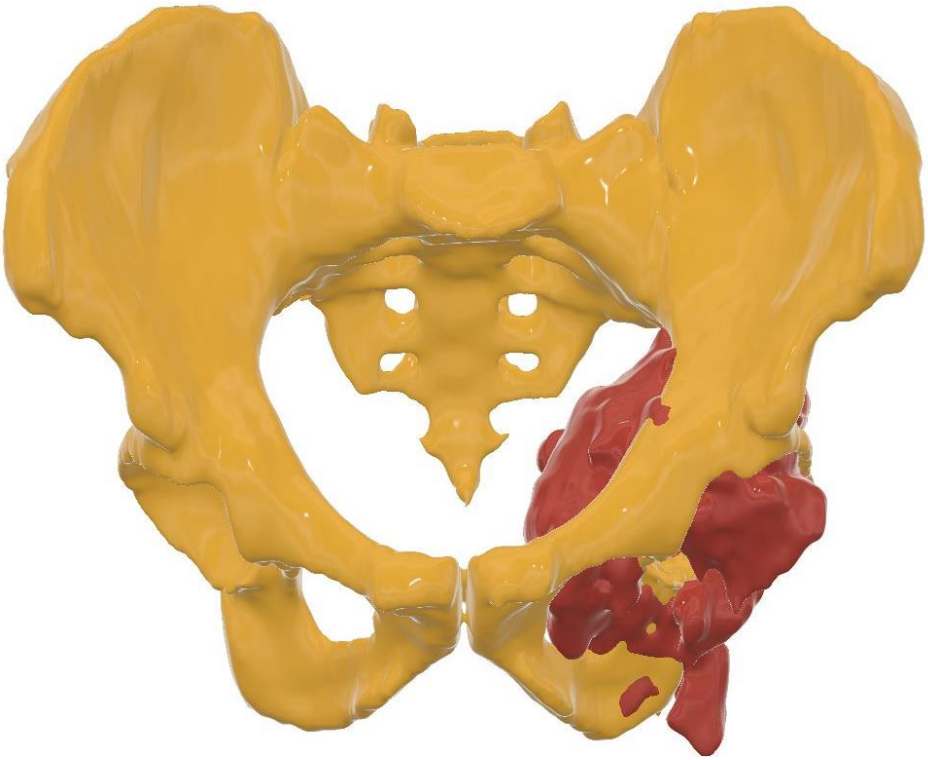
   - K-wires: 1.5mm diameter
   - Anterior K-wire hole depths: upto 13mm
   - Posterior K-wire hole depths: upto 25mm



1.5 Iliac osteotomy:

- Resection margin: 20mm
- Cutting depths mentioned on the jig across its length





PRE-
OSTEOTOMY

POST-
OSTEOTOMY

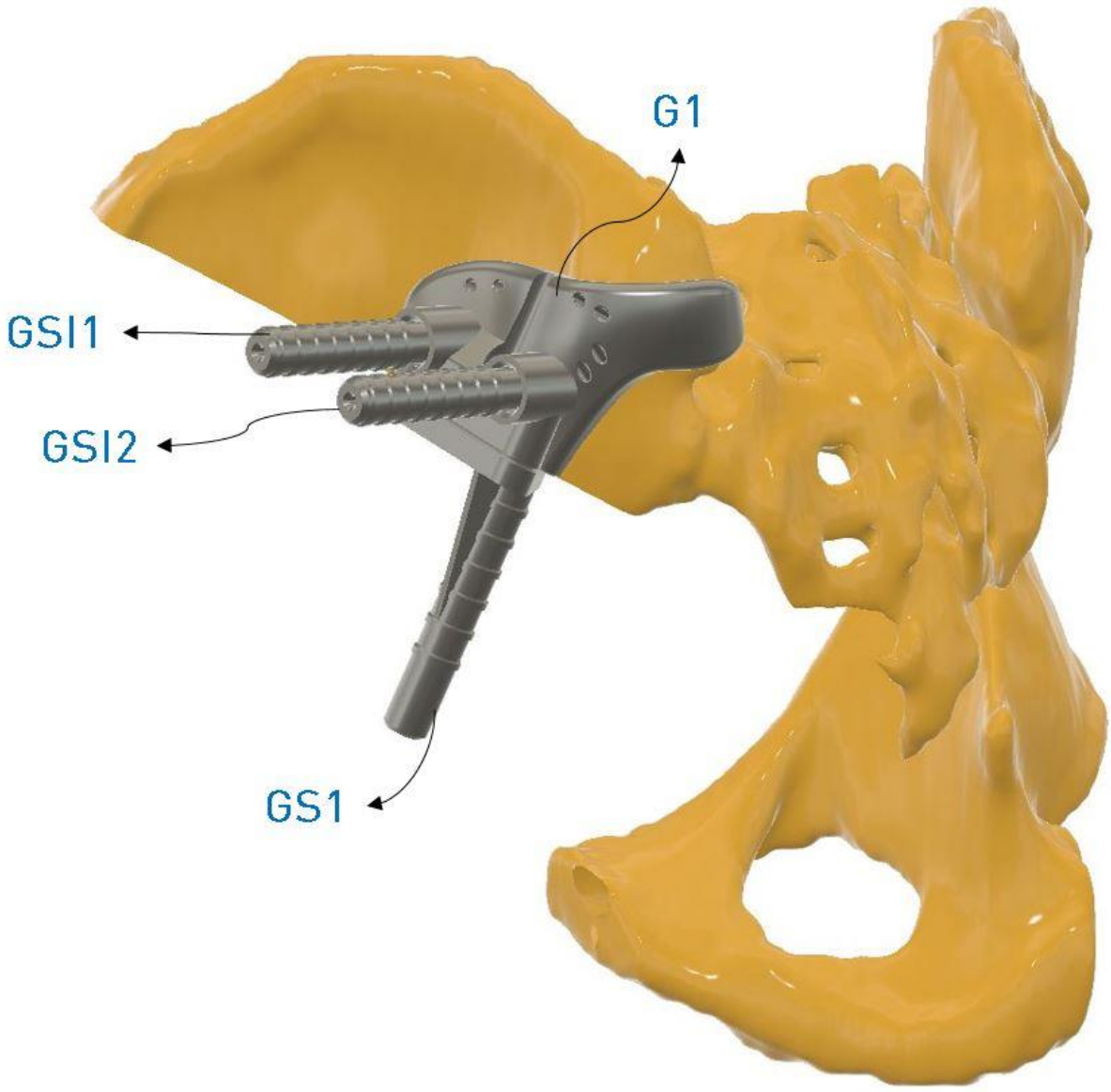
2. RECONSTRUCTION:

- Using custom 3D printed Titanium hip implant, stub and screws

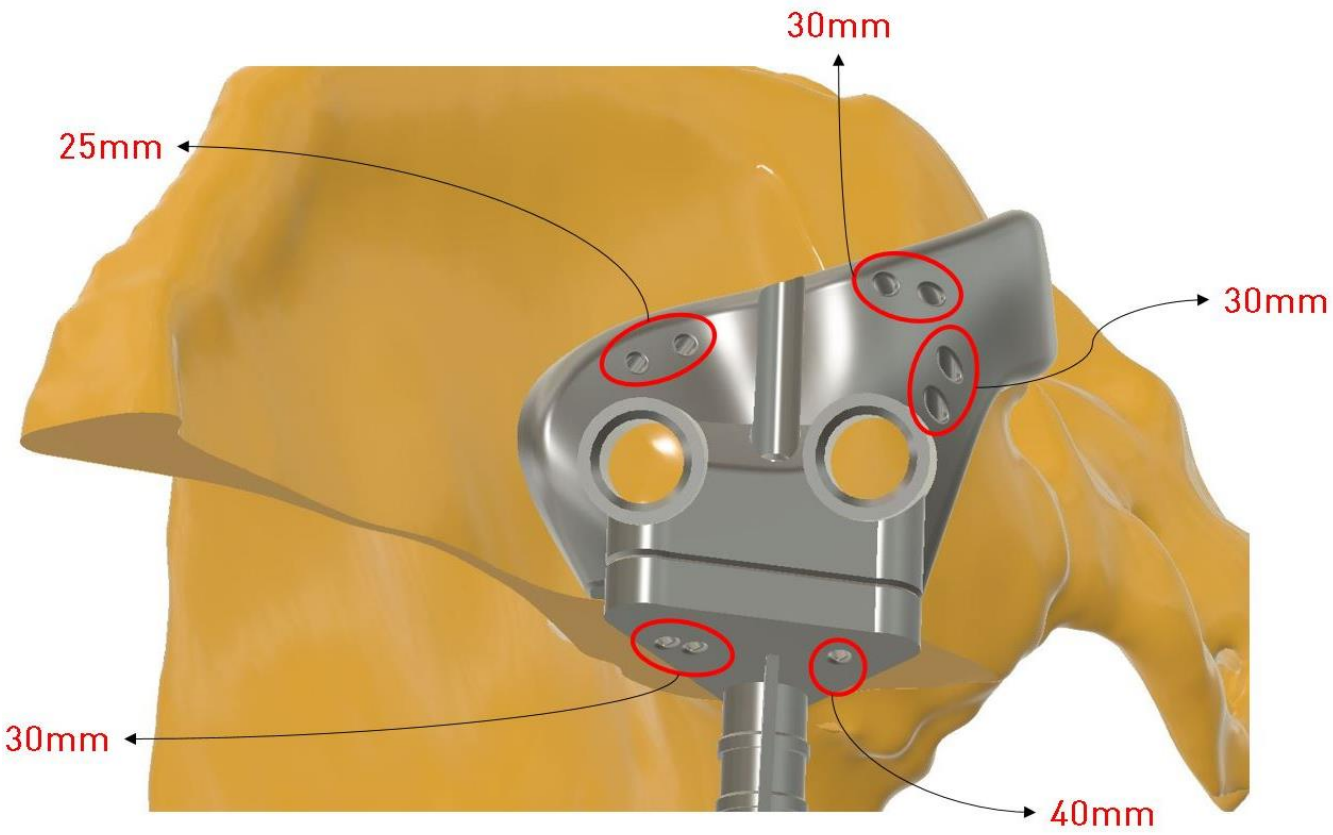
- Trajectory of the screws and stub determined by custom 3D printed jigs

2.1 Fitment of guide wire jig assembly, onto the resected bone:

(G1 + GS1 + GSI1 + GSI2)



Securing guide wire jig assembly into position with k-wires:



2.2 Guide wires insertion into iliac & sacro-iliac sections:

S1 hole guide wire:

- Guide wire diameter: 1.8mm
- Guide wire drive depth (from GSI1 tunnel top): 210mm

S2 hole guide wire:

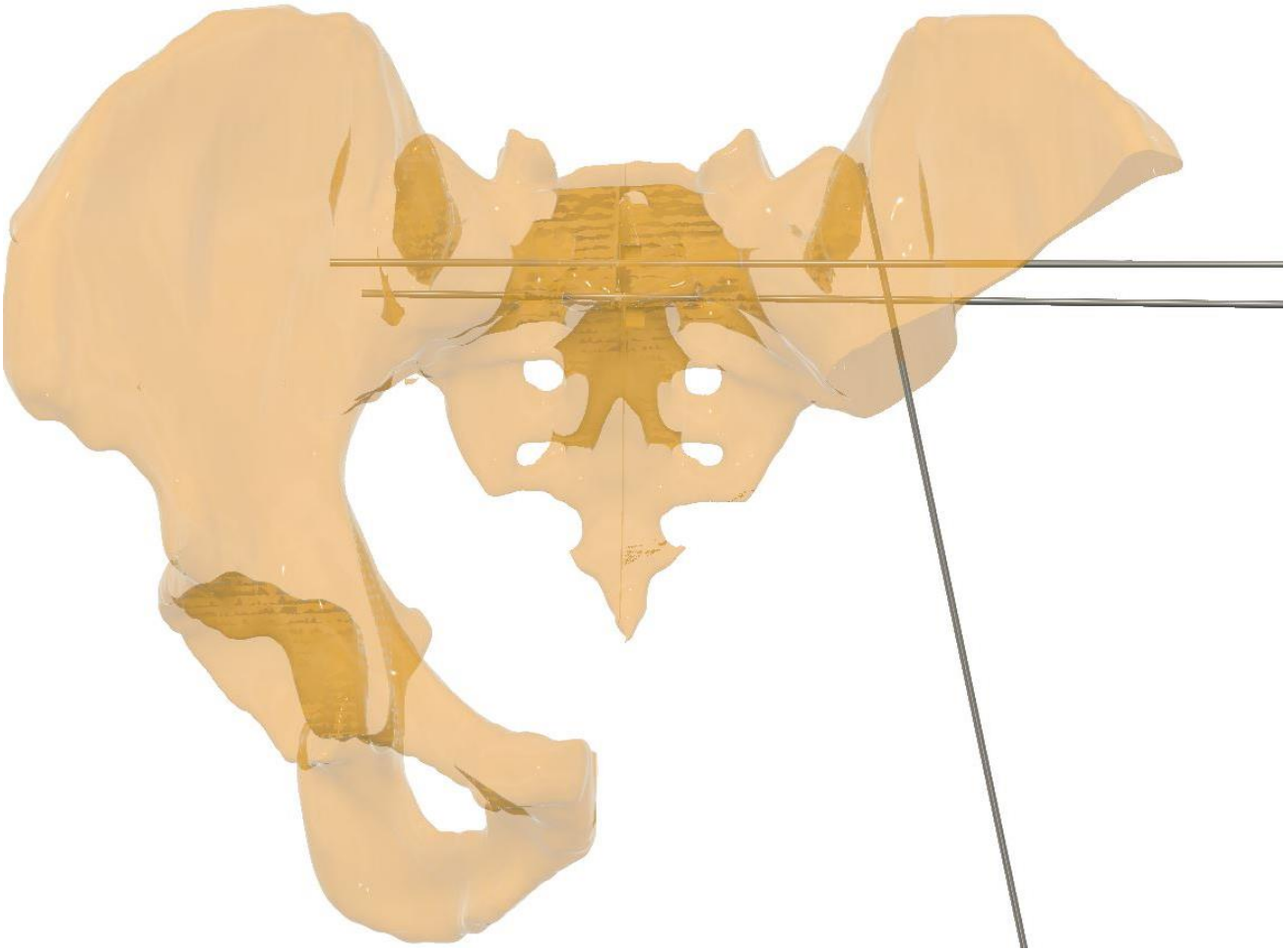
- Guide wire diameter: 1.8mm
- Guide wire drive depth (from GSI2 tunnel top): 200mm

Stub hole guide wire:

- Guide wire diameter: 1.8mm
- Guide wire drive depth (from GS1 tunnel top): 120mm

2.3 Guide wire jig dismantling and removal:

- Pull GS1 down & out
- Pull GSI1 & GSI2 out
- Remove the G1 laterally



2.4 S1 cannulated drilling:

- Cannulated drill bit size: upto 6mm (for 7mm cancellous screw)
- Cannulated drilling depth (from bone surface): 150mm

2.5 S2 cannulated drilling:

- Cannulated drill bit size: upto 5.5mm (for 6.5mm cancellous screw)
- Cannulated drilling depth (from bone surface): 140mm

2.6 Stub hole cannulated drilling & reaming:

- Cannulated reaming diameter: upto 7.5mm
- Cannulated reaming depth (from bone surface): 54mm
- Screws & Stub tracks made in bone; guide wires removed.

2.7 Implant placement:

- Position fixation of implant using K-wires (1.5mm diameter)
- S1 screw fixation: 4.5-Hex screw driver
- S2 screw fixation: 4.5-Hex screw driver
- Stub fixation: 4.5-Hex screw driver
- K-wires' removal
- Poly-axial screw fitment into posterior ilium:
  - Diameter: 5.5mm
  - Length: upto 25mm
- Connection of Iliac poly-axial screw with S1 poly-axial screw:

Posterior view of fixation & deficit reconstruction

Lateral view of fixation & deficit reconstruction

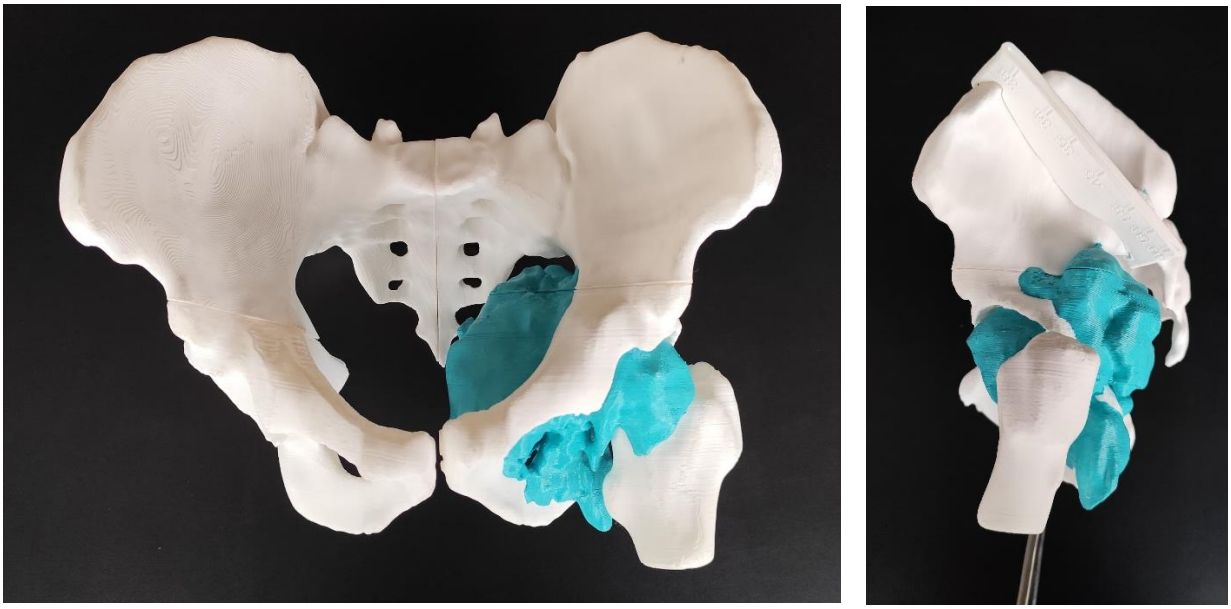
2.8 Morselized allograft packing:

- Between the implant's solid & lattice surfaces

2.9 Implant placement:

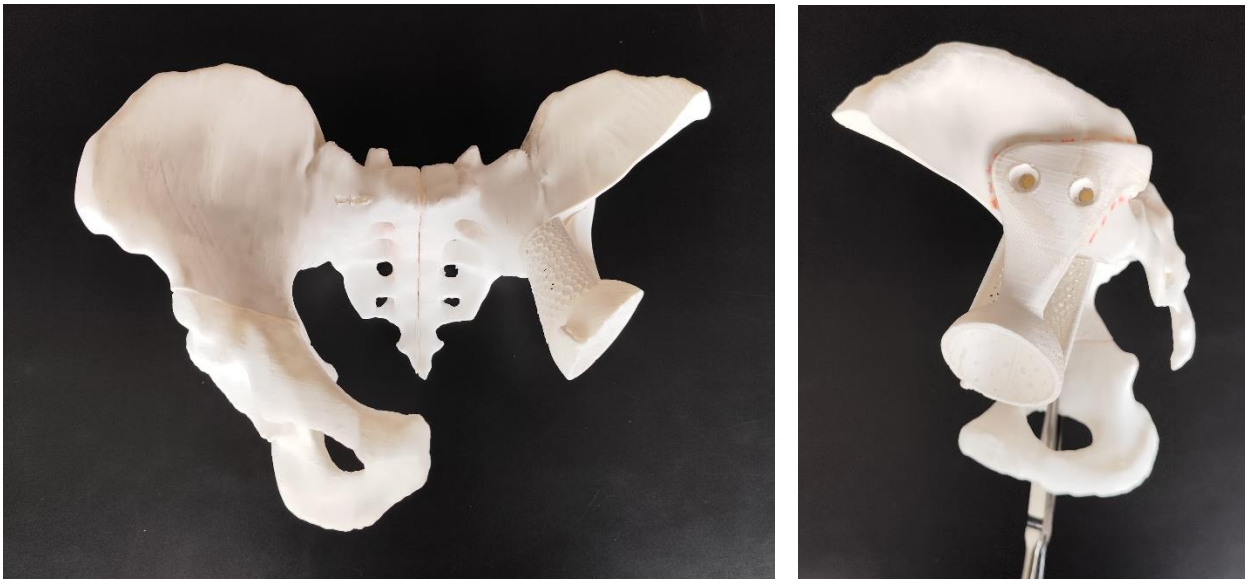
- Hip joint reconstruction
- Evolutis cemented dual mobility cup
- Shell size: 47 (H51 C047)
- Polyethylene liner size: 47-28 (H51 M2847)
- Femoral head size: 28

3D PRINTED MODELS



Anatomic model, & fitment of resection jig onto the bone

Fitment of guide wire jig assembly onto the resected bone



Fitment of dummy implant onto the resected bone surface

Custom 3D printed Titanium implant

Final 3D printed models, instruments, & implants for surgical utility