Massive Acetabular Allograft Transplantation In Severe Bone Defect Hip Revision: A 22 Years Of Experience

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INTRODUCTION

Acetabular reconstruction in severe defects still represents a challenging procedure. We describe the experience matured in the last 22 years in our institutions with the use of fresh-frozen acetabular allografts in type Gross III and IV acetabular defects. Our initial hypothesis was that by means of massive acetabular allograft bone stock, approximation to natural hip rotation center could completely be re-established, all this combined with satisfactory results along the years. We hypothesize that the correct match sized graft selection, custom intraoperative preparation and correct fixation under host-graft distraction represented fundamental factors in the result of this procedure.

MATERIALS AND METHODS

A series of 44 acetabulum massive allografts implanted for reconstruction of severe acetabular defects were included in this study. Any cases where the microbiologists commented that contamination was likely were excluded. Mean follow up was 14.2 years (range 10 -21). Mean patients’ age was 58.8 (range from 19 to 83 years). According to Gross Classification, 26 cases had acetabular defects type III, while 18 were type IV. Patients were evaluated through the Merle D’Aubigne score (mean pre-op pain was 2.2 and gait was 2.5); radiographic evaluation of allografts and acetabular cups was performed according to Engh Criteria. A Kaplan-Maier survivorship curve was established considering endpoint any eventual revision.

PRES-OPERATIVE STUDIES

1. Acetabular defect classification by means of CT scan with 3D reconstruction
2. Exclusion of infection (C-Arm guided arthrocentesis, leukocytes scintigraphy, C-reactive protein, erythrocyte sedimentation rate)
3. Vascular study (CT-Angiography)

HISTOLOGICAL FINDINGS

Jan 1989 – Jan 2010 71 allografts
Revision of 44 cases
Mean 14.2 years

<table>
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<tr>
<th>Age</th>
<th>Max 83 yo</th>
<th>Min 19 yo</th>
<th>Mean 58.8 yo</th>
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<td>Sex</td>
<td>Male 15 - Female 29</td>
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Follow-up
Max 22 years
Min 10 years

Gross, Ribau et al. CORR 2006
RESULTS

In 43 cases (97.2%) the allograft was implanted under distraction to obtain pressfit with host bed before definitive cementless cup was inserted. At the follow-up in 42 transplantations (95.4%) radiological homogenization of the trabecular pattern was observed, indicating, not only interface healing but also a certain remodelling process when compared to other bulk allografts. Complications: there were 3 deep infections (6.8%) and 8 cases of aseptic (18.1%) loosening of the acetabular component combined with partial graft collapse. In 10 out 11 a new over dimensioned cup implantation was undertaken, without further loosening. According to the Kaplan Meyer’s curve, the overall survival rate was 80.5% and 76.4% in the cases of Gross III (major columnar defect). Controversial defects associated with pelvic discontinuity (type Gross IV) provided significantly higher survivorship (85.7%, p = 0.018) when compared to Gross III. Improvement of Merle D'Aubigne Score was observed in pain as in gait (mean post-op pain was 5.4 and gait 4.9 at the last follow-up).

DISCUSSION AND CONCLUSION

The literature has described in the last decade a high failure incidence of massive acetabular allografts in the midterm in severe defects. There are a variety of techniques. It seems that case series of cup-cage and impacted or structural allografts combined with connecting ilioischial support rings provide the longest lasting results. However no other long serie of massive acetabular allografts like this has been described in the literature, probably because it is more demanding in its different steps. From our experience we cannot affirm, that all has been said in severe acetabular reconstruction. This technique should be taken into consideration at least as salvage procedure to other standard techniques. Don’t forget that at worst after massive acetabular transplantation a further overdimensioned cup implantation has been possible to undertake according to our experience.