

Pelvic and genital trauma in female motorcycle accident patients: A report of two cases and literature review

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ABSTRACT

This study aims to highlight the clinical course of genitourinary injuries associated with pelvic fractures following motorcycle accidents and to raise awareness of these injuries. This case report presents two young female patients who sustained pelvic fractures and genitourinary injuries after motorcycle accidents. The cases are compared in terms of trauma severity, associated injuries, and treatment approaches. The first patient sustained high-energy trauma resulting in severe soft tissue injuries involving the anterior vaginal wall, clitoris, and bladder neck, accompanied by active bleeding. Despite external fixation, the patient died from multi-organ failure. The second patient experienced less severe trauma, presenting with a pelvic fracture and a superficial mons pubis laceration. She was successfully managed conservatively and recovered without complications. These cases highlight the importance of thorough genital examination in female trauma patients, the necessity of a multidisciplinary approach, and the potential for timely surgical intervention to be life-saving. This report contributes to the limited literature on pelvic and genitourinary injuries in women resulting from motorcycle accidents and underscores the need for further clinical research and documentation.

Keywords: Pelvic fracture; motorcycle accident; genital trauma; female trauma patients.

INTRODUCTION

Trauma is a major cause of morbidity and mortality among young adults. According to the World Health Organization, road traffic accidents are among the leading causes of death in individuals aged 15–29 years, with motor vehicle accidents posing a particularly high risk.^[1,2] Although head injuries are the primary cause of death in these cases, pelvic injuries also contribute significantly to morbidity.

Approximately 22% of trauma-related injuries resulting from motor vehicle accidents involve the pelvis. In female patients, pelvic injuries may be associated with intra-abdominal organ damage, pelvic hemorrhage, and genital soft tissue injuries.

^[1] Vulvovaginal trauma occurs in approximately 1% of female motor vehicle accident cases, while urethral injuries are reported in about 0.2%.^[3,4] Although relatively rare, urethral trauma often indicates severe and potentially life-threatening

injury, requiring prompt diagnosis and management.

Although the initial priority in trauma care is stabilization of life-threatening conditions, timely recognition and management of genitourinary injuries are equally critical. Studies report that nearly one-third of patients with hemodynamically unstable pelvic fractures presenting to Level I trauma centers in the United States die despite aggressive resuscitation.^[5] Furthermore, motorcyclists who sustain genitourinary trauma have a significantly higher mortality rate.^[6] If left untreated, these injuries may result in long-term complications. Therefore, a thorough and systematic genital examination should be an integral component of the post-trauma evaluation in female patients.

This case report describes two female patients who sustained pelvic fractures and genitourinary injuries following motorcycle accidents. By highlighting the diagnostic and therapeutic

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challenges, this report aims to provide valuable insights for gynecologists and trauma surgeons and to contribute to the limited literature on motorcycle-related pelvic and genitourinary trauma in women.

CASE REPORT

Written informed consent was obtained from the surviving patient for publication of the case details. For the deceased patient, informed consent could not be obtained; however, all data were fully anonymized to ensure patient confidentiality. The case report complies with the principles of the Declaration of Helsinki.

Case 1

A 25-year-old woman was referred to our hospital four hours after a high-energy motorcycle collision. On admission, she was intubated, hypotensive, and required high-dose inotropic support. Her Glasgow Coma Scale (GCS) score was 3, and she was hemodynamically unstable. According to emergency medical personnel, she had been riding a motorcycle at high speed when she collided with a car at an intersection, was thrown onto the road, and lost consciousness. At the scene, she maintained spontaneous respiration and responded to painful stimuli.

Initial cranial computed tomography (CT) performed at the referring center revealed no abnormalities. Thoracic CT demonstrated fully expanded lungs without evidence of hemopneumothorax. Pelvic CT showed a horizontal fracture of the right sacrum. Due to progressive clinical deterioration and the need for multidisciplinary management, the patient was transferred to our tertiary care facility.

In the emergency department, a Focused Assessment with Sonography for Trauma (FAST) examination revealed no intra-abdominal free fluid. Physical examination revealed multiple skin lacerations and ecchymoses, a type I open fracture of the right tibial shaft, and a deep perineal laceration with active venous bleeding. As hemodynamic stabilization could not be achieved, the patient underwent emergency laparotomy and perineal exploration under general anesthesia.

The orthopedic team reduced and stabilized the pelvic fracture using an external fixator. Subsequent multidisciplinary evaluation involved general surgery, urology, and obstetrics and gynecology. Under anesthesia in the lithotomy position, genital examination revealed a normal cervix and intact fornices. A laceration of the anterior vaginal wall was identified, with partial tissue loss involving the clitoral region. The urethra and bladder neck were disrupted, and deep lacerations with active venous bleeding were observed in the paravesical and paravaginal spaces (Fig. 1). A Foley catheter was inserted, draining 200 mL of clear urine. Rectal examination was unremarkable.

While still in the operating room, the patient experienced cardiac arrest and was subsequently transferred to the inten-



Figure 1. Intraoperative image demonstrating extensive lacerations of the anterior vaginal wall and bladder neck, with active venous bleeding in the paravesical space.

sive care unit. Approximately 12 hours after the accident, she died from multiple organ failure.

Case 2

A 27-year-old woman was involved in a high-speed motorcycle collision and was ejected from the vehicle. She was brought to the emergency department two hours after the accident. On arrival, she was alert, oriented, and hemodynamically stable, with a GCS score of 15. She had no prior medical conditions or history of surgery. Her primary complaints were pelvic pain and pain in the left leg.

Unlike Case 1, this patient remained hemodynamically stable and sustained more localized injuries. FAST examination excluded intra-abdominal hemorrhage, while CT urography and cystography ruled out urethral and bladder injuries. Imaging studies, including pelvic CT and plain radiographs, revealed a nondisplaced right sacral fracture and a proximal left fibular fracture. The orthopedic team recommended conservative management with bed rest.

The gynecologic trauma team was consulted. Pelvic ultrasonography demonstrated no abnormalities of the uterus, fallopian tubes, or ovaries. On genital examination, there was no significant bruising, edema, or laceration in the perineal region. However, a 2-cm laceration was identified on the mons pubis, confined to the subcutaneous tissue and without



Figure 2. A 2-cm laceration on the mons pubis, confined to the subcutaneous tissue and without active bleeding.

active bleeding on digital examination (Fig. 2). The wound was repaired primarily.

After 48 hours of observation, the patient was discharged. At the three-month follow-up, she reported no genitourinary symptoms, and clinical evaluation confirmed complete healing.

DISCUSSION

This case report describes two female patients who sustained genital injuries in motorcycle accidents, illustrating two distinct clinical courses—one involving fatal multisystem trauma and the other a mild course with complete recovery.

Genital trauma in female motorcycle accident victims is uncommon but presents significant diagnostic and management challenges, particularly in polytrauma settings. Because most published data consist of case reports, the lack of large-scale studies limits the development of standardized treatment protocols. These injuries frequently occur in the setting of high-energy trauma, where hemodynamic stabilization is the primary priority. Although genitourinary injuries are not always immediately life-threatening, severe cases may involve major hemorrhage or nerve damage,^[7] requiring individualized management.

From a gynecological perspective, the initial evaluation should focus on identifying pelvic hemorrhage and internal genital injuries, followed by repair of external structures to reduce long-term complications. Genital injuries in motorcycle crashes frequently result from impact with structures such as the fuel tank or handlebars.^[8] Because the genital region receives a rich vascular supply from the internal pudendal artery, even superficial trauma can lead to rapid and severe bleeding.^[9]

Internal genital injuries require careful assessment due to the risk of massive bleeding and long-term reproductive sequelae. Patients with an Injury Severity Score (ISS) ≥ 25 have a higher likelihood of requiring hysterectomy (odds ratio [OR]: 3.52), whereas prompt surgical intervention for uterine or adnexal injuries is associated with lower mortality (OR: 0.27 and 0.37, respectively).^[10] These findings underscore the prognostic im-

portance of early recognition and timely surgical management in severe pelvic trauma. Although rare, combined vulvovaginal injuries often require surgical repair and occur in fewer than 0.2% of cases in large-scale analyses.^[9]

Approximately 14.6% of patients with pelvic fractures sustain bladder or urethral injuries,^[11] highlighting the importance of a multidisciplinary approach. Bladder injuries are generally managed surgically with cystostomy, whereas urethral injuries typically require reconstruction and catheterization. Pelvic trauma may also result in sexual dysfunction, which is frequently underrecognized unless specifically assessed.^[12] Therefore, routine evaluation of sexual and reproductive function should be incorporated into post-trauma follow-up.

Early intervention, hemodynamic stabilization, and appropriate surgical management are critical to improving survival and outcomes in patients with pelvic fractures. Techniques such as pelvic tamponade, external fixation, angiography, and embolization are effective in controlling bleeding and preventing secondary complications.^[13,14] Stabilization of the pelvic ring is essential to prevent recurrent bleeding and organ displacement.

The prognosis of genital trauma resulting from motorcycle accidents depends on injury severity, timing of intervention, and associated complications. Early stabilization and timely surgical management improve both survival and long-term functional outcomes. Patient education and structured follow-up focusing on sexual and reproductive health are also essential components of comprehensive post-trauma care.

CONCLUSION

Although genital trauma associated with pelvic fractures in women following motorcycle accidents is rare, it can lead to serious complications and requires prompt, coordinated care. Further multicenter studies are needed to establish evidence-based protocols and to improve both acute management and long-term outcomes.

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OLGU SUNUMU - ÖZ

Motosiklet kazası sonrası kadın hastalarda görülen pelvik ve genital travma: İki olgu sunumu ve literatür incelemesi

Bu çalışmanın amacı, motosiklet kazası sonrası gelişen pelvik kırıklara eşlik eden genitoüriner yaralanmaların klinik seyrini değerlendirmek ve bu travmalar konusunda farkındalık oluşturmaktır. Ayrıca, acil sağlık hizmetlerinde bu tür yaralanmaların tanı ve tedavi sürecine dair dikkat çekilmesi amaçlanmıştır. Bu olgu sunumunda, motosiklet kazası sonrasında pelvik kırık ve genitoüriner yaralanma gelişen iki genç kadın hastanın klinik süreci detaylı şekilde aktarılmıştır. Olgular, travmanın şiddeti, eşlik eden yaralanmalar, uygulanan görüntüleme yöntemleri, cerrahi girişimler ve tedavi yaklaşımları açısından karşılaştırılmıştır. İlk olguda, yüksek enerjili travmaya bağlı olarak anterior vajinal duvar, klitoris ve mesane boynunda ciddi yumuşak doku hasarı ve aktif kanama ile seyreden kompleks bir pelvik kırık mevcuttu. Hastaya acil dış fiksasyon uygulanmış, ancak gelişen çoklu organ yetmezliği nedeniyle hasta kaybedilmiştir. İkinci olguda ise daha yüzeysel karakterde, konservatif yöntemlerle takip edilen mons pubis bölgesinde yüzeysel laserasyon ve pelvik kırık izlenmiş, hasta komplikasyonsuz şekilde tamamen iyileşmiştir. Kadın travma hastalarında ayrıntılı genital muayenenin atlanmaması, multidisipliner yaklaşımın benimsenmesi ve cerrahi müdahalenin zamanında yapılması hayat kurtarıcı olabilir. Bu olgu sunumu, motosiklet kazalarına bağlı olarak kadınlarda gelişen pelvik ve genitoüriner yaralanmalara dair literatürdeki sınırlı bilgi birikimine önemli katkı sağlamaktadır ve benzer olguların yönetimine yönelik farkındalığı artırmayı hedeflemektedir.

Anahtar sözcükler: Genital travma; kadın travma hastaları; motosiklet kazası; pelvik kırık.

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