CUSTOM MADE IMPLANTS IN FAILURE OF ACETABULAR REVISION SURGERIES

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BACKGROUND:
Custom 3D-printed acetabular implants are a new technology used in hip surgery with ever-increasing frequency. Its offer patient-specific implants to optimize filling of bone defects and implant-bone contact, without the need for combination of augments, bone and cup. The 3D Printing (EBM) technology permits to create an extremely flexible patient matching implant and instrument, with material performances not viable with standard manufacturing process.

METHODS:

Beetwen July 2015 and June 2017 4 cases (2 men and 2 women) of Lima-Promade acetabular customized implants were performed. All the patients had undergone at least 2 cup revision surgeries with bad results. The implant has been developed by Electron-Beam Melting (EBM) technology based on a precise analysis of patients' preoperative CT scans. Dedicated visual 3D tools and instrumentations to improve implants congruency was used. Primary stability was enhanced and tailored on patient's anatomy by means of press-fit, iliac stems and the high friction performances of Trabecular Titanium matrix. Mean age at surgery was 51.5 years (range 25-72). All patients underwent an immediate mobilization with full weight-bearing. Patients were reviewed clinically and radiographically at follow-up.

RESULTS:
Incompatibility or impingement between the stems and new acetabular component was not observed. No signs of miss-match between intraoperative bone conditions and pre-operative planning were observed. No additional bone grafts or further native bone removal were needed. Biomechanical parameters were restored by using internal modularity (i.e. face-changers / angled spacers) that were needed as the stem was not changed. No needed dual mobility components. No intraoperative complications were observed. Mean Harris Hip Score increased significantly from 13.9 (range 6.9-20.6) preoperatively to 75.8 (range 53.9-94) at last follow-up (mean 28.5 months, range: 21-44), showing an improvement in terms of both pain relief, function and joint mobility. Radiographically neither signs of instability, migration nor tilting were observed. No case of dislocation nor infection were recorded despite the high number of interventions already suffered by the patients.

CONCLUSION:
The Lima-Promade custom-made acetabular system showed encouraging results in failure of previous acetabular revision surgeries. The optimal primary stability of the implants promoted an early osseointegration with the remaining bone stock. Further analysis with more cases and a longer follow-up are necessary for a complete clinical and cost-effective evaluation, but sometimes what could be the alternatives?