

On the classification, epidemiology, and outcome of acetabular fractures

AKADEMISK AVHANDLING

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i Hörsal aulan, R-huset, Sahlgrenska Universitetssjukhuset, Mölndal, den 7:e mars 2025, klockan 9.00

av Madelene Albrektsson, Leg. läkare

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Avhandlingen baseras på följande delarbeten

- I. Albrektsson M, Wolf O, Enoeson A, Sundfeldt M. Validation of the classification of surgically treated acetabular fractures in the Swedish Fracture Register *Injury* 2022;53:2145-2149
- II. Albrektsson M, Möller M, Wolf O, Wennergren D, Sundfeldt M. Acetabular fractures: Epidemiology and mortality based on 2,132 fractures from the Swedish Fracture Register *Bone Jt Open* 2023;4(9):652-8.
- III. Albrektsson M, Möller M, Sundfeldt M, Wennergren D, Wolf O, Bergdahl C. Patient-reported outcome following an acetabular fracture: an observational study of 385 patients from the Swedish Fracture Register *Acta Orthopaedica* 2024;95:695–700.
- IV. Albrektsson M, Möller M, Sundfeldt M, Wennergren D, Wolf O. Secondary surgery and mortality following primary treatment for acetabular fractures – an observational study from Swedish national quality registers *Submitted*

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



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Abstract

Acetabular fractures were traditionally managed non-surgically, largely due to the absence of effective surgical methods. Since the 1960's, the field of acetabular fracture surgery has undergone rapid advancements. The Judet/Letournel classification system and analysis of these fractures have been widely disseminated and embraced by acetabular surgeons worldwide. Advancements in surgical techniques, radiographic imaging, and implant technology have broadened the spectrum of treatment options. An ageing, more active population has increased the demand for treating complex fractures in osteoporotic bone, placing a greater burden on the treating surgeon. Recent advancements and evolving treatment methodologies warrant continued investigation of this patient cohort. This thesis aims to contribute to understanding the classification, epidemiology, and treatment outcomes of acetabular fractures using data from the Swedish Fracture Register (SFR). The SFR contains a large cohort of acetabular fracture patients that have yet to be studied and presented.

Study I in this thesis is a validation study to assess the accuracy of the fracture classification in the SFR and concurrently evaluate its practical utility. The findings of this study demonstrate a moderate level of concordance with the established gold standard, a level deemed acceptable for scientific reporting. However, cautious interpretation is advised for specific fracture types. Study II is an epidemiological study providing one of the largest cohorts of acetabular fractures (n=2,132) and includes non-surgically and surgically treated patients. This study shows that the typical patient sustaining an acetabular fracture is >70 years of age, male, and has experienced a low-energy trauma event. The mortality after an acetabular fracture is comparable to the well-known high mortality following hip fractures. Studies III and IV focus on the outcome after the trauma event. Study III reports clinical results on patient-reported outcome measures (PROMs) and confirms the presence of functional impairment in all patient groups 1-year post-injury. Study IV presents findings related to therapeutic failure and subsequent surgical intervention requirements. Following a five-year period, 17% of patients treated with open reduction and internal fixation (ORIF) for acetabular fractures required a secondary arthroplasty procedure.

Keywords: acetabular fracture, register, classification, validation, epidemiology, mortality, patient-reported outcome, secondary surgery, reoperation

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