Risk Factors for Complications Following Operative Fixation of Acetabular and Pelvic Ring Injuries: A Retrospective Analysis at an Urban Level 1 Trauma Center

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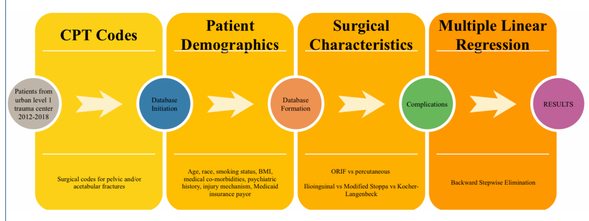
Introduction

- Pelvic ring and acetabular fractures are associated with significant morbidity and mortality
- Common co-morbid injuries include[1,2]:
  - Head injuries - 16-22%
  - Abdominal injuries - 8-28%
  - Thoracic injuries - 10-21%
  - Genitourinary injuries - 3-22%
  - Limb injuries - 35-41%
  - Spinal injuries - 2-4%
- Higher BMI has been associated with increased risk of postoperative infection[3]
- Increased LOS, current tobacco use, and concurrent trauma may also impact outcomes[4]
- Authors have suggested special precautions for obese and high-risk patients such as:
  - Decreased initial weight-bearing
  - Slower progression of weight bearing
  - Closed reduction and percutaneous pinning vs open surgical exposures[5]
  - Aggressive perioperative antibiotics
- **PURPOSE**: Identify risk factors for complications, including infection or reoperation, following operative fixation of pelvic ring and acetabular fractures.

Methods



A post hoc power analysis was conducted with desired statistical power of 0.80, which revealed that the sample size required for adequate statistical power for this study was 926 for small effects, 135 for moderate effects, and 66 for large effects.

Results

Table 1. Patient Demographics

Demographics	N=126
Age<65	97 (77%)
Male	79 (63%)
Race: White	60 (48%)
Race: Black	43 (34%)
BMI 18.5-29.9	75 (60%)
BMI 30-39.9	41 (33%)

Co-morbidities	
Diabetes Mellitus	13 (10%)
Hypertension	37 (29%)
Cardiac Disease	9 (7%)
Psychiatric Disease	20 (16%)

Variables	
Percutaneous	44 (35%)
ORIF	63 (50%)
Average LOS	15 days
Average Documented Follow Up	8.5 months

Complications	
Infection Rate	7 (6%)
Reoperation Rate	10 (8%)

Table 2. **REOPERATION** Regression Analysis

	OR (Confidence Interval)	P-value
BMI ≥ 30*	1.13 (1.02-1.26)	0.020
Ilioinguinal Approach*	7.63 (1.36-43.48)	0.021
Psychiatric Diagnosis	3.95 (0.90-17.54)	0.069
Medicaid Payor	3.92 (0.87-17.54)	0.074

* Statistically significant

Table 3. **INFECTION** Regression Analysis

	OR (Confidence Interval)	P-value
BMI ≥ 30*	1.18 (1.03-1.35)	0.016
LOS*	1.04 (1.01-1.08)	0.033
Ilioinguinal Approach*	29.41 (1.88-500)	0.016
Heart Disease	21.74 (0.98-500)	0.052
Positive Smoking Status	4.39 (0.62-31.25)	0.138

* Statistically significant

Common Surgical Approaches to Pelvis and Acetabulum

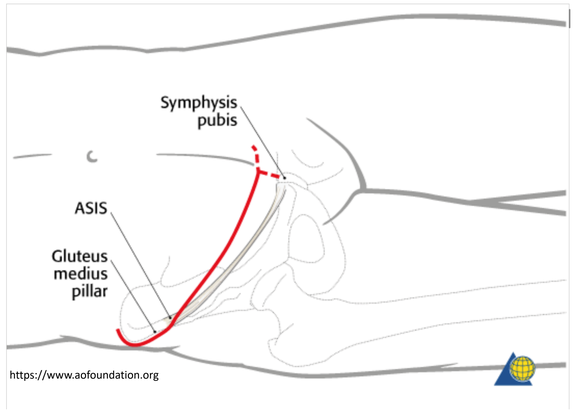


Figure 1. Ilioinguinal Approach (12 / 63)

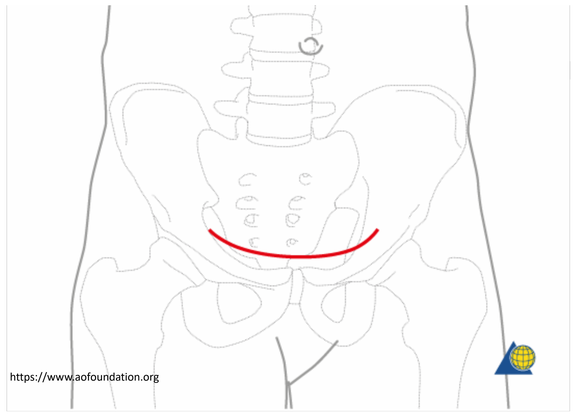


Figure 2. Modified Stoppa Approach (24 / 63)

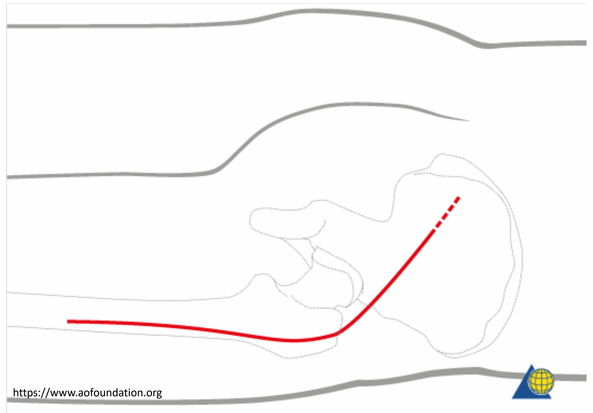


Figure 3. Kocher-Langenbeck Approach (25/63)

Discussion

- **Higher BMI** may increase complication rate
  - Increase hardware strain, poor soft tissue envelope & larger dissections?
- **Longer LOS** may increase infection rate
  - More co-morbidities & increased exposure to hospital pathogens?
- **Surgical approach** affects infection & reoperation rates
  - Extended infectious nidus or longer procedure duration?
- Co-morbid **psychiatric history** *trend* towards increased reoperation rates
  - Some studies show patients with concurrent psychiatric diagnosis undergoing orthopedic procedures had higher risk of prolonged LOS, surgical complications, and mortality (n=563,964)[6]
  - Influence of psychiatric dx in orthopedic trauma:
    - Tibial plateau fractures[7]
    - Distal humerus fractures[8]
    - Shoulder surgery[9]
    - Elderly hip fractures - longer LOS & increased likelihood of discharge to alternative living situation
- **Insurance carrier** *trend* towards increased re-operation rate for Medicaid payor in pelvic fracture repair
  - Similar findings in other studies:
    - Total hip, knee & shoulder arthroplasty[10]
    - Various spine surgeries[11,12]
- **CONCLUSION**: Identifying factors that influence post-operative outcomes can help surgeons better educate patients and mitigate risk by utilizing harm reduction strategies in high risk patients
- **Future Prospects**: We did not find concurrent injuries to increase complication rates but this study did not investigate specific organ system injuries as single variables. This information would be valuable as many subjects are polytraumas. **Large multi-center studies with increased power are needed to validate and/or elucidate these findings**

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