Does Surgical Approach Affect Quality of Life and Sexual Function Following an Acetabulum Fracture? A Retrospective Cohort Study in a Level-One Major Trauma Centre in the United Kingdom.

Sophia Maryam Wakefield¹, Nikolaos K Kanakaris², Peter Giannoudis³

¹Academic Department of Trauma & Orthopaedics, School of Medicine, University of Leeds, University of Leeds, ²Academic Dept of Trauma and Orthopaedics, ³Leeds Gen.L Infirm/Dept of Trauma & Ortho

INTRODUCTION:

Acetabulum fractures pose challenges to surgeons due to their complexity and requirement for direct anatomical access. There is currently a paucity of research exploring the use of "Patient Reported Outcome Measures" (PROMs) postacetabulum fracture, notably with specific reference to surgical approach outcomes. This retrospective cohort study primarily aimed to evaluate the impact of three surgical approaches on overall patient quality of life (QoL), with secondary aims to explore differences in QoL, with respect to sexual and urinary function, return to sport and pain. METHODS:

Adult patients (aged 18-65 years) were identified in a single, level-one Major Trauma Centre over an 18-year time-period (June 2004-December 2022). NHS Research Ethics Committee approval was obtained (23/NI/0163). Patients included were those who had sustained traumatic acetabulum fractures with a minimum follow-up of 12-months, underwent fracture fixation using either ilioinguinal (IL), Stoppa or Kocher-Langenbeck (KL) approaches, with no pre-injury ambulatory or urogenital pathology. Data collected included patient age, biological sex, injury mechanism, Injury Severity Score (ISS), Judet-Letournel classification, American Society of Anaesthesiology (ASA) grade, surgical approach and follow up time. QoL parameters included EuroQual–Visual Analogue Scale (EQ-VAS), International Index of Erectile Function, Female Sexual Function Index, Core Lower Urinary Tract Symptom Score (CLSS), Return to Sport after Serious Injury Questionnaire, and VAS for pain. Continuous variables were analysed using one-way analysis of variance, and for categorical variables, Pearson chi-squared tests were performed. Linear regression models were used to assess for differences in all but one QoL measure; for the satisfaction component of CLSS alone, logistic regression analysis and odds ratios (ORs) were calculated. $p \leq 0.05$ denoted statistical significance.

Out of 100 patients randomly selected and invited to participate, seventy (60 men; mean age[±SD]: 42.21[±14.25] years, range 18-65 years) were recruited. Three surgical approaches were assessed: IL (n=21), Stoppa (n=16) and KL (n=33). 51.4% sustained fractures as a result of road traffic accidents, 27.1% had falls from a height (≥2m), 17.1% fell from <1m, and 4.3% were due to contact-sport. 70.0% of patients had associated fracture-types, with significant differences demonstrated between surgical approaches (p<0.001). Mean ASA grade was 1.86[±0.79] (range 1-3), mean ISS was 26[±11.31] (range 4-48) and mean follow up time was 72.9[±54.8] months (range 15-240). 14/70 patients (20.0%) underwent THA post-acetabulum fixation (THA mean time: 23.3[±18.5] months, range: 1-60); of these 57.1% had associated fractures, 78.6% underwent a KL approach, and 14.4% a Stoppa approach. A trend was shown towards differences in EQ-VAS score between surgical groups (p=0.095). Compared to IL, there was strong evidence (p=0.031) that a Stoppa approach increased EQ-VAS by 12.26 points (95%CI[1.08,23.18]). With respect to male sexual function (SF), in all five erectile function (EF) domains, those with elementary fractures demonstrated score improvements in all surgical groups (p<0.05). The KL approach showed lower scores in all EF domains, with significance only reached in overall satisfaction (1.64 point reduction, 95%CI[-3.05,-0.22], p=0.027). No differences were demonstrated between IL and Stoppa approaches in all domains of male SF. An increased ISS reduced overall male SF satisfaction by 0.05 points (95%CI[-0.11,0.00]), p=0.045). Reductions in female SF scores following both KL and Stoppa approaches were demonstrated, when compared to IL, in all domains, although significance was not reached. Age significantly reduced female sexual arousal by 0.14 points (95%CI[-0.23.-0.06]; p=0.046) across all surgical groups. Stoppa and KL approaches increased urinary function total scores by 0.69 and 2.29 points respectively when compared to IL, and males demonstrated worse scores (by 2.03 points); however, no significance was reached. Elementary fractures were more likely to be associated with urinary satisfaction (OR 0.19, 95%CI[0.02,0.94], p=0.060), but no significant differences were observed between surgical approaches. Stoppa and KL approaches had superior but not significant 'return to sport' scores when compared to IL, although the Stoppa performed slightly better. For VAS pain scores, there was strong evidence (p=0.023) that elementary fractures reduced pain scores by 1.82 points (95%CI[-3.35,-0.29]). No significant differences were demonstrated between surgical approaches; however, the Stoppa approach did appear to improve pain scores by 0.41 compared with the IL approach (p=0.640).

DISCUSSION AND CONCLUSION:

This study is novel as it evaluates QoL outcomes and sexual function using validated measures with respect to three wellestablished surgical approaches, and directly addresses PROMs associated with the relatively newer Stoppa approach. QoL does appear to be influenced by surgical approach in relation to PROMs; noteworthy, the Stoppa approach was associated with a significantly higher overall QoL score when compared to IL. The KL approach was associated with a significant reduction in overall male SF satisfaction. However, no further differences were observed in both male and female sexual and urinary function, return to sport and pain outcome domains between the approaches. The differences in QoL noted between surgical approaches require further investigation. Future research should address a wider range of PROM domains with larger patient cohorts.