NEED A NEW SKULL OR MANDIBLE: 3D PRINT IT!

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WHAT ARE CRANIO-MAXILLOFACIAL DEFECTS?
MEDICAL CAD-CAM
RAPID DESIGN AND MANUFACTURING

1. MEDICAL REVERSE ENGINEERING (SCANNING)
2. COMPUTER AIDED DESIGN (CAD)
3. COMPUTER AIDED MANUFACTURING (CAM)
PATIENT

Young girl

- Car accident with large skull defect
- Reconstruction with titanium implant
  (electron beam melting)
Final design
Implant

Ti6Al4V

ELECTRON BEAM MELTED (EBM) (ARCAM)
Variety of materials to reconstruct defects

Using selective laser melting to build patient-specific implants from Ti6Al4V ELI creates the possibility of adding porosity throughout the material with unlimited shape complexity.

This titanium alloy is commonly used in medical applications due to its strength, low weight and excellent biocompatibility.

OXPEKK OsteoFab™ is available from Q4 of 2011 and utilises an inert biocompatible, synthetic OXPEKK®-IG polymer which has a long history of safe implantation.

PEEK-OPTIMA® is a versatile polymeric biomaterial with strong and durable characteristics. A superior combination of high strength, stiffness and toughness, together with its proven biocompatibility, make PEEK-OPTIMA ideally suited for patient-specific implants.
NEW DEVELOPMENTS

INTERFIX®
EASY FIXATION
TANGENTIAL SCREW FIXATION
MANDIBULAR CASE

• WOMEN  83 y.
• Med. Hist. : Osteoporosis
• Problem : large chronic wound / ulcer chin area
• Diagnosis
  — extensive bone destruction
  — fast progressive osteomyelitis
PRE-OP X-RAY

CT-SCAN

NUCLEAR SCAN
CURRENT STANDARD CLINICAL PROCEDURE

• Vascularized bone transplants
  • Fibula
CURRENT STANDARD CLINICAL PROCEDURE

Custom bended reconstruction plate with condylar head part
Computer Aided Design (CAD)
Computer Aided Design (CAD)
RENDERED FINAL DESIGN
Computer Aided Manufacturing (CAM)

Raw material: titanium powder

SLM Selective Laser Melting

3D CAD design

Materialise Software

LayerWise
Your partner in Metal Rapid Manufacturing
PLASMA COATED HYDROXY-APATITE
7-part osteotomy
OPERATION VIDEO

• NOW FOLLOWS OPERATION VIDEO

• NOT SUITED FOR SENSITIVE VIEWERS!
CONCLUSION

CUSTOM AND PATIENT SPECIFIC IMPLANTS MANUFACTURED BY 3D PRINTING AND ADDITIVE MANUFACTURING WILL BECOME STATE OF THE ART IN CUSTOM IMPLANT TREATMENT IN NEAR FUTURE.
THANKS FOR YOUR ATTENTION!