

The Pattern of Pelvic Fractures in Asir Region of Saudi Arabia

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Aim: The aim of this study is to review two hundred cases of pelvic ring fractures, acetabular fractures and dislocation of hips seen in Asir Central Hospital over a six-year period from 1409H (1989) to 1415H (1995) and to see how it correlates with the pattern seen in other parts of the world. In the review emphasis is laid on associated injuries, causes of the injury, the most common type of pelvic ring fractures and the most common type of acetabular fractures seen.

Methods: Data were gathered from the case notes of all admissions and transfers to this hospital of all patients with pelvic fractures during the period of study. All the relevant roentgenograms were retrieved and re-studied for the purpose of classification of the pelvic ring and the acetabular fractures.

Results: Male-female ratio was 5.1:1. The average age was 30.7 years. The most common associated injuries were fractures of bones of the lower extremities and head injury. Road traffic accident was the most common cause of pelvic fracture followed by fall from height. Most common type of pelvic fracture was pelvic ring injuries without acetabular fractures followed by type A injuries (stable ring injuries). The most common acetabular fracture was type A followed by type B injuries. With the exception of one case, all the hips dislocations were posterior dislocations.

Conclusion: Road traffic accident is the most common cause of pelvic fractures in Asir region of Saudi Arabia. The most common associated injury is the fracture of bones of the lower extremities. The most common type of pelvic ring fractures seen is stable type A, and the most acetabular fracture seen is type B.

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Traumatic disruption of pelvic ring has become a major focus of interest because it is usually due to a high energy injury and frequently associated with damage to many organ systems of the body^{1,2}.

Asir Central Hospital in Saudi Arabia was commissioned in 1988 (1408H) to serve as a referral center for about 218 health institutions in Asir region, and to serve as a Teaching Hospital to King Saud University, College of Medicine. The population of Asir region is about 1,200,000 and it covers an area of about 80,000km in the South-Western part of Saudi Arabia³. Because the pattern of pelvic fracture in this area has never been studied it is therefore decided to study this to find out how it correlates with the pattern common in other parts of the world.

METHODS

The case notes of all admissions and transfers to the hospital with documented pelvic fractures were studied. The period extended from 1989 to 1996 (02/02/09H to 12/05/15H), a period of about six years. Seven of the cases seen during

this period with incomplete data and information were eliminated. The remaining two hundred cases were studied with regards to age group distribution, sex, nationality and the type of pelvic fracture. Associated injuries and the nature of injury causing the fracture were also noted. All the roentgenograms were retrieved and re-studied for the purpose of classifying the type of pelvic fracture. Pelvic ring fractures without acetabular fractures were classified according to Tile⁴. The acetabular fractures were classified according to Letournel and modified by the AO group^{4,6}.

RESULTS

Of the two hundred cases analysed during this six-year period from 1409H (1989) to 1415H (1996), 167 were males and 33 females, a male to female ratio of 5.1:1. The non-Saudis were 54 and the Saudis 146, a non-Saudi to Saudi ratio of 1:2.7 in a population where non-Saudi to Saudi ratio is 1:3³. The highest incidence occurred in the 3rd decade, 59 (29.5%) cases, followed by the fourth decade 43 (21.5%) cases. The average age of all patients was 30.7 years. Patients with associated injuries were 131 (65.5%) and those with isolated pelvic fracture were 69 (34.5%). Road traffic accident was the most common cause of pelvic fracture with

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170 (85%) cases. Fall from height occurred in 21 (10.5%) cases. Only 5 (2.5%) cases resulted from tripping. Of these five cases one was a 70 year old man and the remaining four were women aged 90, 65, 60 and 45 years with some degree of osteoporosis.

Of the 171 road traffic accident cases, one case was due to motor cycle accident, the others were due to automobiles. Twenty four (14.0%) pedestrians were hit by automobiles and 108 (63.2%) were drivers of the automobiles involved in the accident. Thirty one (18.1%) passengers were sitting in front and 7 (4.1%) were in the back seat.

The most common associated injuries were fractures of the bones of the lower extremities, 44 (21.0%) cases, followed by head injury, 43 (20.6%) cases, and thoracic injury 38 (18.2%) cases. The thoracic injuries sustained were fractured ribs, pneumo-haemothorax, fractured clavicle and fractured scapula. There were only 12 (5.7%) cases of bladder and urethral injuries and 10 (4.8%) cases of abdominal haematoma.

The pelvic ring injuries without acetabular fractures occurred in 127 (63.5%) patients, and type A injuries (stable ring injuries) occurred in 71 (55.9%) patients. Type B (rotationally unstable injuries) occurred in 41 (32.3%) patients; type C injuries (rotationally and vertically unstable) occurred in 15 (11.8%) patients.

For acetabular fractures there were 60 (30%) patients in the whole series. There were 26 (43.3%) patients with type A acetabular fracture involving only one wall of the acetabulum. There were 30 (50%) patients with type B injuries. There were 4 (6.7%) patients with type C injuries. Out of the 60 patients with acetabular fractures, 4 patients had disruption of the pelvic ring with rotational and vertical pelvic ring instability; one patient with rotational pelvic ring instability and nine patients had pelvic ring injury involving mainly the pubic rami. In these cases of acetabular fractures there were 29 (48.3%) cases of hip dislocation and 4 (6.7%) cases of associated hip subluxation.

Thirteen (6.5%) patients had hip dislocation but without acetabular fractures. All of these were posterior dislocations except in one patient who had a bilateral dislocation in which one hip dislocated anteriorly and the other posteriorly. Three femoral heads were fractured⁸.

DISCUSSION

The pattern of pelvic fracture as seen in Finland is very much different from what we see here. A report showed that the female to male ratio was 2.9:1 in patients who were over 49 years of age, while in younger age group the ratio was 0.5:1⁹. Half of their cases were pubic fractures. In half of the cases the mechanism of injury was a fall, and in one quarter, a road traffic accident. A report from the United States also showed that the most common causes of pelvic fractures are automobile and motor cycle accidents, followed by pedestrian accidents and falls from great height¹⁰. In this series the female to male ratio was 1:5.1, and the most common type of pelvic fracture seen was Type A pelvic ring fracture. Road traffic accident was the most common cause here, 85% and pelvic fracture due to a fall

from great height was only 10.5%. Tripping was a mere 2.5%, a distant third. One main reason for the wide difference in sex distribution in this series is because women do not drive in this country and culturally, are expected to live a sedentary life. Significant external forces are required to fracture a normal pelvis, therefore, because the forces usually result from deceleration or crushing injuries, energy is often delivered to multiple anatomic sites resulting in associated injuries¹¹.

In a report on urethral injury in pelvic fractures 19% of patients were shown to have urethral injury and 2.5% bladder injury¹². However in this series only 5.7% had bladder and/or urethral injury. The difference can be explained on the basis of the fact that the highest risk of urethral injury in pelvic fracture occurs in straddle fracture when combined with diastasis of the sacroiliac joint whereas in this series the most common type of pelvic fracture seen is Type A of the ring¹². Others have also reported that pelvic fracture was associated with genito-urinary tract injury in 50% of cases in the paediatric age group¹³.

Even though there was no case of fatal bleeding in this series, others have reported severe vascular injury associated with acetabular fracture¹⁴⁻¹⁶.

One of our patients was a 2 year old child with paraplegia following pelvic fracture. It has been shown that sexual dysfunction such as impotence can occur in about 62% of pelvic fracture and that the disruption of the carvenosal nerves lateral to the prostatomembranous urethra behind the symphysis pubis is the most likely cause of impotence in this injury¹⁷. In this series, of the 171 road traffic accident, 24 (14.0%) patients were hit by automobiles. It has been shown that pedestrians struck by motor vehicles have the highest mortality and morbidity rates of all motor-vehicle trauma. The most common injury is the fracture of tibia and fibula followed by fracture of the pelvis¹⁸. This report shows that road traffic accident was responsible for most of the pelvic fractures seen in this region and this reinforce a previous report from this same institution that showed that road traffic accident was the most common cause of death seen in the Emergency room in the same hospital¹⁹. This underscores the importance of vehicular accident in Asir region of Saudi Arabia

CONCLUSION

In Asir region of Saudi Arabia, pelvic fractures occur mainly in men in the 3rd and 4th decades of life. Road traffic accident is the major cause of this and the most common associated injury is the fracture of bones of the lower extremities.

The most common type of pelvic ring fractures seen is staple type A and the most acetabular fracture seen was Type B^{20,5}.

On the basis of this study steps that will reduce vehicular accidents such as enforcement of speed limit, adequate driving lessons and prevention of underage boys from driving should be enforced. Also, even when accidents do occur, the severity of such can be reduced by enforcing the use of seat belt, and making sure all automobiles imported into the country have air bags as standard equipment.

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