

Femoral Head Allograft Reconstruction for Proximal Humeral Fractures with Bone Loss: A Retrospective Case Series



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Background

Proximal humeral head fractures Account for 5-6% of all adult fractures [1]. Complex, multi-fragmentary proximal humeral fractures with substantial metaphyseal bone loss present significant reconstructive challenges. Structural allograft can augment fixation by aiding restoration of anatomy, providing stability and preserving native joint function [2]. We report clinical and radiological outcomes following proximal humeral reconstruction with femoral head allograft.

Methods

Complex, multi-fragmentary proximal humeral fractures with substantial metaphyseal bone loss present significant reconstructive challenges. Structural allograft can augment fixation by aiding restoration of anatomy, providing stability and preserving native joint function. We report clinical and radiological outcomes following proximal humeral reconstruction with femoral head allograft.

Conclusion

Femoral head allograft reconstruction for proximal humeral fractures with bone loss achieved high union rates, satisfactory function, and low complication rates in this series. This technique is a viable option in selected patients.

Results

Mean follow-up was 3 years 5 months (range 3 months–5 years 4 months).

Index Fracture Pattern

Six varus collapse (one posterolateral), two valgus impacted 4-part, one 2-part surgical neck, one medial displacement.

Function

Functional Score	Mean Score	Range of Motion	Mean ROM (Degrees)
Quick-DASH	32.5	Forward Flexion	109
Occupational-DASH	21.9	Abduction	118
Sports/Arts-DASH	4.2	External Rotation	44
Visual Analogue Scale	2.2	Internal Rotation	L1
Constant-Murley	55.6		

Radiology

Eight cases achieved union, and two cases developed avascular necrosis (AVN) – one asymptomatic, one with early osteoarthritis.

Complications

One superficial infection with plate migration (healed without reoperation), one screw prominence requiring removal. Two patients had persistent mild neurological symptoms; one pre-operative brachial plexus injury resolved. No deep infections or reoperations for non-union.

Patient satisfaction

All patients reported satisfaction.

References

1. Handoll H, Brealey S, Rangan A, Keding A, Corbacho B, Jefferson L, Chuang LH, Goodchild L, Hewitt C, Torgerson D. The ProFHER (PROximal Fracture of the Humerus: Evaluation by Randomisation) trial - a pragmatic multicentre randomised controlled trial evaluating the clinical effectiveness and cost-effectiveness of surgical compared with non-surgical treatment for proximal fracture of the humerus in adults. Health Technol Assess. 2015 Mar;19(24):1-280. doi: 10.3310/hta19240. PMID: 25822598; PMCID: PMC4781052.

2. Leiblein M, Verboket R, Marzi I, Wagner N, Nau C. Nonunions of the humerus - Treatment concepts and results of the last five years. Chin J Traumatol. 2019 Aug;22(4):187-195. doi: 10.1016/j.cjtee.2019.04.002. Epub 2019 May 4. PMID: 31109830; PMCID: PMC6667773.