

Fragility Fractures Requiring Special Consideration

Pelvic Insufficiency Fractures

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KEYWORDS

• Pelvis • Fragility • Fracture • Acetabulum • Insufficiency • Osteopenia

KEY POINTS

- Pelvis and acetabulum insufficiency fractures carry a significant morbidity and mortality risk.
- Pelvic fragility fractures can typically be managed without surgery but certain unstable patterns may require operative fixation.
- Presence of an insufficiency fracture, especially in the pelvis, can be the first presentation of osteoporosis, and therefore all patients require a full metabolic bone workup.
- Approved pharmacologic agents should be used as adjunctive treatment of any pelvic fragility fracture.

INTRODUCTION

Fractures of the pelvis and acetabulum in osteoporotic bone represent an important subset of fragility fractures. Pelvic fractures in the elderly patient carry a significant 1-year mortality risk, comparable to that of hip fractures.^{1,2} Furthermore, the incidence of pelvic fragility fracture is increasing with overall population age, placing a significant burden on patient, provider, and society.³

Pelvic insufficiency fractures impart pain and mobility challenges that often result in decreased independence in a previously high-functioning patient. Therefore, the primary treatment goals in the osteoporotic patient are centered in improving mobility and balance to restore preinjury autonomy. Providers must have an understanding of the unique anatomic and biomechanical characteristics of the pelvis/acetabulum as well as the available treatment strategies. This article aims to provide an overview

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of pelvic insufficiency fractures, demonstrate the anatomic relationships in the pelvis, outline necessary diagnostic techniques, and review operative and nonoperative treatment strategies.

Epidemiology

Pelvis fracture epidemiology

Pelvic fractures account for 7% of all fragility fractures and incur 5% of the total cost for care of osteoporotic fractures in patients older than or equal to 50 years.⁴ Most of these fractures occur through a low energy mechanism and, of these, 81% to 95% represent a stable fracture pattern.^{5,6}

As one would expect with any fragility fracture, the incidence of pelvic insufficiency fractures is age related. Melton and colleagues⁵ reported on the incidence of pelvic fractures during a 10-year period in Rochester, Minnesota. The investigators noted an overall incidence of 37/100,000 person years; however, in men aged between 75 and 84 years the incidence was 63.9/100,000 and in women the incidence was 249.5/100,000. In men and women aged 85 years or greater, the incidence was 220.3/100,000 person years and 446.3/100,000 person years, respectively. The incidence of pelvic fractures continues to rise with the aging of our world population as a whole. Parkkari and colleagues³ reported on osteoporotic pelvic fractures in Finland from 1970 to 1991 citing an increase from 18% of all pelvic fractures in 1970 to 52% in 1991. They also noted a rise in the proportion of patients older than 60 years from 28% in 1970 to 62% in 1991. Kannus and colleagues⁷ noted that incidence of pelvic fractures in patients aged 60 years or older increased by an average of 23% per year from 1970 to 1997. Using these data, the investigators projected the number of pelvic insufficiency fractures per year would triple by year 2030.

Acetabulum fracture epidemiology

Acetabulum insufficiency fractures represent a significant subset of pelvic fractures whose incidence is also increasing. Ferguson and colleagues⁸ reported on a consecutive series of operative acetabulum fractures from 1980 to 2007 and demonstrated a 30% increase in the proportion of acetabulum fractures in patients older than 60 years. About 49.8% of these fractures were the result of a low energy ground-level fall. In a 10-year analysis of pelvic fractures treated in Skarborg County, Sweden, a 10% incidence of acetabulum fractures occurred in patients older than 60 years.⁶ Boufous and colleagues⁹ noted a 11% incidence of acetabulum fractures in their series of geriatric pelvis injuries.

Morbidity and mortality statistics

Pelvic insufficiency fractures are associated with decreased mobility, loss of independence, and significant mortality. In a series of 148 patients aged 65 years or older with a closed pelvic fracture (83% due to low energy trauma), 51.1% required personal assistance for mobility and all patients required device assistance for ambulation at time of discharge.¹⁰ The inability to safely ambulate after sustaining a pelvic fracture makes it especially difficult for the geriatric patient to return home from the hospital.

Breuil and colleagues¹¹ evaluated outcomes of 60 patients hospitalized with a new pelvic insufficiency fracture and noted 52.5% of patients suffered an adverse event during hospitalization, mainly urinary tract infection, pressure ulcer, cognitive alteration, or thromboembolic event. Furthermore, although 82.5% of the cohort was living autonomously before injury, only 31% returned home on discharge, whereas 3.4% were institutionalized and 65.6% discharged to a geriatric in-patient setting. At time of last follow-up almost 50% of the patients in this series had lost autonomy. Taillandier and colleagues² reviewed 10 years of pelvic insufficiency fractures at a single

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