

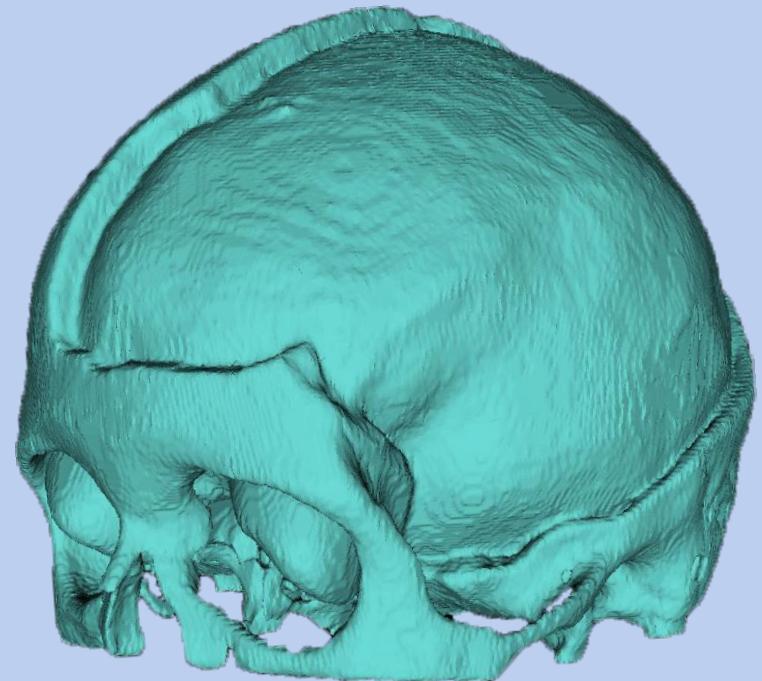
Patient Specific Implants for skull defects

Andreas Nowacki

Nicolas Gerber

Andreas Raabe

Direktor: Prof. Dr. Andreas Raabe
(Klinik für Neurochirurgie
Universität Bern)



Clinical Case Presentation

Clinical Case Presentation:

- 30 year old male patient
- Accident: severe head trauma, with acute subdural hematoma
- Indication for decompressive hemicraniectomy



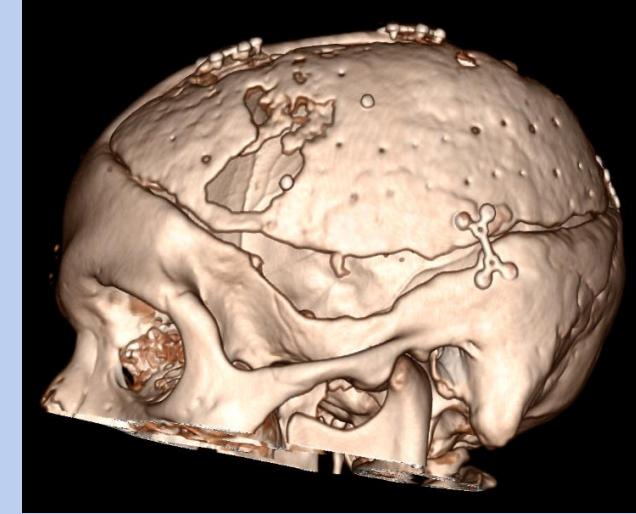
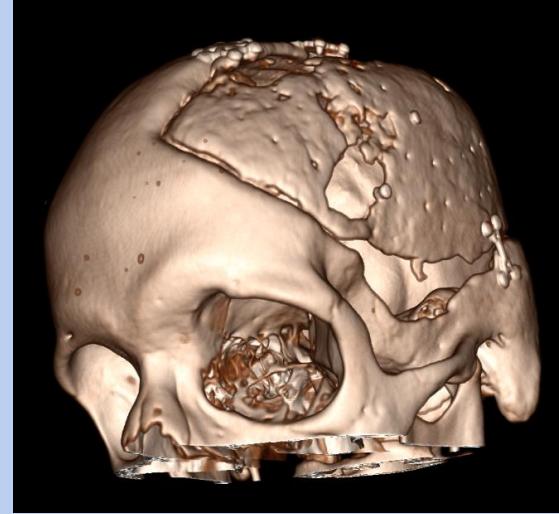
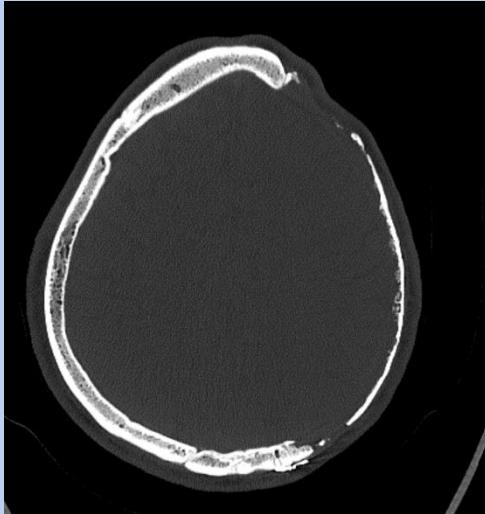
Clinical Case Presentation

- Postoperative after decompression good recovery of neurological function
- Reimplantation of his own (autologous) bone flap after 6 weeks



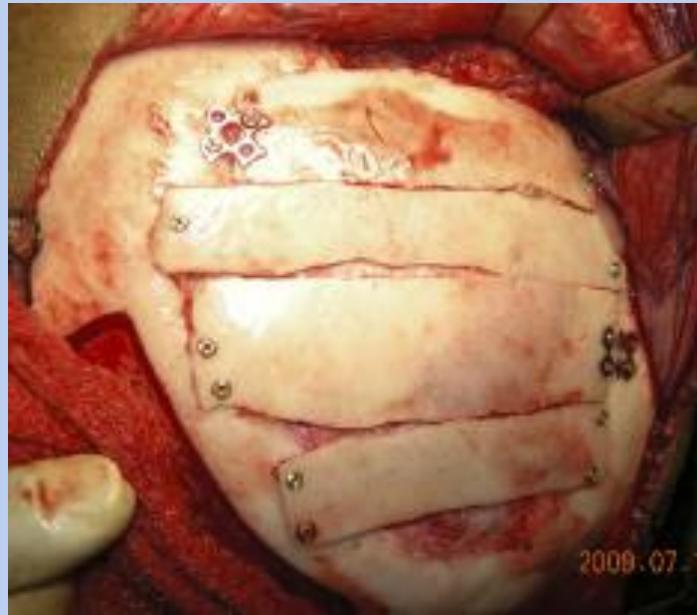
Clinical Case Presentation

Postoperative follow-up CT-scan revealing osteolysis:



-> Indication for Patient Specific Artificial Bone implant

Background



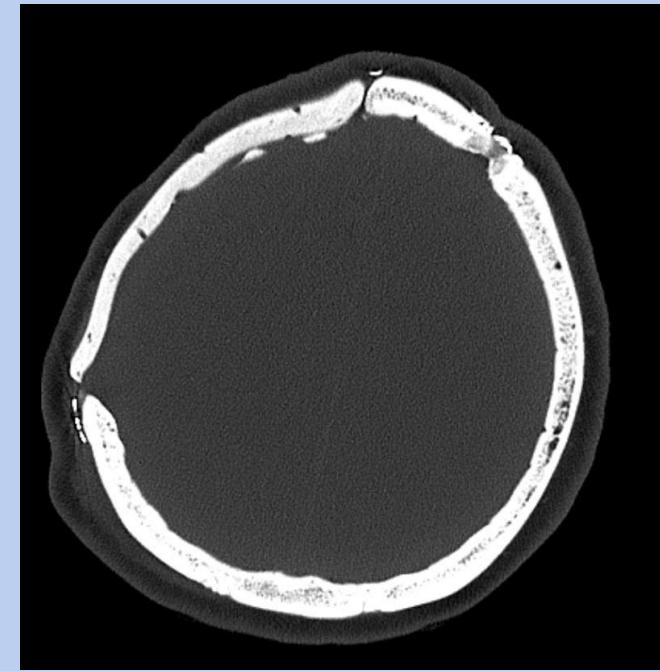
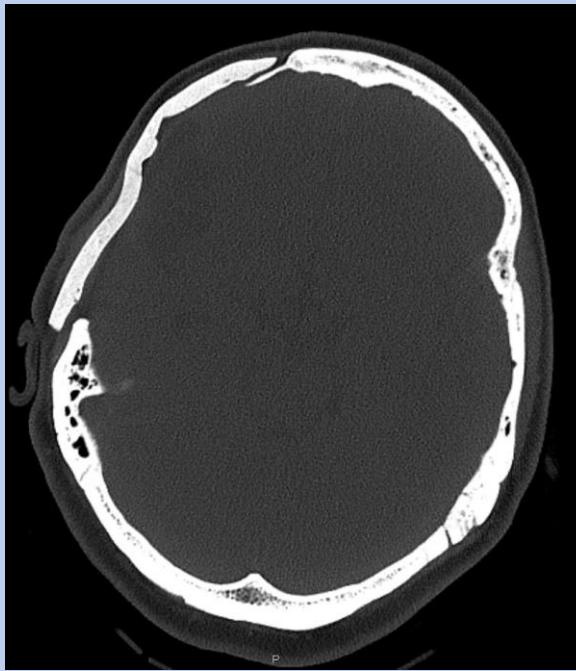
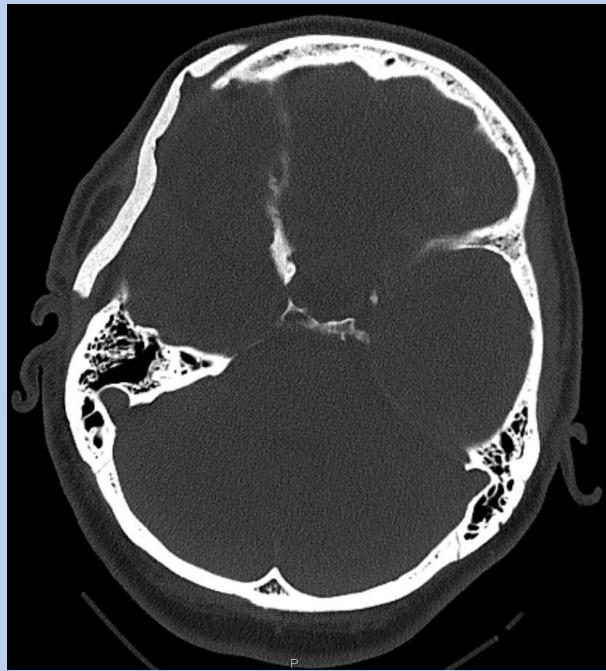
Sahoo et al. 2010



Marchac et al. 2007

Background

Postoperative CT-scan of a “**freehand**”-made artificial bone implant from Palacos®



Background

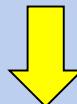


Patient Specific Moulded Implants

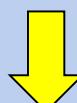
CT-scan of Patient's head



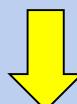
Medical Image processing Software
(e.g. iPlan 3.0 Brainlab®)



3D model of PSI-mould

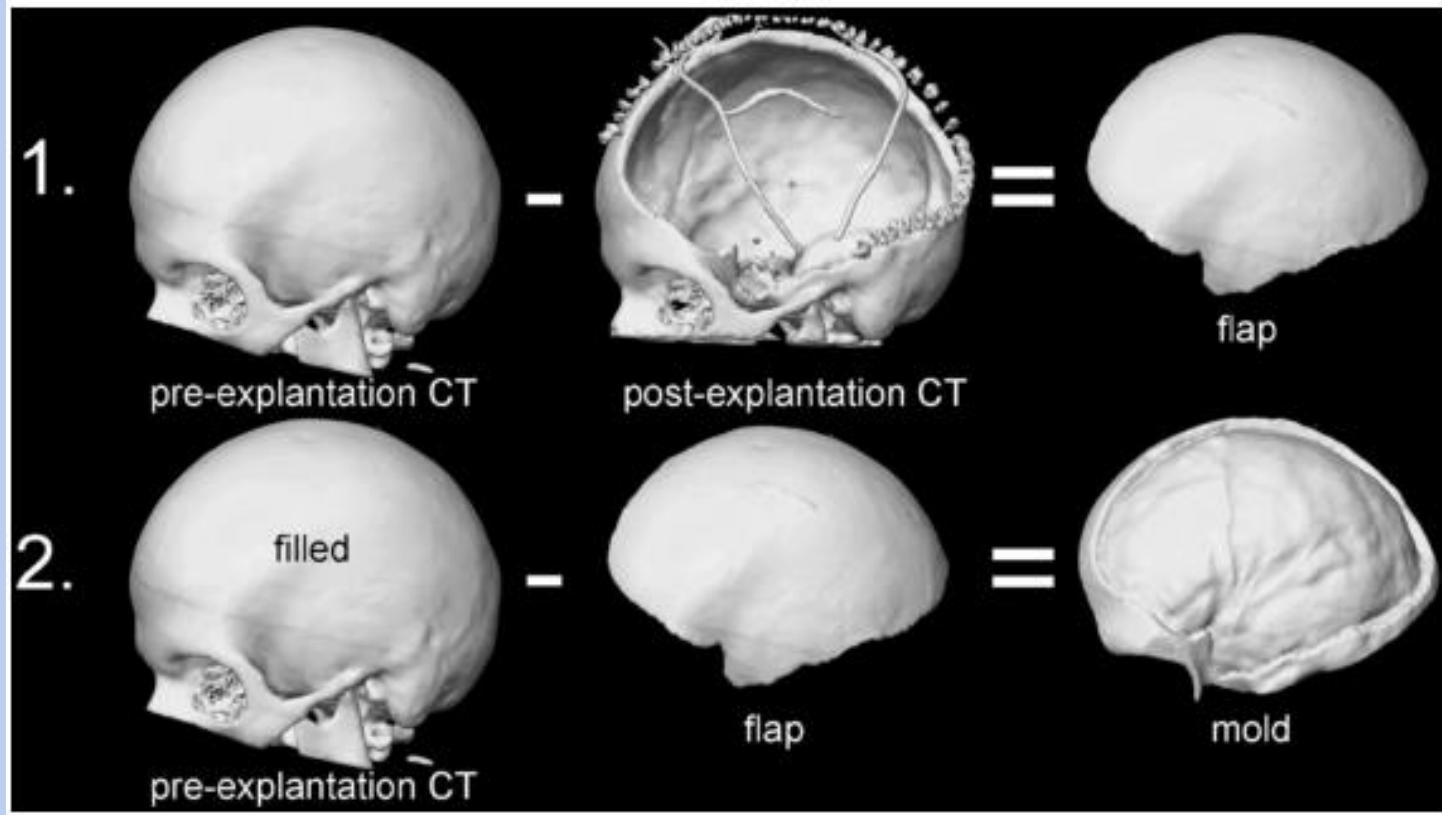


3D Printing of PSI-mould



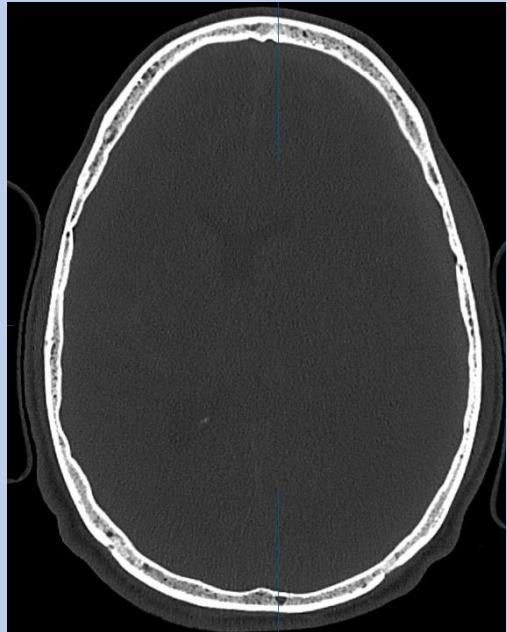
Intraoperative fabrication of PSI

Patient Specific Implants (PSI)

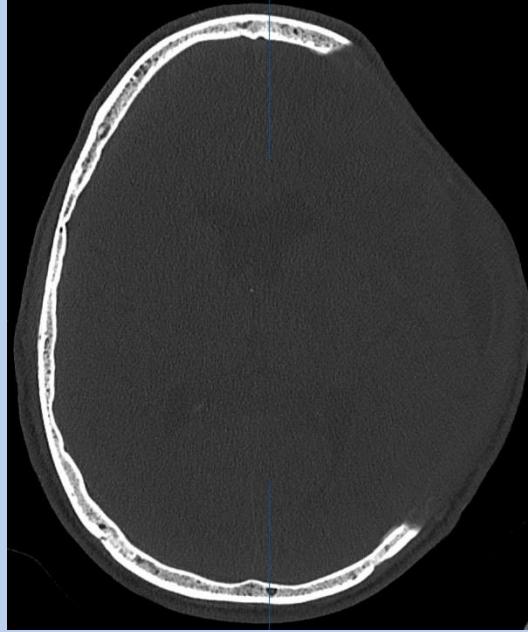


From: Stieglitz et al. Acta Neurochir. 2013

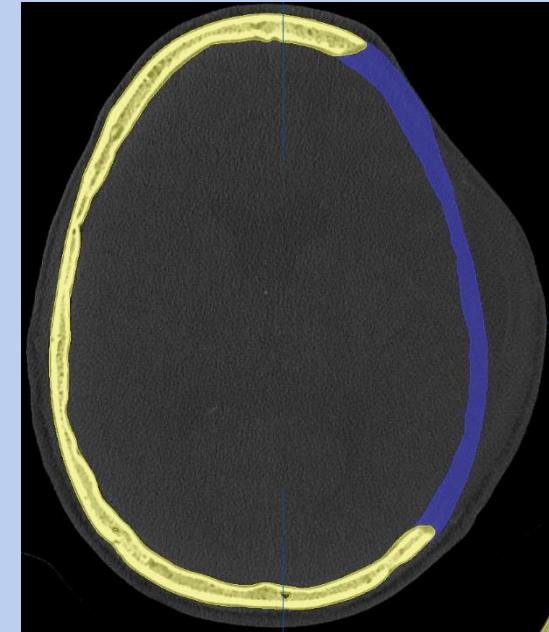
PSI-Mould Design



intact bone

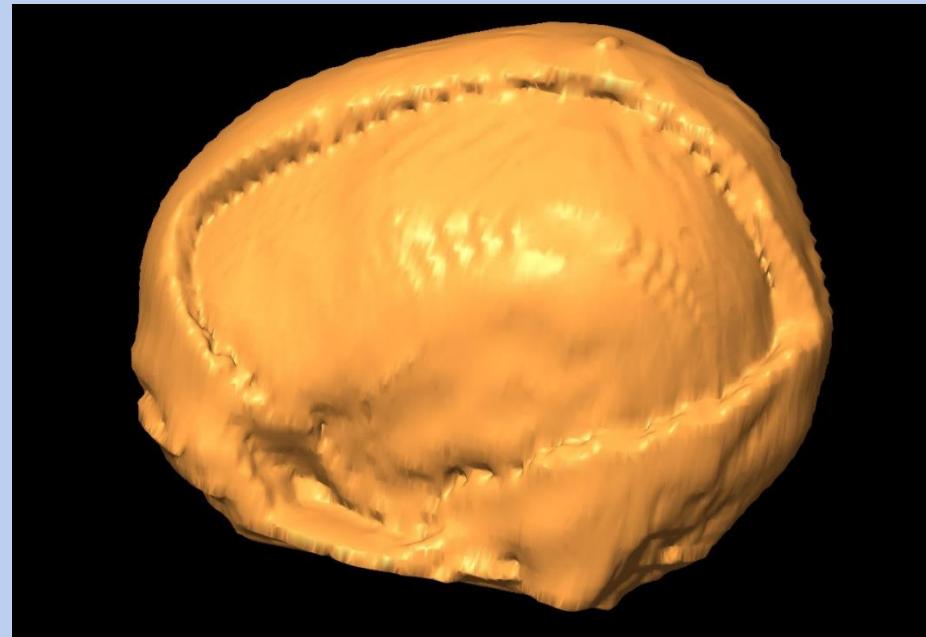


defect bone



Fused and subtracted CT:
Bone flap model

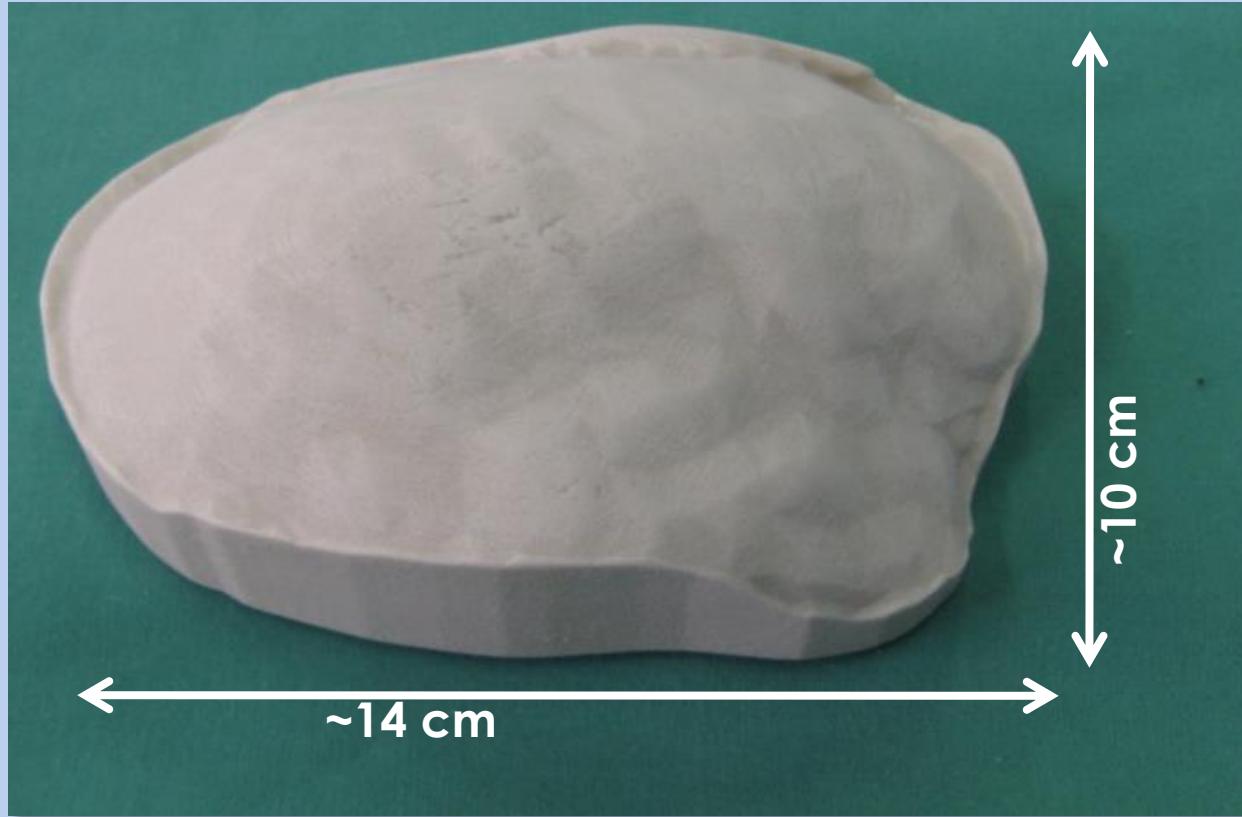
PSI-Mould Design



Mould model

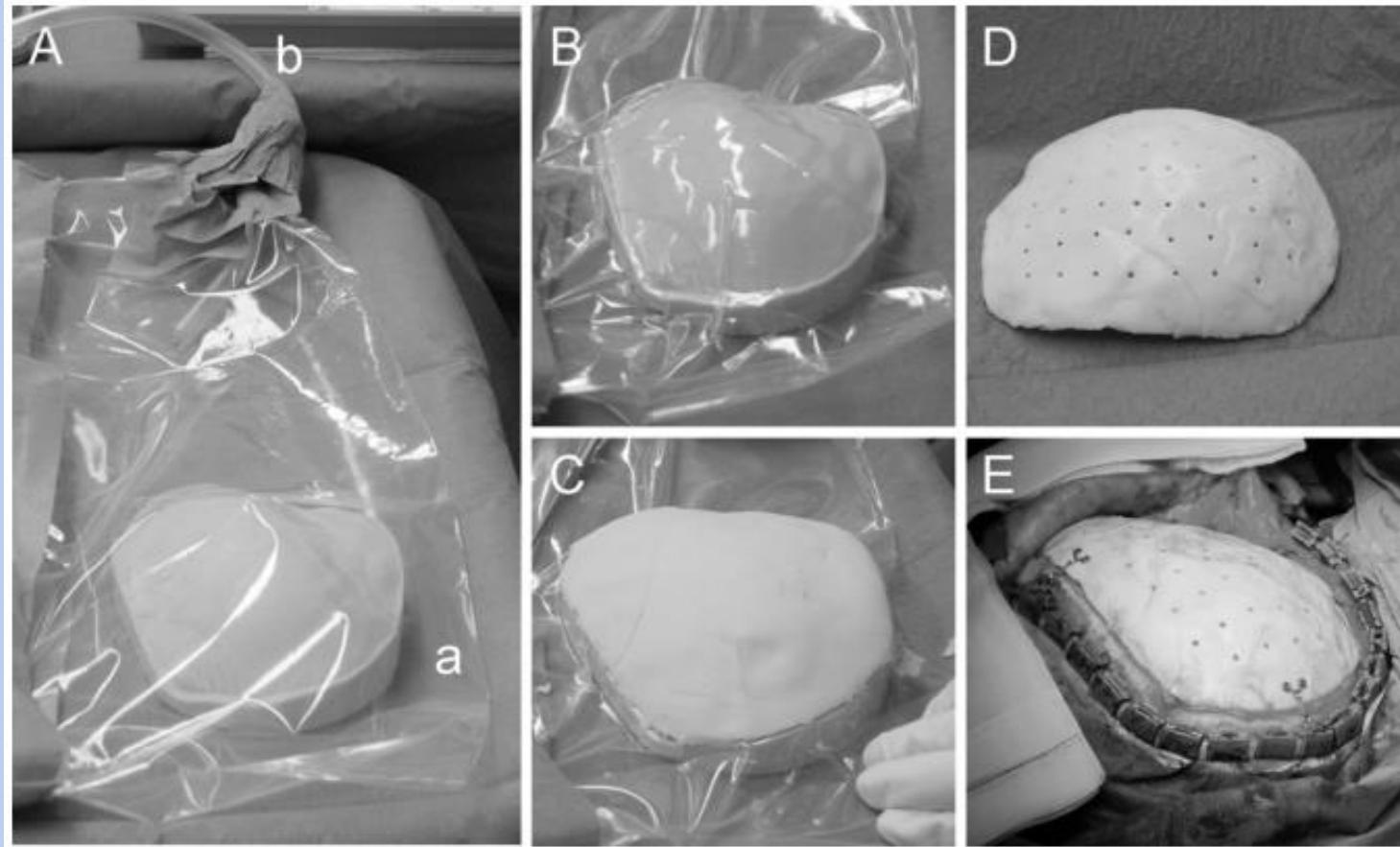
3D-Mould model

PSI-Mould Design



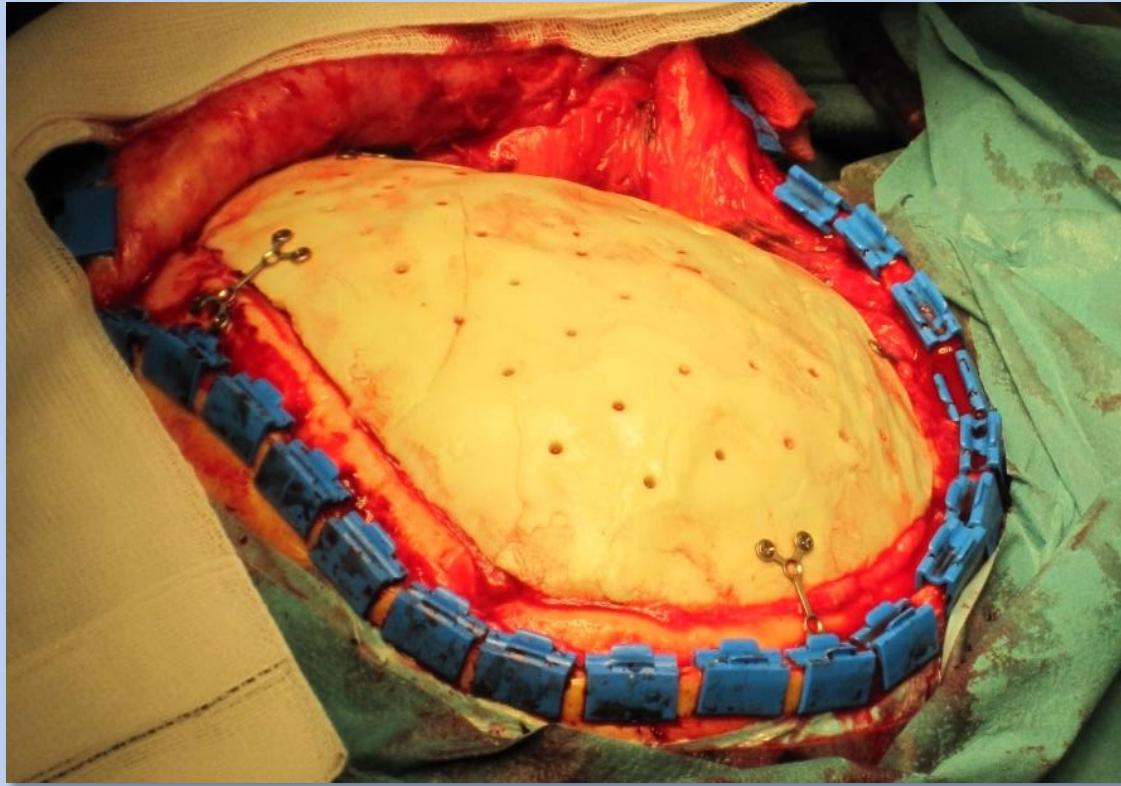
Mould

Intraoperative PSI-fabrication



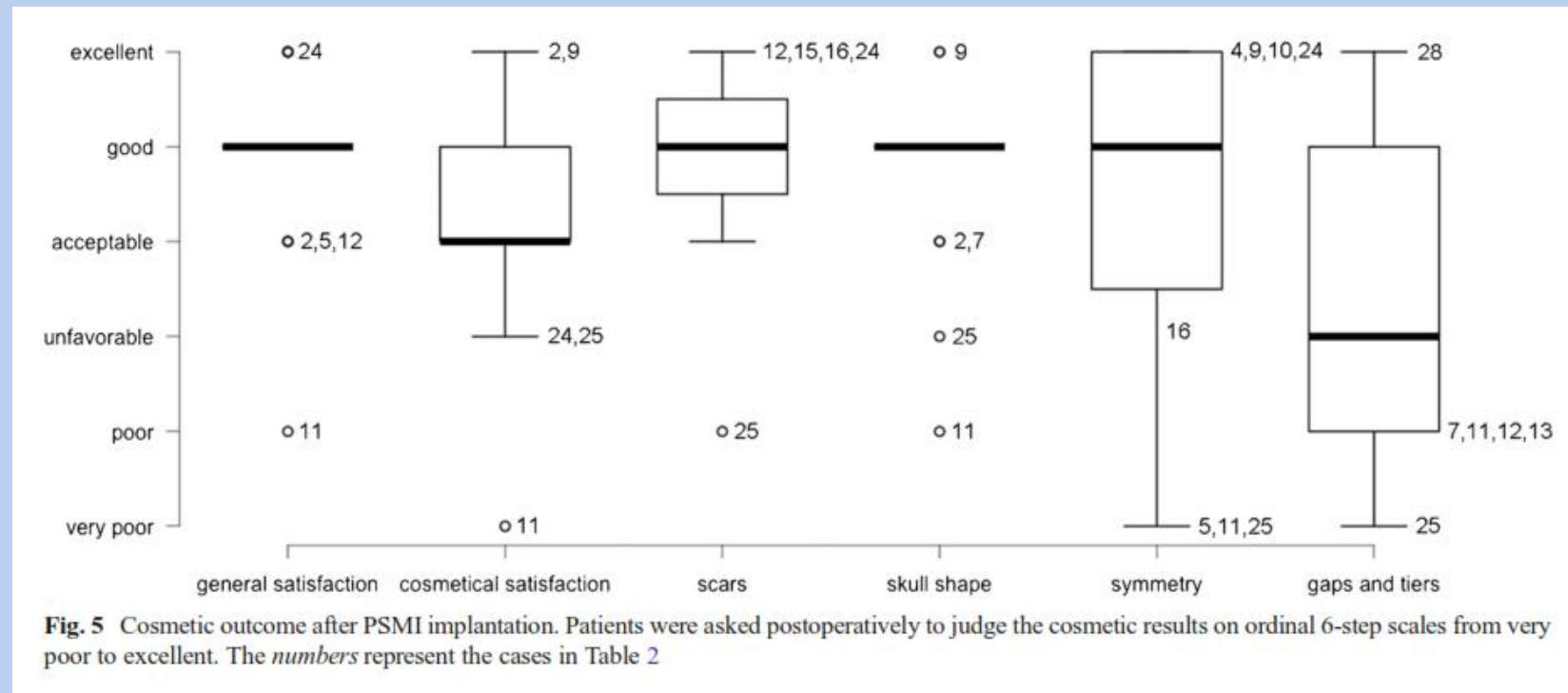
From: Stieglitz et al. Acta Neurochir. 2013

Intraoperative PSI-fabrication



From: Stieglitz et al. Acta Neurochir. 2013

Postoperative Results



From: Stieglitz et al. Acta Neurochir. 2013

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Thank you



Bern, Switzerland