

Odontoid Type II Fractures In The Elderly - Complications And Mortality

Trauma / Spine Trauma / Epidemiology, Prevention & Diagnosis

Hassaan Qaiser Sheikh, Arpan Doshi, Lee Breakwell, Neil Chiverton, Ashley Cole, Michael Athanassacopoulos, Antony Louis Rex Michael

Sheffield Teaching Hospitals, Sheffield, United Kingdom

Keywords: Odontoid Peg, Fracture, Elderly, Mortality, Complications, Epidemiology

Background

Odontoid peg fractures comprise up to 15% of all spine injuries. The majority of these injuries are type II injuries. These are commonly sustained in the elderly following low energy trauma and concomitant neurological injury is uncommon. These patients are admitted under spine surgery for further management. Management tends to be non-operative to achieve fracture stability through osseous or fibrous union. There is little in the published literature, however, about the short to medium term mortality following this injury.

Objectives

We analysed the complications and management of this injury referred to our Level 1 Trauma Centre and regional spinal surgery centre. Additionally, we evaluated the 30-day and 90-day mortality rates and causes of death in these patients.

Study Design & Methods

Institutional board approval was gained prior to data collection. We retrospectively analysed prospectively collected data over a 6 year period to identify all consecutive patients referred with a type II odontoid peg fracture to our unit. The only exclusion criterion was age less than 65 years. All patient images were reviewed. Hospital databases and case notes were searched for all patient demographics and co-morbidities at the time of referral. We collected data on treatment of the injury, other injuries, neurological status, date of death and cause of death. Concomitant injuries were coded into Injury Severity Score (ISS) to aid interpretation. Similarly, co-morbidity data was also coded to calculate a Charlson Co-Morbidity Score (a co-morbidity score previously validated for mortality in hip fracture patients). Patient notes were reviewed for all clinic follow up visits, neurological injury and any other complications.

Statistical analysis included sequential univariate then multivariate Cox regression analysis to identify any risk factors significantly associated with early mortality.

Results

101 patients were included in this study. 91 were treated non-operatively in cervical orthotic and 10 were treated with operative intervention. Those treated operatively included two patients who underwent halo fixation followed by occipito-cervical fusion and eight patients who underwent primary occipito-cervical fusion. Reasons for operative intervention included significant displacement, pathological fractures and neurological deficit. Four patients had neurological disability following injury including central cord syndrome and Brown-Sequard syndrome.

30-day mortality was 9.9% and 90-day mortality was 15.8%, strikingly similar to mortality following hip fractures, perhaps reflecting similar patient demographics. Following statistical analysis, the only risk factor directly associated with both 30- and 90- day mortality was advancing age ($p=0.002$). Increasing Charlson score ($p=0.222$) and ISS ($p=0.100$) were non-significantly associated with early mortality. The commonest causes of death included pneumonia, acute coronary syndromes and malignancy.

Conclusions

We have analysed and identified specific risk factors associated with early mortality following this injury. Given the low rate of neurological complication and surgical intervention, we propose that these frail patients be triaged at admission to a medical ward to optimise their care with consultation, and if required, outpatient follow-up with spine surgery. This will ensure that these patients are ideally placed under physician led care for their multiple medical co-morbidities with surgical input as required.