Urology Case Reports 51 (2023) 102589

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Inflammation and infection

Gangrene of the abdomen secondary to spontaneous extraperitoneal bladder rupture: A case report

Guillaume Tcheutchoua Soh [a,*], Modou Ndiaye [b], Omar Gaye [b], Ousmane Thiam [c], Ibrahima Cisse [b], Papa Ameth Fall [b]

[a] Department of Surgery, Gaston Berger University, Saint-Louis, Senegal
[b] Department of Urology, Cheikh Anta Diop University, Dakar, Senegal
[c] Department of General Surgery, Cheikh Anta Diop University, Dakar, Senegal

ARTICLE INFO

Keywords:
Gangrene
Bladder rupture
Abdominal wall
Spontaneous perforation

ABSTRACT

Spontaneous bladder rupture is a rare condition, and its diagnosis has evolved over time. The clinical presentation is variable and nonspecific, with prognosis depending on the patient's condition and early recognition. We report a case of spontaneous bladder rupture complicated by abdominal wall gangrene managed in our center. The purpose of this report is to update the knowledge available on this disease.

1. Introduction

Bladder rupture is the disruption of the bladder wall's continuity. It is usually caused by trauma in 96.6 % of cases and occurs spontaneously in 3.4 % of cases.[1] Spontaneous ruptures occur in 1 in 126,000 people and have been associated with several factors such as acute alcohol consumption, radiotherapy, lower urinary tract obstruction, infection, diverticular disease, and neurogenic bladder.[2,3] Ruptures may be intraperitoneal or extraperitoneal, with intraperitoneal ruptures accounting for approximately 89 % of cases.[4] Extraperitoneal ruptures are rare and more challenging to diagnose. The mortality rate for spontaneous rupture can be as high as 25 %.[5] Keeler conducted the first comprehensive review of published cases, highlighting changes in epidemiology, diagnosis, treatment, and prognosis over time.[6] The objective of this work is to report a case of abdominal wall gangrene following spontaneous extraperitoneal bladder rupture to update the knowledge available on this topic.

2. Case presentation

We present the case of a 76-year-old female who initially consulted for dysuria and a burning sensation during urination. Cytobacteriological examination was negative, and cystoscopy revealed no abnormalities. However, one week later, she returned with complaints of abdominal pain, constipation, and urine retention. Upon examination, we observed a distended bladder and normal rectal findings. After Foley catheter insertion, we noted purulent urine discharge. Ultrasound revealed bladder diverticula, infiltration, and a subcutaneous abdominal wall collection. Fig. 1. Two days after, the Foley catheter was removed by the patient in his house. she returned with fever, abdominal pain, and anuria. After Foley catheter insertion, we noted purulent urine discharge. Physical examination revealed anemia, a soft abdomen, and two discolored areas on the abdomen, one periumbilical measuring 5 cm with fluctuation and one on the right flank. Laboratory tests showed severe anemia (hemoglobin 5.4 g/L), a total white blood cell count of 42,000 with neutrophil predominance, an elevated C-reactive protein level of 198 mg/L, and normal kidney function. A CT scan revealed an extraperitoneal bladder rupture communicating with two parietal collections and gas infiltration in the abdominal wall. Fig. 2. The diagnosis of extraperitoneal bladder rupture was confirmed, and the patient underwent conservative treatment with bladder drainage, blood transfusion, and antibiotic. Ten hours later, surgery was performed after the development of skin necrosis and crepitus. Fig. 3. During exploration, a 5 cm rupture was found on the anterior bladder wall, along with skin necrosis in the periumbilical region and right flank. Fig. 4. The bladder was repaired, and necrotic tissue was removed. The patient received empirical antibiotics (ceftriaxone, gentamycin, and metronidazole), and pus cultures isolated Escherichia coli, which was sensitive to cefoxitin, ertapenem, and tobramycin. The post-operative course was complicated by hydroelectrolytic disturbances and multi-organ failure. The patient

* Corresponding author.
E-mail address: guillaume.tcheutchoua83@gmail.com (G. Tcheutchoua Soh).

https://doi.org/10.1016/j.eucr.2023.102589
Received 8 September 2023; Received in revised form 1 October 2023; Accepted 13 October 2023
Available online 14 October 2023

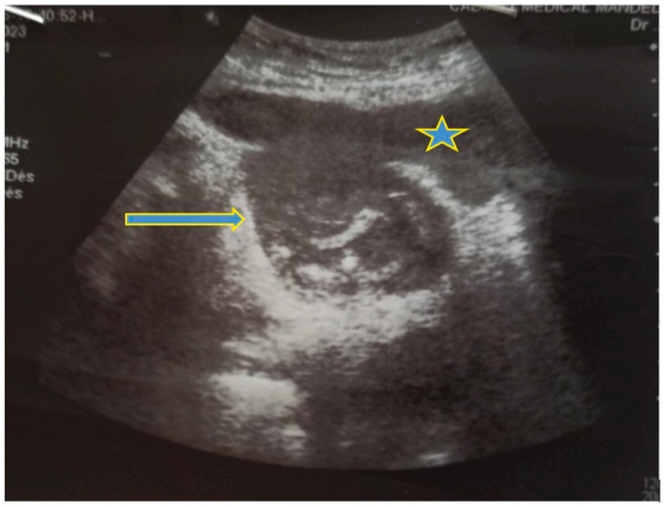

Fig. 1. Rupture of bladder Wall (Arrow), collection of fluid in abdominal wall (star).

experienced a stroke on the second day and died on the third day.

3. Discussion

Spontaneous bladder rupture is rare and occurs in the absence of trauma and external stimulation. The first detailed description was made by Harrison in 1886.[7] The initial series of case reports in the literature was presented by Keeler in 1990.[6] He reported 9 cases published worldwide before his own case. Since then, the number of reported cases of spontaneous bladder rupture has increased.[6] Reddy, in his review, identified 351 reported cases.[4] This increase can be attributed to the widespread use of new diagnostic methods such as CT scans, urethrocystography, and ultrasound. In our case, the diagnosis was confirmed by a CT scan.

Key factors associated with spontaneous bladder rupture, as identified by Keeler, include infection and lower urinary tract obstruction.[6] However, current research suggests that radiotherapy and acute alcohol consumption are more prevalent causes.[4,8] Reddy's review noted a high incidence of pelvic cancer and radiotherapy in patients with spontaneous bladder rupture.[4] In our case, there was no history of alcohol consumption or radiotherapy, and cystoscopy revealed no abnormalities. Ultrasound and CT scans did not reveal the aetiology, showing only evidence of bladder rupture and abdominal wall infiltration, which was initially interpreted as diverticula.

Intraperitoneal rupture is more frequent, presented with peritonitis, ascites and renal failure due to reabsorption of urea and creatinine.[9] Extraperitoneal bladder rupture is characterized by a lack of specific symptoms and nonspecific findings.[10,11] In our case, the patient presented with abdominal pain, anuria, pyuria, fever, and constipation. These symptoms can lead to misdiagnosis, as seen in 64.2 % of cases in Reddy's review.[4] Abdominal wall gangrene is an indicator of delayed diagnosis and is exceptionally rare in cases of bladder rupture. Only three cases of gangrene following spontaneous bladder rupture have been reported, including abdominal wall gangrene following bladder cancer rupture, penile gangrene following spontaneous bladder rupture during circumcision in a new-born infant, and scrotal gangrene following bladder rupture contained within an inguinal hernia in an infant.[11–13] In our case, gangrene may have resulted from the rupture of infected urine, possibly leading to synergistic gangrene. The prognosis was poor due to delayed diagnosis, the patient's age, the presence of severe sepsis, and multifocal lesions, all of which are poor prognostic factors in necrotizing fasciitis.[14]

4. Conclusion

Spontaneous bladder rupture can occur even in a seemingly healthy bladder. It can be complicated by abdominal gangrene when diagnosed late. When encountering a patient with nonspecific lower urinary tract

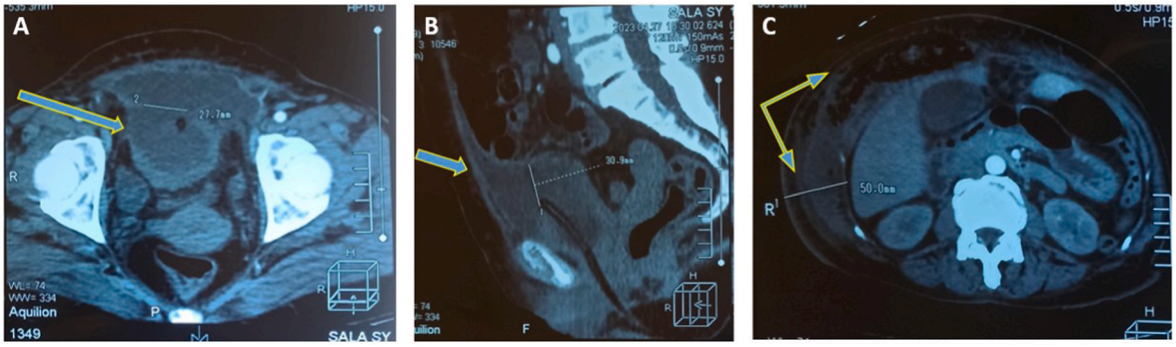

Fig. 2. CT of the abdomen showing bladder rupture (A), extraperitoneal fluid collection (B), and a mixed fluid and gas collection in the abdominal wall (C).

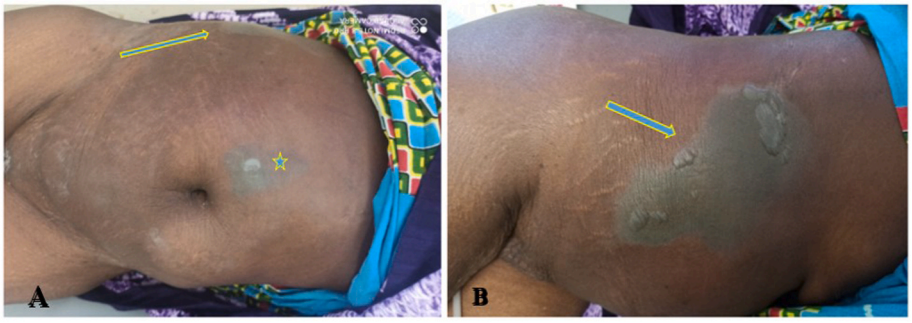

Fig. 3. Evolution of lesions after 10 hours of conservative treatment.

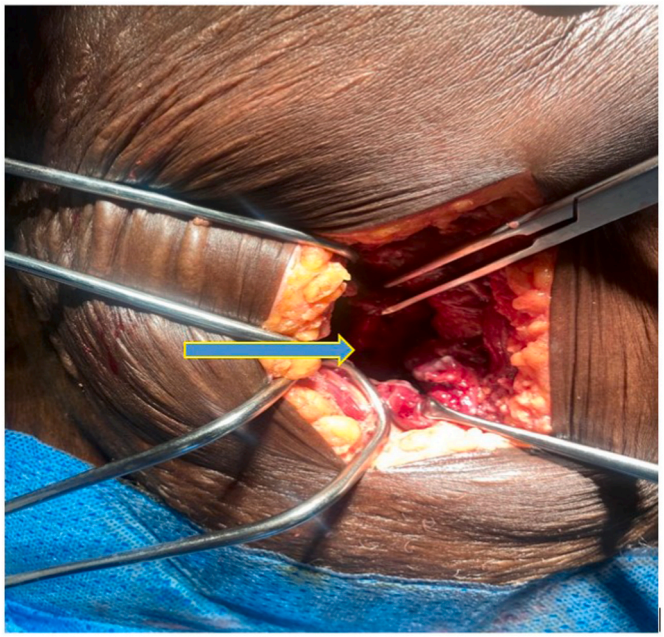

Fig. 4. Rupture of anterior part of bladder.

symptoms and an inability to pass urine, the possibility of bladder rupture should be considered by the surgeon.

Ethical approval

The Hospital Ethical Committee gave the agreement to report this case.

Funding

The authors declare they have received no funding for the preparation of this document.

Author contribution

These authors participated in the making and correction of this document. All authors agreed with the publication of the document.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Registration of research studies

Not commissioned, externally peer-reviewed.

Guarantor

Not commissioned, externally peer-reviewed.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Declaration of Competing Interest

The authors report no declarations of interest.

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