A Retrospective Review of Long-term Patient Reported Outcome Measures Comparing Unstable Ankle Fractures with and without a Posterior Malleolus Fracture

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INTRODUCTION: Consensus regarding the optimal investigation and management of unstable ankle fractures with posterior malleolar involvement remains elusive. The aim of this study was to evaluate the long-term outcomes of patients who had sustained an unstable ankle fracture with a posterior malleolus fracture (PMF) and without (N-PMF).

METHODS: All adult patients aged ≥16 years presenting to a single large academic trauma centre between 2009 and 2012 with an unstable ankle fracture requiring surgery were identified. Data collected included patient and injury demographics, fracture classification, posterior malleolus fracture articular surface percentage involvement (ASPI) measured from the lateral plain radiograph and management. Patients were followed-up via questionnaire at a minimum of 10 years post-surgery. ASPI was categorised into <20%, 20-33% and >33%. The primary outcome measure was the Olerud Molander Ankle Score (OMAS). Secondary outcome measures were the Manchester Oxford Foot Questionnaire (MOXFQ), Euroqol-5D (EQ5D) Index, Euroqol Visual Analogue Score (EQ5D-VAS) and post-operative complications.

RESULTS: There were 304 patients in the study cohort. The mean age was 49.6 years (16.3–78.3), 33% (n=100) male and 67% (n=204) female. There were 67% (n=204) with an associated PMF and 33% without (n=100). For the PMF group, 152/204 (75%) had an ASPI of <20%, 26/204 (13%) 20-33%, and 21/204 (10%) >33% ASPI. No patient received a computed tomography (CT) scan pre-operatively. Only 10% of PMFs (22/204) were managed with internal fixation (1/22 <20% ASPI, 6/22 20-33% ASPI, 15/22 >33% ASPI). At a mean of 13.8 years (11.3 – 15.3) the median OMAS score was 85 (IQR 60 - 100). There was no difference in the OMAS between the N-PMF and PMF groups (85 [IQR 56.25 - 100] vs 85 [IQR 61.25 - 100]; p = 0.580). There was no difference between groups for the MOXFQ (N-PMF 7 [IQR 0 – 36.75] vs PMF 8 [IQR 0-38.75]; p = 0.643), the EQ5D Index (N-PMF 0.8 [IQR 0.7 - 1] vs PMF 0.8 [IQR 0.7 - 1]; p = 0.720) and EQ5D VAS (N-PMF 80 [IQR 70 - 90] vs PMF 80 [IQR 60 - 90]; p = 0.224). Subgroup analyses of four groups (N-PMF, <20% ASPI, 20-33% ASPI and >33% ASPI) found a statistically significant difference in distribution for OMAS (p=0.042), with the >33% ASPI group having the worst median scores. There was no significant differences found for MOXFQ, EQ5D Index and EQ5D-VAS (all p>0.05). Assessment of post-operative complications revealed an overall infection rate of 5% (n=14). In the N-PMF group, 6% (n=6) acquired an infection versus 4% (n=8) in the PMF group (p=0.417). Revision rate in the N-PMF group was 4% (n=4) compared with 2% (n=4) in the PMF group (p=0.297). One patient in the N-PMF group required a further procedure due to deep infection versus none in the PMF group.

DISCUSSION AND CONCLUSION:

The presence of a PMF does not affect the long-term patient reported outcomes in patients with a surgically managed unstable ankle fracture. Patients with an ASPI of <20% account for the majority of complex ankle fractures. In our series, 99.3% of this group were treated non-operatively, and had comparable outcomes to patients without a PMF. Patients who sustain an unstable ankle fracture with a larger posterior malleolus fracture (>33% lateral ASPI) are at risk of less favourable longer-term outcome scores, even though most of these fractures were stabilized. Post-operative complications were comparable between ankle fractures with and without a posterior malleolus fracture in this series.