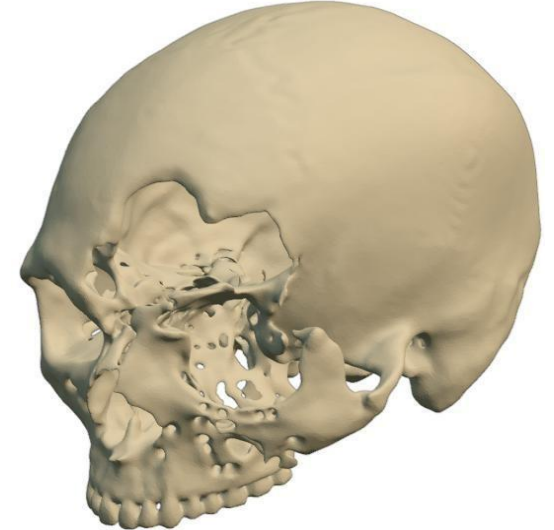
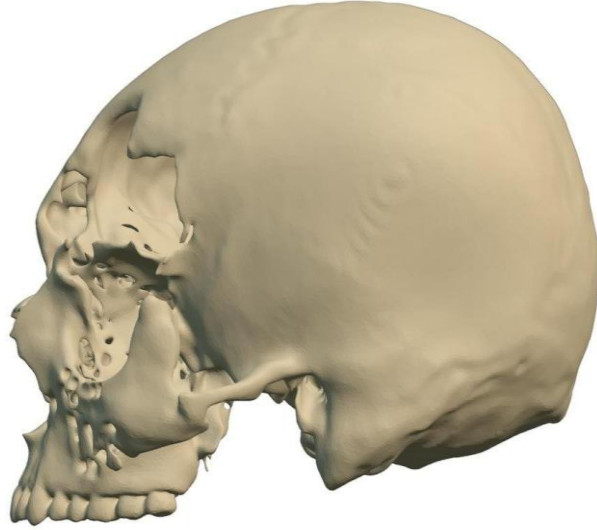


Craniotomy With Frontal Bone Defect



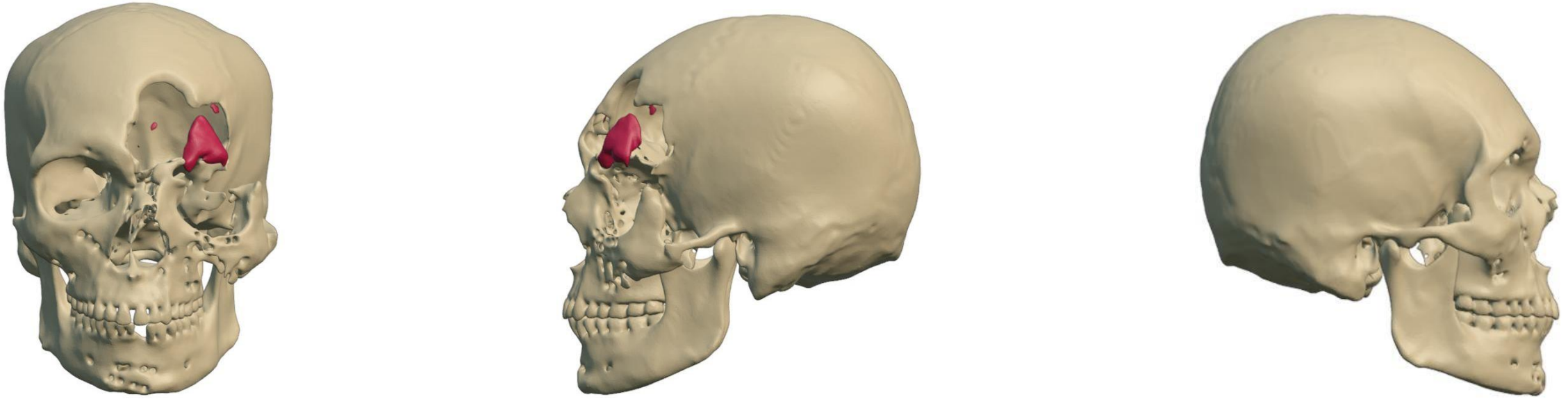
Supraorbital Implant

About case



- A 30-year-old male, presented with a previously operated head injury and a frontal bone defect. Detailed clinical and radiological evaluation confirmed a significant frontal cranial defect requiring reconstruction.
- To enable precise pre-operative planning and anatomical restoration, the case was assessed using advanced 3D imaging, and a patient-specific 3D model and customized implant were planned for surgical management.

Clinical challenges



- The patient had a large frontal bone defect with associated orbital, zygomatic, and nasal deformities from previous trauma and surgery. Altered anatomy and distorted landmarks made precise reconstruction challenging.
- Malalignment of the left zygomatic arch, zygomaticomaxillary buttress, and nasal bones, resulting in facial asymmetry. Revision surgery was required to mobilize, reposition, and stabilize these structures to restore normal facial projection
- Prior surgeries resulted in scarred soft tissues and altered tissue planes. Ensuring adequate implant coverage while maintaining tissue viability was essential for successful healing and implant stability.

Precision Through Case Planning



- A 3D patient-specific implant (PSI) was designed to reconstruct the frontal bone defect and restore craniofacial symmetry. The customized implant enabled precise reconstruction and facilitated surgical planning.
- The custom implant was engineered to achieve an exact anatomical fit, matching the patient's frontal bone topography and surrounding craniofacial structures. This level of precision enabled predictable reconstruction while ensuring optimal aesthetic and structural restoration.
- Patient-specific solution minimized surgical guesswork and reduced the risk of implant migration, malposition, or extrusion. In addition, the tailored fit allowed for minimal soft-tissue manipulation, contributing to reduced tissue trauma and improved postoperative recovery.

Clinical outcomes



- The patient-specific implant enabled accurate restoration of the frontal contour with improved facial symmetry and skeletal alignment. Postoperative recovery was uneventful, with stable implant fixation and satisfactory functional and aesthetic outcomes.