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Despite various forms of operative treatment, outcomes have been variable after displaced multi-fragment proximal humeral fractures. A significant number of fixation failures and avascular necrosis of humeral head occurs (up to 77 percent). Biomechanical studies on the locking proximal humeral plate indicate the locked screw-plate combination is a more stable construct than conventional implants. The purpose of this study is to evaluate the clinical and radiological outcome in patients who have undergone operative treatment using this implant.

Twenty-three patients with displaced proximal humeral fractures underwent surgery using this implant. The mean age was 63.6 years (range, 40–85). Nineteen patients were female and 4 were male. The mean follow-up duration was 22.2 months (range, 5–38). All patients had a fracture configuration that required operative treatment. Three patients were lost to follow-up leaving 20 patients available for review. Patients were assessed clinically using the Constant score, pain scale and satisfaction scale. General health was assessed using the SF-12 survey. Radiographs were assessed looking at the initial reduction to determine whether an anatomical reduction with calcar support correlated with a better outcome.

The mean constant score was 62 (32.5–85). The mean age and sex-adjusted constant score was 83 percent (46–117). The mean pain score was 26mm (100mm scale), and the mean satisfaction score was 84 percent. Patients that were 60 years or younger had a lower age and sex adjusted constant scores (78, range 58–109 percent) than those over 60 years (87, range 46–117 percent) despite a better absolute score (63 vs. 61). The Physical Component Score of the SF-12 was better in the younger age group than it was in the older group (43 vs. 38) although the Mental Component Score was lower (45 vs. 54). Overall satisfaction was also lower in those 60-years and younger (79 compared with 86 percent). This may be explained by higher social demands on younger patients. Only 3 patients sustained the injury as result of high-energy trauma. These patients were significantly younger (50, range 40–56) than the low energy trauma group (65, range 46–85). Patients that sustained high-energy
trauma had a better clinical outcome with a mean constant score of 74.3 compared with 59.6 for the low energy trauma group.

Nine patients did not have adequate medical (calcar) support with the initial reduction. Four of these patients developed complications. Two patients developed AVN requiring a hemi-arthroplasty. One patient had a valgus collapse of the head fragment and screw penetration requiring removal. One patient had a non-union requiring bone grafting and re-plating.

The proximal humeral locking plate provides a good clinical outcome. The results of this study correlate with the limited data available on these implants in the literature. A clinical benefit over alternative procedures is yet to be elucidated by a randomised clinical trial. An anatomical reduction with calcar support appears to result in a lower complication rate.

Footnotes

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Declaration of interest: a