Case Report

Drain catheter-induced urinary bladder fistula: A rare complication following exploratory laparotomy for duodenal ulcer

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ABSTRACT

Pelvic drains are commonly used in abdominal surgeries to prevent fluid accumulation, identify post-operative complications, and allow early detection of anastomotic leakage. We report a rare case of a 35-year-old male who developed a urinary bladder fistula a few days after exploratory laparotomy for a perforated duodenal ulcer. The patient initially presented with generalized abdominal pain, fever, and peritonitis. Imaging confirmed pneumoperitoneum, and an emergency laparotomy revealed a perforated duodenal ulcer. A right subhepatic drain and a pelvic drain were placed. On post-operative day 5, the pelvic drain output increased and resembled urine. Further imaging revealed that the drain tip had entered the bladder, causing a fistula. Conservative management with urethral catheterization and drain repositioning was successful. This case highlights the importance of vigilance during drain placement, awareness of risk factors such as prolonged drain retention, and early recognition of atypical drain output. It also underscores the role of conservative management in selected cases.

Key words: Fistula, Pelvic drains, Perforated duodenal ulcer, Peritonitis, Post-operative complications, Surgical drainage, Urinary bladder injury

Pelvic drains are frequently used in abdominal surgeries to prevent intra-abdominal fluid collections, monitor for post-operative complications, and facilitate early detection of anastomotic leaks or bleeding [1]. Despite these benefits, their use is not without risk. Complications such as infection, hemorrhage, and visceral injury have been reported [1]. Urinary bladder fistulas, in particular, are usually associated with pelvic malignancy, radiation therapy, trauma, or previous pelvic surgery [2]. Drain-induced urinary bladder fistula, however, is an exceptionally rare entity, with only isolated reports in the literature. The rationale for reporting this case lies in its uniqueness and clinical relevance. Surgeons should remain vigilant for this complication, especially in patients with prolonged drain retention, atypical drain output, or clinical suspicion of urinary tract involvement. This case report aims to highlight the possible mechanisms, risk factors, and management strategies of this unusual complication.

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CASE PRESENTATION

A 35-year-old medically free male presented with severe abdominal pain of 1-day duration. The pain began in the epigastrium, moderate in intensity, intermittent, and later became generalized, severe, and associated with fever and anorexia. No prior history of peptic ulcer disease or abdominal surgery was reported.

The patient appeared ill and in pain. Vitals included heart rate of 110 bpm, blood pressure of 100/60 mmHg, respiratory rate of 24, and temperature of 39.8°C. The abdomen was rigid with generalized tenderness, guarding, and absent bowel sounds.

Laboratory findings included white blood cells 11.3 × 10^9/L, hemoglobin 9.2 g/dL, and platelets 193 × 10^9/L. The renal and electrolyte profiles were normal. An erect chest X-ray showed free air under the diaphragm, as shown in Fig. 1. Abdominal X-ray showed multiple air-fluid levels.

Exploratory laparotomy revealed about 100 mL of serous peritoneal fluid aspirated intraoperatively and a 2 × 2 mm perforation in the first part of the duodenum (Fig. 2a). It was repaired with a Modified Graham Patch.

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A 20Fr pelvic tube drain was placed in the Douglas pouch, and a right subhepatic drain in Morrison's pouch. The subhepatic drain was removed on post-operative day 2; the pelvic drain remained due to >50 mL serosanguinous output. By post-operative day 3, the pelvic drain fluid became suspicious (Fig. 2b). A urinary catheter was retained for monitoring. On day 5, the patient insisted on catheter removal. Following this, drain output increased, resembling urine (Fig. 2c). Cystography confirmed that the drain tip had entered the bladder, forming a fistula, as shown in Fig. 3.

Management included reinsertion of a Foley catheter for 7 days and repositioning of the drain. Drain output gradually ceased, and 2 weeks later, imaging confirmed closure. The patient later developed cystitis and epididymo-orchitis, treated with antibiotics. Follow-up for 2 months was uneventful.

DISCUSSION

Drain-induced urinary bladder fistula is an exceedingly rare post-operative complication. In most surgical settings, drains are considered safe when used judiciously; however, the risk of injury increases with prolonged retention, inappropriate positioning, or the use of large-bore tubes [3,4]. In our patient, erosion of the bladder wall by the pelvic drain tip most likely resulted in fistula formation. This mechanism has been previously suggested in other drain-related visceral injuries, including enteric and biliary fistulas [5-7].

The differential diagnosis in cases of suspicious drain output includes ureteral injury, intraoperative bladder perforation, and enterovesical fistula [3,8,9]. Intraoperative bladder injury is often detected immediately, but delayed presentation, as in our case, is usually due to progressive erosion rather than direct surgical trauma. Recognition is essential, since failure to differentiate these conditions may lead to unnecessary re-exploration. Cystography, as applied here, is regarded as the gold standard for confirming bladder communication [4,5].

Management strategies depend on the size of the defect, timing of diagnosis, and associated comorbidities. Conservative management with urethral catheterization and drainage is often sufficient for small injuries, allowing spontaneous closure of the fistula within 1–2 weeks [10]. In contrast, larger or complex fistulas may necessitate surgical repair, especially if the injury is associated with ongoing infection, necrosis, or patient instability [9,10]. In our case, conservative management proved successful, supporting previous reports that advocate catheter drainage as a first-line approach in selected patients [8].

The literature describes several iatrogenic bladder injuries, most commonly related to gynecological and urological procedures [3,6,9]. Catheter-related bladder perforations have also been reported, particularly in patients with long-term indwelling catheters [8]. However, cases specifically attributed to pelvic drains eroding into the bladder remain extremely rare.

Preventive strategies are therefore crucial. Surgeons should ensure proper placement of pelvic drains under direct vision, avoid unnecessary use of large-bore drains, and remove drains as early as clinically feasible [1,7]. Prolonged retention, as seen in our patient, significantly increases the risk of erosion. Furthermore, vigilant monitoring of drain output characteristics, particularly when fluid resembles urine, should prompt immediate investigation.

This case contributes to the limited body of evidence on drain-induced bladder injuries. It reinforces the importance of clinical suspicion, timely imaging, and individualized management. From a preventive perspective, careful drain placement under direct vision, judicious selection of drain size, and timely removal remain the most effective strategies to avoid such injuries. By reporting this case, we aim to raise awareness of this rare complication and emphasize the need for vigilance among surgeons when managing patients with pelvic drains.

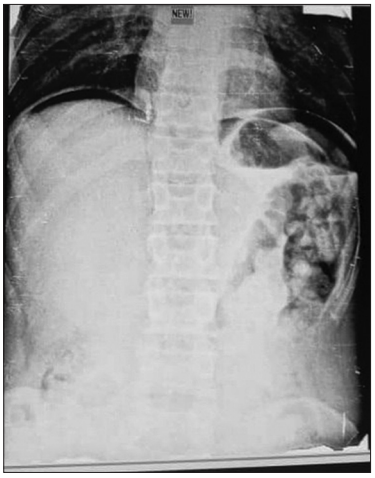

Figure 1: Erect chest X-ray showed air under diaphragm

Figure 2: (a) Perforated duodenal ulcer; (b) Drain before urinary catheter removal; (c) Drain after removal of urinary catheter

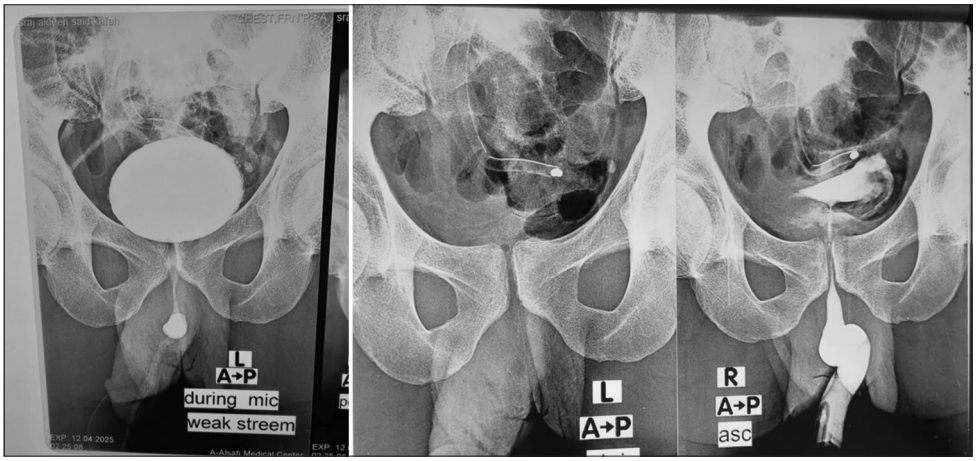

Figure 3: Ascending cystogram showed drain tip entered the bladder

CONCLUSION

This case illustrates a rare but important complication of pelvic drain usage: urinary bladder fistula formation. Although uncommon, this condition should be suspected when post-operative drain output resembles urine, particularly in patients with prolonged drain retention. Early recognition and appropriate imaging, such as cystography, are essential for accurate diagnosis. Conservative management with urethral catheterization can be successful in small and uncomplicated fistulas, while larger or persistent defects may require surgical intervention.

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