

## ***Areas of the Pelvic Anterior and Posterior Column Corridors: A Comparison Between Age and Gender***

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**Introduction:** Acetabular fractures are a relatively uncommon injury with a reported incidence around 3/100,000 per year. The standard of care treatment for acetabular fractures is open reduction and internal fixation. Percutaneous screw fixation of is an alternative treatment option, however it is a technically demanding procedure. The surgeon must appreciate the three-dimensional architecture of the pelvis while utilizing two-dimensional fluoroscopy to guide the screw. Although rare, placement of the screw into the hip joint or neurovascular structures are a major risk of the procedure. The objective of this study is to identify if patient demographics alter the measurements of the bony anatomy of the pelvis.

**Methods:** This is an IRB-approved retrospective chart review, conducted at two Level-1 trauma centers. CT scans of the pelvis were utilized as a primary data source. The patient demographic variables analyzed include gender, age, history of osteoporosis, and smoking status. The outcome variable for this study is the measurements of the anterior and posterior column of the pelvis.

**Results:** 213 patients were included in this study (114 Male, 99 Female). Patients were stratified into three age groups: <30, 31-60,>60. The smallest section of the anterior and posterior corridors was located at the obturator canal (avg 54.6mm<sup>2</sup>) and middle 3<sup>rd</sup> posterior wall (avg 395.6 mm<sup>2</sup>), respectively. Stratifying data by age, significant differences were found at the psoas groove (p=0.05), upper 3<sup>rd</sup> posterior wall (p=0.04), Lower 3<sup>rd</sup> posterior wall (p=0.012), and ischial tuberosity (p=0.048). Examining patients <30 y/o, males had significantly larger corridors at the iliopectineal eminence (p=0.02), anterior horn (p=0.015), obturator canal (p=0.007), pubic tubercle (p=0.021), upper, middle, lower 3<sup>rd</sup> posterior wall (p=0.001, p<0.001, p=0.001). For patients 31-60 y/o, males had significantly larger corridors at the psoas groove, iliopectineal eminence, anterior horn, obturator canal, pubic tubercle, upper, middle, lower 3<sup>rd</sup> posterior wall (all p<0.001). For patients >60 y/o males had larger corridors at all locations (p<0.01 except for ischial tuberosity (p=0.023)). The data for osteoporosis and smoking history were too limited to run a statistical analysis.

**Discussion:** The data presented demonstrates significant differences of the bony landmarks of the pelvis when analyzing gender and age. As percutaneous screw fixation for acetabular fractures becomes a versatile tool for orthopedic surgeons, further insight into patient specific anatomy may lead to decreased complications and operative time.

**Significance/Clinical Relevance:** This study can influence the safety of percutaneous acetabular surgery, and provide trauma surgeons additional information based on patient demographics.