**Case Report**

**Urine in the thigh, an extraordinary complication of pelvic fracture: Vesicocutaneous fistula**

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**ABSTRACT**

We present a case of a 67-year-old woman who was initially treated conservatively for pelvic fracture. After 4 weeks, she was admitted to our clinic with swelling and pain in the distal part of her right thigh. Ultrasonography and magnetic resonance imaging showed accumulation of fluid between the subcutaneous adipose tissue and fascia. Urine was detected by a puncture. Bladder injury was detected in the left anterolateral wall using computed tomography. A fistula tract was observed from the right side of the bladder neck in cystogram, which confirmed the diagnosis of vesicocutaneous fistula. Bladder drainage was achieved using a urethral catheter, and the fistula was closed without any complication. The control cystogram showed healing of the bladder. All the patients with pelvic fractures should be evaluated by urine analysis and examined for associated urethral or bladder injury using retrograde urethrography and cystography.

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**Introduction**

Pelvic fractures occur after high-energy injuries such as traffic accidents and fall from heights, and related injuries may occur owing to the severity of the trauma. Therefore, evaluation and management of the pelvic fractures may require a multidisciplinary approach. Urethral or bladder injuries can be seen in 6%-15% of the cases of pelvic injuries (1). Anatomically, 40%-60% of the bladder injuries are extraperitoneal, 15%-30% are intraperitoneal, and 10%-25% are mixed injuries (2).

Patients presenting with pelvic trauma should be carefully evaluated for concomitant urological injury. We report the case of a patient diagnosed with vesicocutaneous fistula (VCF), with anteromedial swelling and pain in the middle-lower one-third of the right thigh after a neglected bladder injury.

**Case Presentation**

A 67-year-old female patient was admitted to the emergency department of an external center after a traffic accident. Her radiographic examinations revealed right minimally displaced ramus superior and ramus inferior fractures and non-displaced left ramus superior and inferior fractures (Figure 1). Neurological and vascular examinations of the patient were normal. General surgery and neurosurgery consultations revealed no pathology. As stability is defined as the ability to withstand the physiological forces and the patient’s computed tomography (CT) results revealed a minimally displaced anterior arch fracture without accompanying displacement in the sacroiliac joint and pubic symphysis, this case was classified as a stable fracture according to the Tile classification (3) (Figure 2). Conservative treatment was selected for the pelvic fracture in the external center, and the patient was discharged with bed rest, nonsteroidal anti-inflammatory drugs, and low-molecular-weight heparin treatment after 24-hour follow-up. She was called for follow-up at 10-day intervals to the external center where she was first admitted. However, she visited our hospital instead of the external center because of the newly emerging pain in her right thigh at the end of the first month.

The first physical examination in our hospital revealed redness, swelling, and tenderness in the distal one-third of her right thigh. A preliminary diagnosis of an abscess or a hematoma was considered.

Complete blood count, erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP) tests were performed. Hemoglobin was 10.8 g/dL, white blood cell count was 7.1×10⁹/µL, platelet count was 223×10⁹/µL, ESR was 54 mm/h, and CRP was 14.1 mg/mL. There was no vascular pathology in the arterial and venous Doppler ultrasonography. Superficial ultrasonography showed an accumulation of fluid extending from the medial proximal part of the thigh to the distal part of the thigh, having a maximum thickness of about 7.5 cm and occasional separations.

The fluid was accumulated between the subcutaneous adipose tissue and the fascia and did not extend into the muscular tissue. Magnetic resonance imaging was performed to clarify the liquid collection, and it revealed a multiloculated fluid starting from the right femoral region and extending along the femoral trace medial to the popliteal fossa, with a transverse diam-
eter reaching 90 mm in the deep area and a longitudinal length covering the entire thigh (Figure 3). With the preliminary diagnosis of chronic hematoma or abscess formation, puncture was performed in the thigh region under sterile conditions. However, the punctured material was not an abscess or hematoma (Figure 4). Drainage was performed by making a 2-cm incision (Figure 4).

Urology consultations were requested when the drained fluid was detected as urine. The abdominal CT performed at the external center, where the patient had been evaluated after the traffic accident, was re-evaluated, and bladder injury was detected in the left anterolateral wall (Figure 5). The patient underwent catheterization, and cystography was performed (Figure 6). No leakage was observed up to 70

**HIGHLIGHTS**

- We report the case of a patient diagnosed with vesicocutaneous fistula (VCF) after pelvic fracture.
- VCF is a tract that develops between the bladder and skin tissue.
- Urethral or bladder injuries can be seen in 6%-15% of the cases of pelvic injuries.
- All the patients with pelvic fractures should be evaluated by urine analysis and examined for associated urethral or bladder injury.
mL. However, after 70 mL, a fistula tract was observed from the right side of the bladder neck. While filling the bladder, it was observed that the fistula tract progressed along the right thigh and was fistu-
-located (Figure 7). The patient was found to have an extraperitoneal bladder injury. Tolterodine L-tartrate at 4 mg/day was started when the urine leakage was detected during coughing. Urine culture was performed after 30 leukocytes and 20 erythrocytes were detected in the complete urine analysis. Urine culture resulted in 100,000 colony forming units of *Pseudomonas aeruginosa*.

*Klebsiella pneumoniae* was isolated from the wound site. Treatment with 1 g of meropenem 3 times a day was started for 10 days. At follow-up, the signs of urinary tract infection improved, no pathogenic bacteria were detected in the urine culture, the redness of the wound disappeared, and the wound temperature decreased. Urological follow-up was continued after the discharge from the mouth of the fistula stopped. The closure of the VCF was confirmed by the absence of fistula and the absence of urine leakage with pressure on the control cystogram performed 20 days later (Figure 8).

**Discussion**

VCF is a tract that develops between the bladder and skin tissue, which should not normally occur. As a result, the urine moves through the tract and drains from the mouth of the fistula. Superficial or deep soft tissue or bone infections may develop as a result of VCF. This reduces the vitality and the quality of life by affecting the basic functions. VCF causes disability because of the local or systemic side effects.

VCF may develop after trauma; after regional surgery that may cause bladder injuries, such as cesarean surgery or hernia surgery, after failed bladder exstrophy repair (4), after local radiotherapy for malignancies (5), and as a result of giant bladder stones. VCF may also occur as a complication several years after total hip arthroplasty or pelvic ectopic kidney pyonephrosis (6).

Literature reports a case of VCF after intravesical mitomycin treatment for bladder cancer (7). VCF cases after pelvic fracture are very rare in the English reports (8). Patients with pelvic fractures associated with urethral injury usually present with gross hematuria; however, a small proportion of these patients do not have gross hematuria, and urine analysis can detect 30-50 or more red blood cells (RBCs)/high-power field. All the patients with this condition should be evaluated by cystography, and urethral injury should be ruled out (9).

Urethral injury should be evaluated using retrograde urethrogram (RUG), and the presence of bladder injury should be evaluated using cystography in the absence of pathology in RUG. In the case of urethral or bladder injury, a urology consultation should be requested. Intraperitoneal bladder ruptures can be repaired with exploratory laparotomy and suture, followed by a Foley or suprapubic catheter. Extraperitoneal bladder ruptures can be treated with a Foley catheter and antibiotic prophylaxis (10).

In our case, extraperitoneal bladder injury was detected, which could be treated conservatively without surgical treatment. The patient was evaluated by cystography in urological controls, and the bladder wall was confirmed by absence of fistula and absence of urine leakage with pressure on the control cystogram performed 20 days later (Figure 8).
Fistulectomy may be necessary after the VCF develops. Vacuum-assisted closure can be applied to close the VCF. The VCF can also be treated using the omental flap interposition method (12). Large VCF may require rectus femoris musculocutaneous flap surgery, and a bipedicled latissimus dorsi and serratus anterior free flap (13).

Although VCF is rare, it can cause potentially fatal sepsis, especially in elderly patients with comorbidities (14). VCF may cause abscess formation and pubic osteomyelitis, if not treated (15).

Because of the absence of lesions accompanying the extraperitoneal bladder injury, we performed bladder drainage using a urethral catheter to treat the bladder injury. Antibiotherapy and local wound care prevented the discharge, the fistula was closed, and the soft tissue infection was prevented by conservative treatment. The patient’s control cystogram showed healing of the bladder injury.

All the patients with pelvic fractures should be evaluated by urine analysis for the presence of RBCs. Cases of visible hematuria accompanying the pelvic fracture or nonvisible hematuria combined with disruption of the pelvic circle having more than 1 cm of displacement or more than 1 cm of diastasis of the pubic symphysis should be examined for associated urethral or bladder injury by RUG and cystography (1, 16).

Conclusion

We report this case to alert our colleagues about VCF after pelvic fractures. Patients with pelvic fractures who are exposed to high-energy trauma should be followed up for additional organ injury. High suspicion of additional associated organ injuries will reduce the morbidity and mortality in these patients.

Informed consent: Written informed consent was obtained from patient who participated in this study.

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