



## Oddities

## Case Report: A Neocystostomy Perforation Presenting as a Gallstone

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## ABSTRACT

An 83-year-old man, with a surgical history of radical cystectomy with simultaneous construction of a neobladder 13 years ago, presented clinically and radiologically as acute cholecystitis. Upon emergent exploratory laparotomy for his acute deterioration, a perforated neobladder was identified with its spilled stones in the gallbladder fossa, mimicking acute cholecystitis. This is the first case report of this presentation. Neobladder perforations should be considered in any patient who has undergone orthotopic bladder substitution, no matter how long it has been since the original reconstruction.

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## Introduction

“Neobladder” is a term used synonymously with orthotopic urinary diversion. Orthotopic diversion is a term that describes a piece of bowel that is surgically constructed into a spherical pouch and anastomosed to the native urethra. The interposed bowel segments become “transitionalized” and over time, “thinned out” which may predispose to rupture, especially in the debilitated patient. Spontaneous rupture of a neobladder is a fairly uncommon complication. But, rupture in the face of stones within the neobladder is rare at best. This is the first documented presentation of a ruptured neobladder presenting as acute cholecystitis.

## Case presentation

An 83-year-old male with a history of bladder cancer 13 years ago for which he underwent a radical cystectomy presented to the emergency department with a one-day history of persistent, upper quadrant abdominal pain. He endorsed nausea, vomiting and a low-grade fever. Other past medical history include hypertension and hypothyroidism. He had no known drug allergies and was taking aspirin, meloxicam, nifedipine, levothyroxine and multivitamins. His family history and social history were non contributory. On physical examination, there was some tenderness to palpation in

the right upper quadrant, without guarding or rigidity. A healed midline abdominal scar was noted. General examination was otherwise unremarkable.

Biochemical and hematological investigations showed elevated creatinine 2.3 mg/dl, mild leukocytosis of 8.8 k/mm<sup>3</sup> and normal liver function tests. Given the patient's presenting complaint of abdominal pain and fever, an infectious or inflammatory process was investigated. A Computerized Tomography (CT) scan of the abdomen and pelvis demonstrated gallbladder distention (Fig. 1).

The abnormal gallbladder impression on CT scan prompted an ultrasound (US) of the abdomen which revealed a calculus within the gallbladder measuring 1.9 cm (Fig. 2.). There was pericholecystic fluid and a positive sonographic Murphy's sign, without gallbladder thickening. The common bile duct was normal and measured 3.7 mm in diameter. The liver was unremarkable. Given the sonographic findings coupled with the patient's abdominal pain, our assessment was early acute cholecystitis vs biliary colic. We planned for a cholecystectomy.

On the second day of hospitalization, the patient deteriorated. His urine output was low despite multiple boluses. His abdominal pain worsened and he developed a leukocytosis of 15 k/mm<sup>3</sup>. His physical exam demonstrated signs of diffuse peritonitis. A heightened level of concern for a missed gastrointestinal perforation prompted an emergent exploratory laparotomy. A perforation at the site of the neocystostomy with accompanying free urine and fluid in the abdomen was identified. Two stones were found in the right upper quadrant around Morrison's pouch/gallbladder fossa (Fig. 3), but palpation of the gallbladder did not reveal any palpable

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**Figure 1.** Calcified density seen within gallbladder.

stones within. The neobladder was subsequently repaired primarily.

Following the operation, the patient was admitted to the surgical intensive care unit (SICU). His clinical course was slow but over time he regained strength. His renal function and urinary output continued to improve steadily and by postoperative day 10 his creatinine level dropped back down to baseline (1.4 mg/dl). He suffered with an ileus post operatively but eventually his bowel function returned and he was tolerating a diet. He was thereafter discharged to a rehabilitation facility.

## Discussion

The case described in this article highlights the rare complication of spontaneous calculus neobladder rupture,<sup>1</sup> but also the first recorded case of an expelled bladder stone being washed up into the right upper quadrant and mimicking a gallstone. There are well known risk factors for rupture in patients with neobladders who present with acute abdominal signs and symptoms. The most common initiating events that lead to a rupture are (1) over distension of the neobladder usually secondary to obstruction (2) adhesions that place strain on the neobladder and (3) trauma.<sup>2</sup>

Currently, there are no classic set of features, which strongly suggest the diagnosis of a ruptured neobladder. However, there is a string of uniformity, which can be seen as one reviews the handful

of cases reported. Each patient presented with a primary complaint of severe abdominal pain with recent oliguria or anuria and acute renal insufficiency.<sup>3</sup> Interestingly on physical exam these patients demonstrate diffuse tenderness and only half of the patients had signs of peritonitis, this may reflect the mild inflammatory response to urine compared to feculent matter in gastrointestinal perforations. On imaging, neobladder ruptures usually reveal unexplained free fluid as opposed to pneumoperitoneum. Therefore the majority of reported cases were identified on exploratory laparotomy as patients failed to progress. Although clarity is much more crystal in retrospect, this case does shed light on the hallmarks of neobladder perforation with ease. However, more practically, surgical exploration is usually relegated to patients where there are concerns of gastrointestinal perforation<sup>4,5</sup> and neobladder rupture was not anticipated.

Neobladder perforations can occur at any stage or time post operatively, with recorded cases that have occurred 5 years out from the date of surgical construction. Consequently, this diagnosis can easily be missed. Again, there has been no documented case of a urinary stone being expelled from a neobladder and mimicking a gallstone. However, there was a reported case of a urinary stone expelled from a neobladder that ended up resting in the pelvis and was misconstrued as a possible malignancy.<sup>4</sup> There is not much reported regarding the properties of these neobladder stones, they appear to be calcium oxalate and calcium phosphate that had heterogeneously nucleated around a “mucus nidus.”

## Conclusion

Neobladder perforation is a rare complication that can occur at any stage or time post operatively. Hallmarks of this complication



**Figure 2.** US showing a gallstone.



**Figure 3.** The two stones extracted from Morrison's pouch.

include sudden oliguria/anuria/renal insufficiency, unexplained ascites on imaging and late peritonitis. Although it is associated with traumatic events, spontaneous rupture due to obstruction from stones is a considerable etiology of this complication. Expelled stones from these perforations can mimic other conditions and lead to the wrong diagnosis.

#### **Conflict of interest**

The authors declare they have no conflicts of interest.

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