

CASE REPORT

Management of severe pelvic injury following road traffic accident in a resource-limited setting

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A 34 year old woman involved in road traffic accident with severe anterior and posterior pelvic fractures with associated soft tissue injury was referred from Wa Regional Hospital 18 hours after the accident to Tania Specialist Hospital in Tamale. Emergency resuscitative measures such as catheterization and management of pain with analgesics were initiated. Computed topography (CT scan) or Magnetic resonance imaging has been recommended as the appropriate tools for risk assessment in such cases however none of this was available at the time of the accident. The only assessment tool available was the C-arm machine which was used to X-ray the pelvis in the following plane; antero – posterior pelvic - inlet and pelvic – outlet. Early internal reduction and stabilization of pelvis was immediately carried out using the procedure of open reduction and internal fixation (ORIF). Approximately 2 weeks after the operation, radiographs showed signs of healing and the patient was discharged on partial body weight bearing. Upon second review 12 weeks post operatively, complete recovery was accomplished.

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INTRODUCTION

Pelvic fractures are severe injuries associated with varied morbidities. Mortality rates range from 10% to 50% depending on the severity of pelvic fracture, bleeding and the presence of associated injuries to the brain, thorax and abdomen (T'ile, 1988; Dalal *et al.*, 1989; Gonzalez *et al.*, 2002).

Treatment options have increased from simple pelvic slings and postural reduction to more complex internal and external fixations (Pohlemann *et al.*, 1994). Early effective management of severe pelvic trauma with modern medical devices such as CT-scan and MRI and techniques contributes significantly to survival to these patients (Ghanayem *et al.*, 1995; Durkin *et al.*, 2006). Computed topography and magnetic resonance imaging have been shown to be a very sensitive means of detecting pelvic fracture and associated injuries that often accompany pelvic fracture

and have become indispensable in the care of these patients. However in places where such modern medical devices are unavailable or inadequate, effective treatment may be compromised. This report presents the management of severe anterior and posterior pelvic fractures with associated soft tissue injury following road traffic accident with the aid of C arm machine in a resource limited setting.

CASE REPORT

A 34 year old woman reported to the Tania Specialist Hospital situated in Tamale, the Northern Regional capital of Ghana upon referral from the Wa Regional Hospital in the Upper West region 18 hours after a road traffic accident with severe waist pain, inability to sit, stand or urinate. No history of loss of consciousness, amnesia and headache was reported but the patient complained of severe waist pain. There was no clinical evidence of abdominal, chest or head injuries. The patient had a soft and tender lower abdominal mass, about the size of a 16 weeks pregnancy and was moderately pale. Pelvic compression tenderness was positive both laterally and antero-posteriorly. Upon examination of the

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lower limbs, power in the left leg was grade 1 with a proximal one-third loss of sensation and that in the right leg was grade 4 with no sensory loss. Ankle and foot pulses were intact.

Radiological examination using Ultrasound revealed a full urinary bladder which was emptied by catheterization. No other abdomino-pelvic organ abnormality was detected. The pelvis was x-rayed in the antero-posterior plane as well as pelvic - inlet and pelvic - outlet planes. Diagnosis of the AO Type-C pelvic fracture with neurological deficit in the left leg (Butterfly-like anterior pelvis and left Malgaigne fracture), compressed bladder and left monoplegia were made (Figure 1).

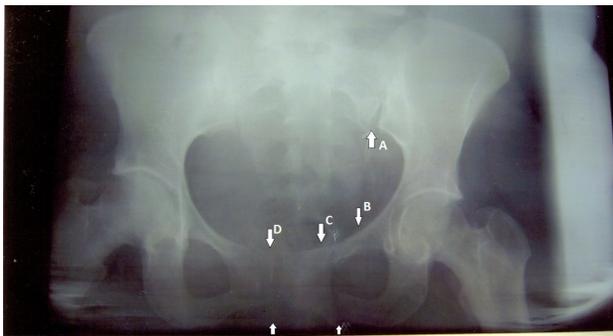


Figure 1: Pre-operative pelvic X-ray (A-P view); (A) dislocation of the sacroiliac joint; B, C, D, E shows butterfly-like fracture of the pelvis.

Prior to surgery, the patient's blood haemoglobin level was 8.0 g dL^{-1} and as such was pre-operatively haemo-transfused with compatible whole blood. An open reduction and internal fixation (ORIF) operation on the anterior pelvis and intra-operative manual reduction of the dislocation in the left sacro-iliac joint was conducted on the patient (Figure 2).

Post-operative recovery was excellent, urethral catheter was removed after 72 hours and on the 4th post-operative day, sensation and power in the legs were almost completely restored and patient started to walk with the aid of shoulder crutches. All stitches were removed on the 8th post-operative day.

Two weeks following the operation the patient was discharged and was reviewed after six weeks (Figure



Figure 2: Post-operative X-ray film of the pelvis after internal reduction and fixation

3) and a second review 12 weeks post-operatively. By the twelfth week, the patient was able to walk without crutches and pelvic/vaginal examination showed adequate stability of the pelvic girdle.



Figure 3: X-ray showing healed fractures (6 weeks after operation)

DISCUSSION

Fractures of the pelvic ring have been reported to comprise 2% to 8% of all skeletal injuries and are often associated with high-energy trauma, most commonly, motor vehicle accidents and falls from a height (Pennal *et al.*, 1979; Burgess *et al.*, 1990). Studies have shown that vehicular accident such as vehicles crashing into pedestrians, passengers being thrown out of moving vehicles, causes about 60% of pelvic fractures (Inaba *et al.*, 2004; McCormack *et*

al., 2010). Among multiply injured patients with blunt trauma, about 20% have pelvic injuries (McCormack *et al.*, 2010). The incidence of pelvic fracture appears to be increasing secondary to increases in the number of high-speed motor vehicle accidents and the number of patients surviving these accidents due to airbags and safer car designs (Poole and Ward, 1994). In Northern Ghana the incidence of complex fractures including pelvic injuries are on the rise due to the poor state of the roads, indiscipline road users poor vehicle maintenance culture and over-aged vehicles (Afukaar *et al.*, 2003).

In the management of pelvic fracture, Pohlemann *et al* (1994) advocates stabilization of the sacro-iliac joint with ORIF (plates and/or screws). However this patient recuperated very well without the posterior pelvic ORIF. The early mobilization of the patient from 4th post-operative day may have prevented further complications such as development of thromboembolism.

The fundamental challenge for clinicians evaluating and managing patients with pelvic fracture in resource limited settings in Africa is the determination of immediate threats to life and to control such threats (Inaba *et al.*, 2004). Approaches to treatment vary depending on whether the main threat arises from pelvic fracture hemorrhage, or associated injuries, or both. The long term functional outcomes depend on the quality of the rigid fixation of the fracture, as well as management of associated pelvic neural and visceral injuries. Use of modern imaging technologies like CT-scan, MRI and C-Arm X-ray is essential for the achievement of quality management (Poole and Ward, 1994; Durkin *et al.*, 2006). The absence of some of this equipment in Northern Ghana complicates appropriate management of severe pelvic injury cases. The lack of CT-scan/MRI in Northern Ghana explains why investigations of posterior pelvic structures were not done prior to surgery in this case. Effective management of pelvis fracture is very critical to future economic and social activity of the patient especially in women of reproductive age since improper management may hamper vaginal delivery in such women although a history of pelvic fracture does not exclude vaginal delivery.

CONCLUSION

In resource limited settings such as Northern Ghana effective management of severe pelvic fracture with good functional outcome is possible even without the appropriate modern medical equipments such as CT scan and MRI which have been stated as indispensable in such cases.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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