INTRODUCTION: Native glenoid bone loss presents technical challenges in shoulder arthroplasty. Significant bone loss can be managed with metal augments, autografts, allografts, and custom implants. We observed that in many cases of glenoid bone loss the defect tends to mirror the shape of the humeral head, and that the humeral head seemed to fit the glenoid defect perfectly (Figure I). Because the glenoid component in our preferred RSA implant is screwed into position, it seemed intuitive for a patient’s humeral head might serve as an ‘internal’ bone graft to correct severe bone loss and restore the native paleoglenoid morphology. In the present study, we report the mid-term clinical and radiographic outcomes of patients treated with structural humeral head autograft reconstruction of glenoid bone loss in the setting of reverse total shoulder arthroplasty (rTSA).

RESULTS SECTION: 30 shoulders in 28 patients were included in this study. Seventeen shoulders had rotator cuff tear arthropathy, seven shoulders had osteoarthritis with posterior glenoid bone loss along with posterior instability and tears to the superior subscapularis with fatty atrophy of the muscle belly, four shoulders had rheumatoid arthritis with erosive bone loss and rotator cuff insufficiency, and two shoulders had post-traumatic arthritis. Since the glenoid defect modelled via 3D printed augments, talus augments, and talus cortical augments, it was possible to reconstruct the defect using a humeral head autograft. This research was supported by a grant from The University of Vermont Larner College of Medicine and the University of Vermont Department of Orthopaedics.

DISCUSSION: The use of a humeral head autograft to reconstruct glenoid bone loss in patients undergoing rTSA is a safe and effective procedure. It allows for a local graft source to be utilized thus avoiding potential comorbidity and complications associated with the use of alternative site autografts or allografts and has the advantage of nearly congruent fit within the defect.

SIGNIFICANCE/CLINICAL RELEVANCE: For patients with severe bone loss to the glenoid, with or without concomitant rotator cuff arthropathy, RTSA with autograft humeral head bone augmentation seems to be a viable surgical option that has not previously been described.

ACKNOWLEDGEMENTS: This research was supported by a grant from The University of Vermont Larner College of Medicine and the University of Vermont Department of Orthopaedics.