

Clinical Data Summary

Materialise Glenius Glenoid Reconstruction System

The clinical data on the use of the Glenius Glenoid Reconstruction System show that the preoperative planning combined with patient-specific instrumentation and implants, produced by additive manufacturing technologies (plastic and metal), help to provide a good fixation of the glenoid component. Therefore, Glenius represents a viable solution for shoulder replacements intended for patients with severe bone defects.

Publication	Key points
<p>A patient-specific guide for optimizing custom-made glenoid implantation in cases of severe glenoid defects: an in vitro study</p> <p>(Eraly, Stoffelen, Vander Sloten, Jonkers, & Debeer, 2016)</p>	<ul style="list-style-type: none"> • Glenoid defects were created in 10 cadaveric shoulders • 5 glenoid components were positioned using positioning guides, the other 5 without guides • Patient-specific positioning guides significantly improved the position and fixation of a custom made glenoid component in cases of severe glenoid defects
<p>The use of 3D printing technology in reconstruction of a severe glenoid defect: a case report with 2.5 years of follow-up</p> <p>(Stoffelen, Eraly, & Debeer, 2015)</p>	<ul style="list-style-type: none"> • Case report of a patient undergoing a total shoulder arthroplasty (revision) • A 3D visualization of the damaged glenoid was made to develop a preoperative surgical plan • A patient-specific glenoid component was designed and produced using additive manufacturing • Short term postoperative follow-up indicated excellent results
<p>Bone ingrowth and biological fixation of selective laser melted porous scaffolds for the reconstruction of severe bone defects.</p> <p>(Demol, Lenaerts, Leuridan, De Boodt, & Delpont, 2012)</p>	<ul style="list-style-type: none"> • PorousTi implants have good osseointegration characteristics. The titanium surface allows good bone apposition. The porous structure enables the bone to grow into the pores of the construct so that strong biological fixation of the implant in the bone is achieved.

Conference posters and presentations

The Glenius technology was presented in the following the following conference posters and presentations:

- Reconstruction of severe glenoid defects with a custom-made patient-specific glenoid component – Philippe Debeer, Orthopaedica Belgica 2018
- 2 stage revision for major glenoid defects: application of 3D CT planning and custom made implants – Gert Van Den Bogaert, Orthopaedica Belgica 2018
- Management of glenoid bone loss in primary RSA, O. Verborght, Berlin Shoulder Course 2016
- Treatment of shoulder periprosthetic joint infection, P. Debeer, Orthopaedic Revision Forum 2015
- Patient-specific instrumentation in reversed shoulder arthroplasty, O. Verborght, Orthopaedic Revision Forum 2015
- Glenoid reconstruction with allograft-autograft: a biological solution, R. Ihrman, Orthopaedic Revision Forum 2015
- The advantage of 3D printing in complex glenoid reconstructions, D. Stoffelen, Orthopaedic Revision Forum 2015
- Achieving optimal custom-made glenoid implant position and fixation using patient-specific guides in cases of severe glenoid defects, K. Eraly, CORS 2013
- Custom metal augments produced by selective laser melting for the reconstruction of severe bone defects; in vivo evaluation of bone ingrowth and biological fixation, J. Demol, EFORT 2013
- A patient-specific guide for optimizing custom-made glenoid implant positioning in cases of severe glenoid defects, P. Debeer, SECEC 2013
- CT-based computerized planning method for shape reconstruction of severe glenoid defects, K. Eraly, EFORT 2012
- Bone ingrowth in porous titanium bone augments in in vivo goat model: customization and functionalization, J. Demol, EORS 2012
- Bone ingrowth and biological fixation of selective laser melted porous scaffolds for the reconstruction of severe bone defects, J. Demol, TERMIS World Congress 2012
- Computer-based planning method for shape reconstruction of severely damaged glenoids, K. Eraly, CARS-ISCAS 2011
- CT-based virtual shape reconstruction for sever glenoid bone defects, K. Eraly, TGCS 2011

References

- Demol, J., Lenaerts, B., Leuridan, S., De Boodt, S., & Delpont, P. (2012). Bone ingrowth and biological fixation of selective laser melted porous scaffolds for the reconstruction of severe bone defects. *Journal of Tissue Engineering and Regenerative Medicine*, 6(Suppl 1), 401.
- Eraly, K., Stoffelen, D., Vander Sloten, J., Jonkers, I., & Debeer, P. (2016). A patient-specific guide for optimizing custom-made glenoid implantation in cases of severe glenoid defects: an in vitro study. *Journal of Shoulder & Elbow Surgery*, 25(5), 837-845.
- Stoffelen, D. V., Eraly, K., & Debeer, P. (2015). The use of 3D printing technology in reconstruction of a severe glenoid defect: a case report with 2.5 years of follow-up. *J Shoulder Elbow Surg*, 24, e218-22.