

Diabetes Comorbidity Increases Complication Risk in Traumatic Thoracic Vertebral Fracture Repair: A Propensity Score Matched Analysis

Joshua Loewenstern; Remi Aria Kessler; John M. Caridi MD

Department of Neurosurgery, Icahn School of Medicine at Mount Sinai, New York, NY


**Icahn
 School of
 Medicine at
 Mount
 Sinai**

Introduction

Thoracic vertebral fracture repair after a traumatic injury can be associated with a significant risk of postoperative complications. However, surgical outcomes can be complicated by patient comorbidity, particularly diabetes mellitus, which can arise from several modifiable and non-modifiable risk factors. This study aims to compare postoperative clinical outcomes and complication rates for traumatic thoracic vertebral fractures in a large, risk factor-matched sample of diabetic patients and non-diabetic controls.

Methods

Patients with a surgical repair of a trauma-induced thoracic level vertebral fracture treated from 2010 to 2015 were identified from the Trauma Quality Improvement Program (TQIP) database yielding 5,557 cases for analysis. Patients with a comorbid diabetes diagnosis were matched through a propensity score matching (PSM) technique with non-diabetic patients on age, race, and body type and compared on postoperative complications and clinical outcomes.

Results

Prior to PSM, the diabetic patient group was older on average and had a greater proportion of obese patients ($p < 0.001$). After PSM, each group consisted of 544 patients (overall $n = 1,088$) and no longer differed by any baseline characteristic. Comorbid diabetes was associated with a longer average length of hospital stay and a greater frequency of several major and minor postoperative complications ($p < 0.05$), including prolonged intensive care, pneumonia, acute renal failure, stroke, pressure ulcers, and urinary tract infections, but no differences were found in re-operation rates or in-hospital mortality (Figure 1).

Conclusions

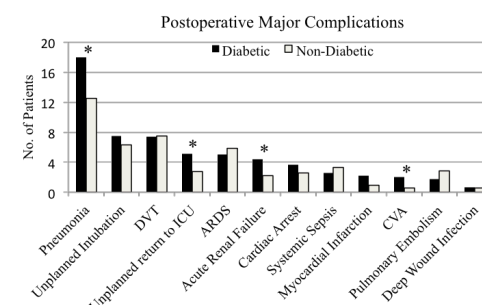
Diabetes as a comorbidity can significantly increase the risk of postoperative complications after traumatic thoracic vertebral fracture repair, which may lead to delayed recovery and greater health care-related costs. This finding is an important consideration for surgical decision-making and patient counseling on treatment options with this comorbid condition.

Learning Objectives

- 1) Identify several postoperative complications that were associated with diabetes comorbidity such as prolonged intensive care, infection, renal failure, and longer hospital length of stay.
- 2) Discuss the benefits of propensity score matching patients based on factors predisposing patients to one group or another when randomization cannot be performed.
- 3) Consider the increased risk of postoperative complications for patients with comorbid diabetes in the management of traumatic thoracic vertebral fracture repair.

References

1. Marre B, Ballesteros V, Martinez C, et al. Thoracic spine fractures: injury profile and outcomes of a surgically treated cohort. *Eur Spine J.* 2011;20(9):1427-1433
2. Takahashi S, Suzuki A, Toyoda H, et al. Characteristics of diabetes associated with poor improvements in clinical outcomes after lumbar spine surgery. *Spine (Phila Pa 1976).* 2013;38(6):516-522.

Figure 1.


Comparisons of major complications incurred after traumatic thoracic vertebral fracture repair by diabetes comorbidity group. DVT = deep vein thrombosis, ICU = intensive care unit, ARDS = acute respiratory distress syndrome, CVA = cerebrovascular accident. * $p < 0.05$