

## **Surgical Management of U/H Type Sacral Fractures: Outcomes Following Iliosacral and Lumbopelvic Fixation**

*Meghan Kelly, MD, PhD<sup>1</sup>; Jun Zhang, MD<sup>2</sup>; Catherine A. Humphrey, MD; John T. Gorczyca; Addisu Mesfin, MD<sup>1</sup>*

<sup>1</sup>*University of Rochester, Rochester, New York, USA*

<sup>2</sup>*Zhejiang Provincial People's Hospital, Hangzhou, Zhejiang Province, CHINA*

**Purpose:** U and H-type sacral fractures are underdiagnosed injuries resulting from significant axial loading that are often associated with neurological deficits. Two methods of surgical management of these injuries involve the use of iliosacral screw fixation (ISF) and lumbopelvic fixation (LPF). However, there are no studies that have directly compared outcomes from the 2 procedures. The aim of the current study was to examine the surgical outcomes of patients undergoing ISF or LPF for U/H type sacral fractures.

**Methods:** The current study is a retrospective analysis of patients that underwent surgical fixation of a U or H type sacral fracture from 2004-2015 at one Level I trauma center. 16 patients met our inclusion criteria, 8 of whom underwent ISF and 8 underwent LPF. The average age of patients was 46.5 years (range, 16-80) with a mean follow-up of 13.9 months (range, 1-52). Surgical outcomes were compared using an unpaired Student t test or a Fisher exact test where appropriate.

**Results:** The majority of these fractures (9) were classified as type 2 using the Roy-Camille classification system. Six patients had the presence of a neurological injury at the time of presentation, 9 had concurrent spine fractures, and 10 had concurrent pelvic fractures. The majority of fractures occurring from a high-energy mechanism occurred in patients younger than 41 years of age, while all injuries occurring as a result of a ground level fall occurred in those over 64 years of age. There was no significant difference between the 2 groups with regard to age, ICU requirement, length of stay, or estimated blood loss (EBL). However, if those patients who underwent ISF and additional pelvic fixation were removed from analysis there was a significant difference in EBL ( $P = 0.01$ ). In addition, there was a significant increase in surgical time in the LPF group ( $P = 0.002$ ), likely reflecting the concurrent sacral decompression that was performed in 7 of 8 patients. Finally, there was a significant increase in those patients who underwent ISF who were discharged to a rehabilitation facility compared to those treated with LPF ( $P = 0.04$ ).

**Conclusion:** Patients with U/H type sacral fractures can be treated with ISF or LPF without an expected increase in hospital length of stay or need for ICU. Treatment with LPF may increase operative time and EBL if it is an isolated sacral injury. However, the ability for immediate weight bearing in the LPF group results in an increased likelihood of patient discharge to home instead of a rehabilitation facility.