



# SPINAL FRACTURES IN MALTA OVER ONE YEAR

## INTRODUCTION

Spinal fractures, particularly those associated with spinal cord injuries, give rise to significant morbidity and mortality.<sup>1</sup> Early recognition and adequate management are paramount to minimize the two. This descriptive study reviews the cases diagnosed with a vertebral fracture at the Accident and Emergency Department over a one year period including the patients' demographic characteristics and looks into the management instituted. It also highlights the factors which may be associated with a prolonged hospital stay.

## METHODOLOGY

Permission to carry out this study was sought from and granted by the Data Protection Officer at Mater Dei Hospital and the consultant caring for these patients. Cases of vertebral fractures were identified by reviewing the reports of spinal imaging requested at the Accident and Emergency Department

from September 1, 2010 to September 1, 2011. Information was then collected retrospectively from the patients' files and discharge letters. This included general demographic data, the mechanism of injury (MoI), level of fracture/s, presence of neurological deficit, other associated injuries or patients' comorbidities, treatment type and length of hospital stay. The information was coded, entered into a MS Excel spreadsheet and analysed using SPSS v.20.

## RESULTS

There were 71 cases of spinal fractures over the one year period. Forty-two (59.15%) were males and 29 (40.85%) were females, with the most prevalent age group being 21-30 years (18 patients, 25.35%), followed by the 61-70 age group (15 patients, 21.27%). Mean age was 47.46 years. The highest number of vertebral fracture admissions took place in February and August, when there were 10 cases in each of these months. December had the lowest number of such admissions: only 2 patients.

Seventy patients had a traumatic MoI, while only one had a fracture which was pathologic in origin. The commonest trauma causing a vertebral fracture was a fall from height of more than 2 metres (20 cases, 29.58%). A fall from height less than 2 metres was the MoI in 9 patients (12.68%) while a fall from own height, sea-related injuries and a motor vehicle accident accounted for 10 cases (14.08%) each. Another 11 patients had miscellaneous MoIs. The pathologic fracture case was diagnosed as multiple myeloma on subsequent investigations.

Neurological deficit was present in only 7 cases (9.86%). Nineteen patients (26.76%) had other injuries associated with the fracture and 38 patients (53.52%) had one or more comorbidities. The commonest comorbidities were cardiovascular (29.03%).

Fifty-seven cases (80.28%) were managed conservatively: 22 (30.99%) without a brace, 33 (46.48%) with a brace and two (2.82%) with traction and a brace. Thirteen patients (18.31%) were treated operatively and in most (12 patients) this was carried out using a posterior approach. Mean length of hospital stay was of 8.9 days, with a range of 1 to 89 days. The commonest length of stay (the mode) was of 3 days and 52.1% were hospitalized for 5 days or less.

Fifteen patients (21.13%) had fractures at more than one level, totalling 95 fractures in all subjects. Of these, most fractures

were thoracolumbar (levels Th10 to L2) with 60 fractures (68.84%), followed by lumbar (L3 to L5) with 17 fractures (17.89%) and cervical (C1 to C7) with 16 fractures (16.84%). There were only 2 (2.11%) thoracic fractures (T1 to T9).

The AO (Arbeitsgemeinschaft für Osteosynthesefragen) system of vertebral fractures was used to classify the injuries. However, this system classifies fractures of the vertebral body fractures of the thoracolumbar region only, so 24 fractures were excluded (25.26%): 4 pathologic in origin (in the multiple myeloma patient), 4 which involved parts of the vertebrae other than the body, and the cervical fractures. Of the remaining 70 fractures, 66 involved the vertebral body only: 47 A1 (wedge) fractures (49.47%), 7 A2 (split) (7.37%) and 12 A3 (burst) (12.63%). The other 5 injuries (5.26%) extended to both the vertebral body and adjacent bone structures.

The data was analysed using SPSS v.20 using a 95% confidence interval to correlate various factors with the length of hospital stay. Mean length of hospital stay was higher for males (9 days), the 51 to 60 age group (13 days), patients whose MoI was a motor vehicle accident (12 days), those who had a neurological deficit (15 days) and patients who were treated operatively (12 days). However, none achieved statistical significance.

## DISCUSSION

In the cohort investigated above, vertebral fractures were commoner in males and in people at both ends of age distribution. The mean age of 47.46 years was similar to that in a European cohort (45.5 years) but in the latter a larger proportion of men were affected (64.9%).<sup>1</sup> This was also true in China where the male-to-female ratio was of 2.33:1.<sup>2</sup>

The study identifies trauma as the leading cause of vertebral fractures, with falls accounting for more than half of the cases. Associated injuries were also present in more than half the patients, however, neurological deficit was uncommon. This highlights the importance of environmental health and safety,

especially at the workplace and in public places. In contrast, the main cause in European and Chinese cohorts was road traffic accidents (36.08% of vertebral fracture-dislocations in the first<sup>1</sup> and 33.61% of spinal trauma in the second<sup>2</sup>). Associated injuries in European cases occurred at 45%, similar to the findings in this study.<sup>1</sup>

The conservative management employed in most patients possibly allowed for the short hospital stays observed. Those treated operatively stayed in hospital for an average of 12 days, which is higher than the mean length of hospital stay. However, this was not found to be statistically significant.

Operative management involves stabilizing the fracture through either a dorsal approach or, less commonly, a ventral approach. Surgery carried out dorsally is either a posterior fixation or an ultra-short posterior fixation. In the former the screws are inserted into the vertebrae above and below the fracture while in the latter, instrumentation is applied to the fractured vertebral body and the one above it only. The fourth operative option is a corpectomy, involving removal of the fractured vertebra and replacement with bone graft. This was not done on any patient in this cohort.

The AO system used to classify the fractures broadly separates fractures into three types, depending on the mechanism of injury. These are compression fractures (type A), distraction fractures (type B) and multidirectional with translation fractures (type C) and each category is further sub-classified.<sup>3</sup> In this study, the most prevalent fractures were type A, where the integrity of the bone and soft tissue structures is retained, possibly explaining how conservative management could be opted for to such an extent and why very few patients had neurological deficit.

The main limitation of this study is the small cohort involved because this made it difficult to prove any statistically significant correlation between length of hospital stay and other variables. However, it provides a valuable study tool to retrospectively investigate vertebral fractures. Also, the results shown above provide an insight into the characteristics of the patients affected and the causes and management trends of vertebral fractures. ❄️



**THE STUDY IDENTIFIES TRAUMA AS THE LEADING CAUSE OF VERTEBRAL FRACTURES, WITH FALLS ACCOUNTING FOR MORE THAN HALF OF THE CASES**

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**ERRATA CORRIGE.** The contribution *Spinal Fractures in Malta Over One Year*, published in the last issue, Issue 1/14, has been erroneously attributed to both Drs Glenn Abela and Paul Calleja. The sole author was in fact Dr Glenn Abela. The error is regretted.

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