3D printed acetabular prosthesis versus augment/bone graft+revision prosthesis for Paprosky Ⅲ type bone defects

Bin-Fei Zhang[1], Jun Wang
[1]Xi'an Jiaotong University

INTRODUCTION:
3D-printed prosthesis was increasingly popular in the acetabular revision of THA, especially when the bone defect was irregular and large or osteolysis. This study aimed to evaluate the role of the 3D-printed prosthesis in revision THA in the mid-term, compared to conventional augment/bone graft+revision prosthesis.
METHODS: In this retrospective study, the aseptic revision THA patients with prosthesis loosening and acetabular bone defects were screened between May 2010 and March 2015, and we included the patients receiving the 3D-printed acetabular prosthesis or augment/bone graft+revision prosthesis. The patients' demographic characteristics of the patients were collected.
RESULTS: A total of 79 patients (81 hips) with an acetabular revision using 3D-printed prosthesis or augment/bone graft+revision prosthesis were included. Thirty-six patients were men (45%), and 43 were women (55%); the mean age was 64.5 years (47 to 85), and the mean follow-up was 101 months (77 to 125). Thirty-eight hips (47%) had a Paprosky ⅢA type defect, and 47 (53%) had a type ⅢB defect. There were 33 (34 hips) and 46 (47 hips) patients in the 3D-printed prosthesis and the augment/bone graft+revision prosthesis groups, respectively. At the last follow-up, all hips in the 3D-printed prosthesis group remained well-fixed, and implant survival was 100%, with the need for re-revision as the endpoint. In contrast, five patients failed in the augment/bone graft+revision prosthesis group. The revision prosthesis aseptic loosening occurred in four patients, and prosthesis joint infection occurred in one patient. The patients with prosthesis joint infection died after one year of revision surgery. Excellent pain relief in all patients (mean WOMAC score pain 89.5, (37.7 to 100)) and functional outcomes (mean WOMAC function 89.3 (33.5 to 100), mean OHS 90.3 (32.1 to 100)) were noted. Patient satisfaction scores were excellent.
DISCUSSION AND CONCLUSION: This study demonstrated satisfactory mid-term clinical and radiological outcomes of using 3D-printed prosthesis in revision THA, compared to augment/bone graft+revision prosthesis.