

POSTER 87

TITLE: Allograft Prosthetic Composite Reconstruction of Bony Defects following Pelvic Tumor Resection

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BACKGROUND: Prior to the rise in metal pelvic reconstruction, massive pelvic allografts were a popular reconstructive option in the setting of massive bony defects following resection of pelvic tumors. Additionally, in the setting of massive pelvic defects with accompanying acetabular or hip lesions, allograft prosthetic composite (APC) reconstruction of the hip represented a useful option for limb salvage, by combining to utility of endoprosthetic reconstruction. Popularity of pelvic allografts has decreased given concerns regarding graft resorption, graft fracture, and issues relating to graft integration. Although APC reconstruction of the pelvis has decreased in usage, many patients are alive with these constructs and should be expectantly managed in regard to long term complications and hardware survival.

QUESTION/PURPOSE: The goal of the study was to describe the stabilization and survival of allograft prosthetic composites used for reconstruction of pelvic defects following pelvic sarcoma resection and timeline for construct revision. Additionally, this study details the complication rates in regard to prosthesis-related issues versus allograft related complications.

PATIENTS/METHODS:

Patients undergoing APC reconstruction were queried from a large database of pelvic resections, performed at one tertiary academic center from 1992-2018. Patient and surgical data were manually extracted from the electronic clinical record. Patients were included if they underwent reconstruction by both allograft and hip prosthesis and had at least 1 year of follow-up. Follow-up data was extracted from the electronic clinical record. Prosthesis related complications were classified by the Henderson Classification scheme for endoprosthetic failures (type I – soft tissue failure, type II – aseptic loosening, type III – structural failure, type 4 – infection, type IV – tumor progression). Statistical analysis was performed in Microsoft Excel.

RESULTS:

26 patients were included in the sample, including 16 males and 10 females with an average age of 51.5+/-17.6 at the time of resection. Resection was performed for primary tumors (20, 76.9%), recurrent tumors (3, 11.5%), and oligometastatic metastatic tumors (3, 11.5%). The distribution of pelvic resections was as follows: type I (12, 46.2%), type IIA (22, 84.6%), type IIB (4, 15.4%), type III (19, 73.1%), type IVA/B (8, 30.8%). Mean tumor volume was 919.8cm³.

All patients underwent reconstruction with freshly thawed pelvic allografts, except one patient who underwent reconstruction with a proximal tibia allograft. 10 Patients had reconstruction plate only fixation, 6 had screw only fixation, while 9 had combined plate/screw fixation. 16 patients underwent acetabular and femoral arthroplasty, while 10 underwent femoral sided hemiarthroplasty. 8 acetabular components included constrained liners. 8 constructs were cemented.

Post-operatively, 12/26 patients required treatment for deep infection, 5/26 patients had local recurrence, and 7/26 had subsequent metastatic disease. Prosthesis complications, by Henderson class, had the following distribution: type IA (1), type II (3), type IVA (1), type IVB (3), type VB (1). Hardware revision was indicated in 10/24 patients, with a mean time to revision of 3.3+/-2.17 years.

At final follow-up the following complications were noted in relation to allograft survival: acetabular migration (6/26), allograft resorption (4/26), allograft fracture (5/26), allograft fixation hardware failure (7/26). Mean time to

fixation failure was 6.1+/-5.1 years. Allograft explantation was required in 12/24 cases, with a mean time to allograft explant of 4.6+/-2.6 years.

At final follow-up, 5 patients were ambulatory without assistive devices, 16 were ambulatory with an assistive device, and 2 were wheelchair mobilizers.

CONCLUSION:

This study details the survival and complications associated with allograft-prosthetic composites in the setting of pelvic lesion resections. The results presented here help guide the anticipated management of patients with APCs and detail the expected modes and timeline of failure. Infection remains a significant issue in pelvic reconstruction, as noted in this series. There were high rates of complications noted in regard to both prosthetic components and allograft survival. Of note, a significant number of patient had radiographically noted early acetabular changes (15/24) but only 12/24 patients required allograft explantation. Further work is needed to stratify construct survival by fixation type, the role of deep infection in implant survival, and further report patient reported outcomes following APC reconstruction.