CASE REPORT

Surgical emphysema over the pelvis: an unusual physical sign found on primary survey

J Lim, K M Porter

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Open fractures of the pelvis are associated with high energy trauma and present a challenge to successful management and sometimes, early and correct diagnosis. These patients require more aggressive blood resuscitation particularly in the first 24 hours, repeated wound care operations, and often require a diverting colostomy. Usually these pelvic fractures can be distinguished from closed pelvic fractures by an open wound or lacerations of the vagina and rectum. Occasionally, however, the wounds associated with these fractures may remain undetected and the severity of the injury underestimated until complications develop. The authors believe this to be the first report of subcutaneous surgical emphysema associated with an open pelvic fracture.

CASE REPORT

A 27 year old female pedestrian who had been struck by a motorcycle travelling at approximately 40 mph presented to the accident department with a large scalp laceration and an obvious left thigh deformity.

On arrival there were no airway or breathing problems. External haemorrhage from the scalp wound had been controlled by direct pressure and splintage applied to her left leg. The blood pressure was 130/100 mm Hg and pulse rate 140/min. Her Glasgow coma score was 14 with normal pupillary signs. Patient exposure revealed no other injuries.

Surgical emphysema was noted as an isolated finding over the right iliac fossa and iliac crest when, under the circulatory component of the primary survey the abdomen was assessed for tenderness and the pelvis for instability.

Secondary survey revealed a small perineal laceration. There was no vaginal bleeding. A log roll was performed and a rectal examination revealed no blood or palpable bony fragments.

Pelvic radiographs showed comminuted fractures of the superior and inferior pubic rami with pubic diastasis and fracture of the acetabulum. In addition, subcutaneous air overlying the right iliac crest was visible.

Computed tomography showed no intra-abdominal injury. There was a large right sided pelvic haematoma with air in the soft tissues that displaced other structures to the left side. Surgical emphysema was noted in the perineum extending up to the right side of the pelvis into the flank region. Complex fractures of the right ischium and pelvis with diastasis and comminution of the acetabulum were also identified (fig 1).

The right pelvic fracture precluded intramedullary nailing and therefore, the femoral fracture was treated by compression plating. Assessments were also performed by a general surgeon and a gynaecologist in theatre. There were no obvious vaginal or anorectal injuries but in the perineum, at the eleven o'clock position, there was a paraurethral wound that led into a large cavity containing comminuted fractures of the right

Figure 1 CT scan showing subcutaneous surgical emphysema over the right side of the pelvis and iliac fossa.

pubic rami. The cavity was packed to arrest bleeding. A decision was made by the general surgeons not to undertake a diverting colostomy.

The patient remained stable postoperatively. Two days later the cavity was inspected and found to be dry. Subsequently the pack was changed to a corrugated drain and she underwent eight dressing changes under anaesthesia before wound management on the ward. The wound healed within five weeks. Progressive weight bearing was started beyond the 12 week mark and she proceeded to make a full recovery in terms of hip function and gait.

DISCUSSION

Four per cent of pelvic fractures are open fractures communicating with the skin, the vagina or the rectum and these injuries are often associated with significant morbidity and mortality.¹ Additional injuries are present in most of these patients and a mean Injury Severity Score of 30 has been reported.² The early diagnosis of an open pelvic fracture should prompt realisations of the severity of the injury and allow preparations to be made for multi-disciplinary treatment required. Open pelvic fracture patients require more aggressive blood resuscitation particularly in the first 24 hours, repeated wound care operations and often require a diverting colostomy to avoid septic complications.¹

Kumar *et al* reported intrapelvic and extrapelvic surgical emphysema associated with major pelvic disruption on computed tomography of the pelvis but there are no reports of subcutaneous surgical emphysema in the English literature.³

Lacerations in open pelvic fractures may be caused by several methods:

- 1 tensile forces across the skin of the perineum
- 2 crush injuries which also cause tears of the skin

- 3 lateral compression injuries with resulting epithelial penetration by fractured bone
- 5 direct impact or penetration by an object

Surgical emphysema in the context of trauma is usually seen in the neck or the upper trunk and associated with pneumothoraces, tracheal bronchial disruption or penetrating injuries. The unusual site of surgical emphysema over the right iliac crest, the position of the perineal laceration, the fractures sustained and the direction of the cavity suggests, in this case, a penetrating injury by part of the motorcycle.

This case illustrates an unusual finding in the primary survey, which led to an early diagnosis of an open pelvic fracture, blood replacement, antibiotics, further investigations, and treatment.

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Authors' affiliations

J Lim, K M Porter, Selly Oak Hospital, Birmingham, UK

Correspondence to: Mr K M Porter, University Hospital Birmingham NHS Trust, Selly Oak Hospital, Raddlebarn Road, Birmingham B29 6JD, UK

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