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Can A Traumatic Bladder Injury be Fatal: A Case Series of 8 Patients

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Abstract

Objective: Bladder injuries can be fatal if mismanaged. We report a small series of eight patients with a pelvic fracture causing bladder injury, where the bony spicules were intruding the bladder musculature, preventing it from healing, thereby leading to fistula, sepsis and death.

Methods: 8 patients had a pelvic fracture along with a bladder injury. All the patients were initially operated on by a general surgeon, either immediately (4 patients) or after delayed diagnosis of a bladder rupture was made. In all cases, the bladder was primarily closed with both a suprapubic and periurethral catheter. Post-operatively, all the patients developed urine leakage and wound infection. Patients were later referred to us in a state of septicemia. After initial resuscitation and hemodynamic stabilization, all patients were subjected to re-exploration. The bladder was sutured with an omental graft and urinary diversion in the form of bilateral ureteric catheters, a suprapubic catheter, and periurethral catheter was done. All the patients developed recurrent urinary leakage after a variable period of time and landed in septicemia. Bilateral nephrostomies were done; however, these patients continued to deteriorate and succumbed.

Conclusions: Early detection and early repair is the key to success in a bladder injury. Bilateral percutaneous nephrostomy and re-exploration with bladder drainage does not help once sepsis sets in.

Key words: Bladder trauma, pelvic fracture, percutaneous nephrostomy

Introduction

Trauma is a worldwide problem and is the leading cause of mortality and morbidity among the young population [1]. Pelvic fractures constitute a small but significant proportion of traumatic skeletal injuries. However, they are associated with significant morbidity and mortality, including damage to the urethra and urinary bladder. Mortality in patients with a pelvic fracture reflects the severity of the associated organ injury and is not because of a bladder injury. We report a small series of eight patients with a pelvic fracture and bladder injury, where the bladder was probably intruded by the bony spicules preventing it from healing, thus leading to fistula, infection, sepsis and death as a result of bladder trauma.

Methods

8 patients (aged 27- 46 years) had a pelvic fracture along with bladder injury following a road traffic accident. All the patients were initially operated on by a general

surgeon, either immediately [4 patients] or after delayed diagnosis of a bladder rupture was made [4 patients]. The mean delay in diagnosis was 45 ± 2.5 hours [40-50 hours]. This delay in diagnosis was due to the fact that the patients were from far-flung areas and reported late. The diagnosis of a bladder rupture was made clinically and was supported by ultrasonography. Five of these patients had an extraperitoneal rupture and 3 had an intraperitoneal rupture. None of the patients underwent open reduction internal fixation for a fractured pelvis. None of the patients had an associated injury, which would prove fatal. Post-operatively, all the patients developed urinary leakage. Patients were later referred to us in a state of septicaemia.

After initial resuscitation and hemodynamic stabilization, all the patients were subjected to re-exploration. The mean time interval between the first and second surgery was 6.3 ± 1.5 days [4-9 days]. On re-exploration, these patients had a varying amount of perivesical and parietal wall abscesses extending up to the upper thigh and into the general peritoneal cavity. Bladder sutures were found to be gaping, with multiple bony spicules penetrating into the bladder. Drainage of abscesses, wound lavage, and extraction of bony spicules were performed. The bladder wall was oedematous and was not holding the sutures. However, the bladder was sutured with an omental flap and complete urinary diversion (i.e. bilateral ureteric catheters, a suprapubic catheter, and periurethral catheter) was done. All the patients developed recurrent urinary leakage and the bladders were refusing to heal. Despite aggressive antibiotic cover, all the patients landed in septicaemia and multi-organ dysfunction syndrome.

Another attempt to completely divert the urine by means of bilateral percutaneous nephrostomy was made, but proved futile. Thereafter the patients' poor general condition never permitted any surgical intervention. All these patients deteriorated rapidly and succumbed.

Discussion

Bladder injuries constitute one of the most common urological injuries involving the lower urinary tract [1]. The bony pelvis protects the urinary bladder very well. However, when the pelvis is fractured by blunt trauma, the bladder and urethra are injured in around 15% of cases. Although bladder injuries have been uniformly fatal in the past, with timely diagnosis, appropriate medical and surgical management now offers an excellent outcome. A bladder injury can be extra-peritoneal or intra-peritoneal, with an extra-peritoneal injury being by far the most common, accounting for 54- 85% of all bladder injuries [2]. Mortality associated with bladder injuries is 4.5-11% in various literatures [3,4]. In a recent series by Deibert et al., mortality rates were 10.8% for extraperitoneal and 6.2% for intraperitoneal injuries [5]. The reason for this mortality is bony spicules penetrating the bladder and preventing its healing as well as a second infection of the pelvic hematoma resulting in a deep pelvic abscess [6].

In our series, all the patients had a type B or C fractured pelvis along with a bladder rupture. None of the patients had any other associated injury, which would otherwise prove fatal. All these patients were operated on by general surgeons, either immediately after trauma (4 patients) or after a delay (4 patients). These patients hailed from rural far-flung areas where the services of a urologist were not available.

These patients developed urinary leakage after the 1st surgery and were later referred to us. The probable causes of leakage were improper techniques of bladder closure and failure to control the infection. When patients presented to us, all the patients had a wound infection, urinary fistula, and gross pelvic infection with peritoneal extension in four patients along with septicaemia. The deficiencies that we could identify about the primary surgery were the failure to nibble the projecting bony spicules of the fractured pelvis and an inadequate lavage. All patients were re-operated on with bladder closure, and urinary diversion. The mean time interval between the first and second surgery was 6.3 ± 1.5 days [4-9 days]. The bladder tissue was edematous and was not holding sutures. Omental flaps were used to reinforce bladder closure and diversion was done. Despite complete urinary diversion (i.e. bilateral ureteric catheters, a suprapubic catheter, and periurethral catheter) and closure, all patients again developed a urinary fistula.

We believe that the reason for the failure of two surgeries for bladder repair might be:

- Infection of pelvic hematoma, either because of surgery or due to pre-existing infected urine.
- Fractured fragments of bone were not removed, which hindered the healing of the bladder or resulted in new perforation.

Finally, an attempt to divert the urine by means of percutaneous nephrostomy was made so as to limit the infection and to hasten the recovery, but with no positive result. By this time, patients had Multiple Organ Dysfunction Syndrome and had succumbed.

Retrospectively, we presume that in the presence of septicaemia and pelvic sepsis, it would have been prudent to completely divert the urine by means of bilateral ureterostomy or nephrostomy.

Conclusions

Early detection and early repair is the key to success in a bladder injury. Bilateral Percutaneous Nephrostomy and re-exploration with bladder drainage does not help once sepsis sets in. Early complete urinary diversion can be life saving. However, more clinical experience is required to substantiate it.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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