

A Major Clinical Event Following Transperineal Prostate Biopsy: An Unexpected Duodenal Perforation

Rafael Boscolo-Berto,¹ Claudio Lamon,¹ Roberto Vezzo²

¹Department of Oncological and Surgical Sciences, Urology Clinic, University of Padua, Italy; ²Institute of Radiology, University of Padua, Italy

Submitted January 11, 2010 - Accepted for Publication February 5, 2010

ABSTRACT

A 73-year-old Caucasian male underwent an ultrasound-guided transperineal prostate biopsy in an outpatient setting. Prostate cancer was suspected because of persistently rising prostate-specific antigen levels. The procedure was concluded early because the patient complained of extreme discomfort after the transrectal probe was inserted. After less than an hour, the patient described an acute abdominal pain that began suddenly after completion of the biopsy. Results of a computed tomography scan led to an emergency exploratory laparotomy. This procedure revealed a small duodenal perforation that was caused by a peptic ulcer and immediately repaired. The major clinical event of duodenal perforation following the execution of a transperineal prostate biopsy posed an immediate diagnostic challenge. The closely related timing of these 2 distinct and unlinked events represents the most unusual aspect of the case. It is a reminder that a concurrent disease always has to be considered and excluded despite the temporal closeness of reckoned occurrences.

INTRODUCTION

Transperineal ultrasound-guided biopsy is a diagnostic procedure for detecting prostate cancer that is typically performed in an outpatient setting. Ultrasound-guided prostate needle biopsy has become one of the most common procedures in the daily practice of urologists [1]. Complications are occasionally encountered. Most complications are considered minor, meaning that they do not need any treatment and are self-resolving. A small number of cases have major complications that sometimes require hospitalization and, in rare exception, can lead to death [2-5]. The present authors report an anecdotal and probably underestimated association of a major clinical event (in this case, duodenal perforation) following the execution of a transperineal prostate biopsy [6].

CASE REPORT

A 73-year-old Caucasian male presented as an outpatient in the authors' department to undergo an ultrasound-guided

transperineal prostate biopsy. Prostate cancer was suspected because of persistently rising levels of prostate-specific antigen (5.8 ng/mL; 15% free:total ratio).

Evaluations

The patient had unremarkable previous medical and surgical histories. He was a retired trucker who smoked 15 cigarettes per day. He did not regularly consume any medications with the exception of tamsulosin, which was prescribed because of moderate low urinary tract symptoms involving predominantly the voiding phase. He never underwent an appendectomy or inguinal repair of a hernia. He had no known colonic disease such as diverticulosis, inflammatory bowel disease, or active or past colitis. He had not received any recent instrumental, endoscopic, or radiological investigation of the colonic segments. His family history yielded no additional helpful information.

On digital rectal exploration, painful internal and external

KEYWORDS: Transperineal prostate biopsy; Peptic duodenal perforation; Complication

CORRESPONDENCE: Dr. Rafael Boscolo-Berto, Department of Oncological and Surgical Sciences, Urology Clinic, University of Padua, Via Giustiniani 2, 35100 Padua, Italy (boscolorafael@tiscali.it).

CITATION: *UroToday Int J.* 2010 Apr;3(2). doi:10.3834/uij.1944-5784.2010.04.08

hemorrhoids were noted. The prostate was classified as a regular gland of about 60 cc, with no further clinical remarks. Preparation for the transperineal prostate biopsy consisted of an enema the same morning of the procedure and prophylactic prulifloxacin 600mg that was orally self-administered the previous evening.

Transperineal Biopsy Procedure

The patient was placed in a lithotomy position. An anesthetic block of the periprostatic plexus was performed by administering 2 mL of 1% mepivacaine at the prostate apex. The biopsy procedure was conducted through a single median transperineal access 1.5 cm above the anal sphincter. A 17-gauge coaxial needle was inserted up to the prostate apex through the anesthetized perineal path under ultrasound guidance (Siemens Sonoline G50 Diagnostic Ultrasound System with a 7.75-MHz biplanar transrectal linear probe, Siemens Medical Solutions, Forchheim, Germany). After the removal of the blunt tip stylet, the guiding cannula of the coaxial needle was used as the transperineal path for repeated atraumatic passage of the biopsy needle (Tru-Cut 18 G; cutting length of 23 mm) [7]. The patient underwent a 14-core TRUS-guided transperineal prostate biopsy (12 cores from the peripheral zone; 2 cores from the transitional zones).

The procedure was interrupted early because the patient complained of extreme discomfort after the transrectal probe was inserted. The ultrasound probe was easily removed and inspected. It was stained with blood that originated from the internal and external hemorrhoids previously noted. No persistent rectal bleeding was observed. The biopsy retrieved a sufficient number of cores for the pathological evaluation, so the procedure was considered complete and the patient was discharged.

Postbiopsy Complication

After less than an hour, the patient was admitted to the authors' clinic directly from the emergency department. He complained of an acute abdominal pain that began suddenly after the completion of the transperineal prostate biopsy. The patient described the pain as an unexpected stab to the lower abdomen. The symptom then diminished in intensity but maintained its localization.

On physical examination, the abdomen was rigid and painful to superficial and deep bimanual palpation. The patient's breathing was superficial because deep inhalation exacerbated the pain. He had no fever and vital signs were stable. Blood tests showed a slight increase of PCR and white cell count, without any remarks. Because the abdominal symptoms and clinical prostration persisted, an abdominal computed tomography (CT) scan with contrast medium (CT - SOMATOM

Definition, Siemens Medical Solutions, Forchheim, Germany) was scheduled.

The frontal scout view of the abdominal CT scan showed an intestinal distension with prevalent features of ileum, without free air under the diaphragm or clear signs of air-fluid levels (Figure 1a). This finding was confirmed on transverse slices of the lower abdomen and pelvis (Figure 1b), and free fluid was detected around the ileum (Figure 1c). No signs of free air were noted, nor was there direct indication of an intestinal perforation aside from a spread thickening of the perivisceral fat (Figure 1b). The content of the small pelvis was regular. There were no noted changes to the sigma or rectum, and the prostate did not show any abnormal finding (Figure 1d).

The patient underwent an emergency exploratory laparotomy because the physicians suspected that he had a gastrointestinal disease that was not defined by the preoperative radiological imaging. A small intestinal perforation was found between the second and third part of the duodenum, with bile salts

Figure 1a. Abdominal CT Frontal Scout Showing an Intestinal Distension With Prevalent Features of Ileum, Without Free Air Under the Diaphragm or Clear Signs of Air-fluid Levels (arrows).

doi: 10.3834/uj.1944-5784.2010.04.08f1a



Figure 1b. Abdominal CT Transverse Slice Showing Intestinal Distension With Prevalent Features of Ileum (thin arrows), and a Spread Thickening of the Perivisceral Fat (thick arrows). doi: 10.3834/uij.1944-5784.2010.04.08f1b

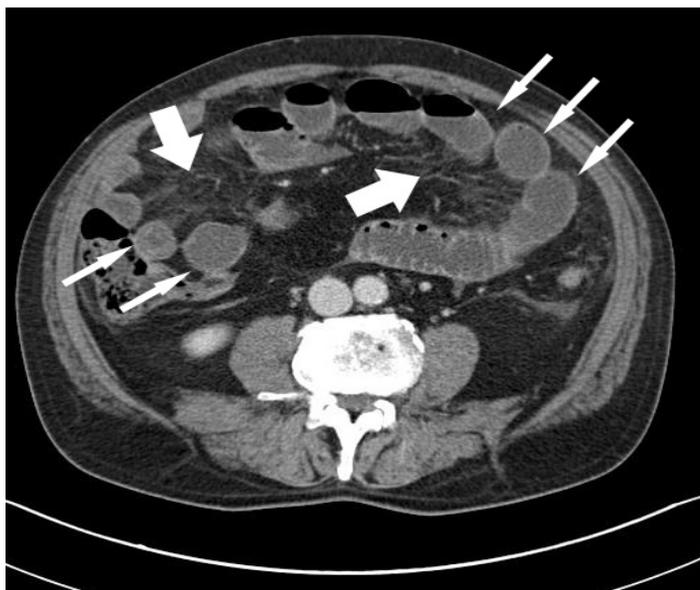


Figure 1c. Abdominal CT Transverse Slice Showing Some Free Fluid Around the Ileum (arrow). doi: 10.3834/uij.1944-5784.2010.04.08f1c



and succus entericus throughout the peritoneal cavity. The perforated duodenal defect was directly repaired. The postoperative course was uneventful, and the patient was discharged a few days later.

Biopsy Results

The histopathological analysis of the cores retrieved by prostatic biopsy revealed the presence of a prostatic cancer with a Gleason sum score of 5 (TNM 2002: cT1c cN0). Two months later, the patient chose to have a retropubic radical prostatectomy. There were no further complications.

DISCUSSION

Technical principles of ultrasound-guided prostatic biopsy are well established through both transperineal and transrectal routes. It is considered a safe and simple procedure that can be easily performed in an outpatient setting with the support of local anesthesia.

Complications are occasionally encountered. Minor complications include hematospermia (36.3%), hematuria (14.5%), rectal bleeding for less than 2 days (2.3%), epididymitis (0.2%), low urinary tract symptoms such as difficulty voiding (1.9%), or urgency (0.65%). Major complications, reported in a small number of cases, include fever over 38°C/100.4°F (0.8%), acute prostatitis (3.8%), sepsis (0.3%), rectal bleeding requiring surgical intervention or persisting for more than 2 days (0.6%),

urinary retention (0.2%), vasovagal syncope (0.05%), and rarely death [2-5].

Some clinical urological conditions may have an ambiguous onset and lead to incorrect initial diagnoses. This is especially true when the conditions mimic nosological entities or present overlapping signs with other pathological conditions. At times, these incorrect diagnoses may be life threatening [8].

Initial Hypothesis: Rectal Perforation From the Transperineal Probe

In the present case, the clinical presentation led to a variety of initial hypotheses. The patient did not report any gastroenteric diseases, consumption of daily nonsteroidal or anti-inflammatory drugs, or previous diagnosis of conditions predisposing him to a duodenal peptic ulcer perforation. Therefore, the first explanation considered was some kind of link to the immediately preceding prostate biopsy. Specifically, the initial focus was on the use of an ultrasound transrectal probe in a patient with internal and external hemorrhoids. This hypothesis was reinforced by the extreme discomfort felt by the patient during the procedure.

There were no reports in the literature on a rectal perforation produced by an ultrasound transrectal probe, corroborating the anatomical deduction that a lubricated ultrasound

Figure 1d. Abdominal CT Transverse Slice Showing the Regular Content of Small Pelvis in the Absence of Any Abnormal Finding. doi: 10.3834/uij.1944-5784.2010.04.08f1d



probe inserted by the anus up to the prostate gland cannot overtake in projection the anterior peritoneal reflexion on the anterior face of rectum. Therefore, the free fluid detected by transverse slices of the abdominal CT did not provide a reasonable explanation for the initial hypothesis of a causal connection. Nevertheless, the possibility that a more generic *foreign body* could provoke a wide range of damage to the terminal intestinal tract (including a colorectal perforation) is contemplated in several published articles.

A recent review by Kurer et al [9] included 81 papers comprising 3 case series and 78 case reports about patients reporting a foreign colorectal body. This review summarizes 196 clinical presentations of this particular condition. The authors reported the diagnosis of a colorectal perforation in 13 out of 196 patients (6.6%), with an associated peritonitis or sepsis described in 7 of the 13. In 11 cases, repair of the perforation was accompanied by the formation of a colostomy; 3 patients developed serious complications subsequent to peritonitis during the recovery period, leading to 1 death [9]. There are other anecdotal reports of perforations due to medical acts, such as barium enema examination [10]. In these patients the potential mechanisms of injury included trauma, overinflation of the balloon, insertion of instruments, and associated preexisting disease of the rectal mucosa.

Correct Diagnosis: Duodenal Peptic Ulcer Perforation

In the present case, the abdominal symptoms and clinical

prostration persisted and the performed radiological investigation did not provide a reasonable pathogenesis of rectal perforation. Therefore, an emergency exploratory laparotomy was mandatory. The duodenal peptic ulcer perforation was then recognized and immediately repaired without any further sequelae.

It should be noted that despite the introduction of histamine H₂-receptor antagonists, proton-pump inhibitors, and the discovery of *Helicobacter pylori*, both the incidence of emergency surgery for perforated peptic ulcer and the mortality rate for patients undergoing surgery for peptic ulcer perforation have increased during the last decade [11]. Hence, a checklist for differential diagnoses involving acute abdominal pain has to include this possibility, even in previously asymptomatic patients without prior diagnosis of gastroenteric disease. The physician needs to be aware that perforated peptic ulcer has an increasing prevalence in the otherwise healthy population [12].

CONCLUSION

The closely related timing of a transperineal ultrasound-guided biopsy and duodenal peptic ulcer perforation, 2 distinct and unlinked events, represents the most unusual aspect of the present case. It is a reminder that a concurrent disease always has to be considered and excluded in absence of clear explanation about the pathogenesis of a complex and unexpected clinical picture, despite the temporal closeness of reckoned occurrences.

REFERENCES

- [1] Fitzsimons NJ, Sun L, Moul JW. Medical technologies for the diagnosis of prostate cancer. *Expert Rev Med Devices*. 2007;4(2):227-239.
- [2] Suzuki M, Kawakami S, Asano T, et al. Safety of transperineal 14-core systematic prostate biopsy in diabetic men. *Int J Urol*. 2009;16(12):930-935.
- [3] Berger AP, Gozzi C, Steiner H, et al. Complication rate of transrectal ultrasound guided prostate biopsy: a comparison among 3 protocols with 6, 10 and 15 cores. *J Urol*. 2004;171(4):1478-1481.
- [4] Djavan B, Waldert M, Zlotta A, et al. Safety and morbidity of first and repeat transrectal ultrasound guided prostate needle biopsies: results of a prospective European prostate cancer detection study. *J Urol*. 2001;166(3):856-860.
- [5] Chiang IN, Chang SJ, Pu YS, Huang KH, YU HJ, Huang CY. Major complications and associated risk factors of transrectal ultrasound guided prostate needle biopsy: a retrospective study of 1875 cases in taiwan. *J Formos Med Assoc*. 2007;106(11):929-934.

- [6] Boscolo-Berto R. Clinical testing and evidence-based medicine: when the absence of evidence doesn't mean evidence of absence [in Italian]. *G Ital Nefrol.* 2009;26(4):417.
- [7] Novella G, Ficarra V, Galfano A, et al. Pain assessment after original transperineal prostate biopsy using a coaxial needle. *Urology.* 2003;62(4):689-692.
- [8] Chitale S, Debbarma M, Wilson P, Burgess N, Peat D. Urological pathology causing free air under the diaphragm? *Ann R Coll Surg Engl.* 2008;90(8):W3-5.
- [9] Kurer MA, Davey C, Khan S, Chintapatla S. Colorectal Foreign Bodies: A systematic review. *Colorectal Dis.* 2009 Nov 5 [Epub ahead of print].
- [10] Tadros S, Watters JM. Retroperitoneal perforation of the rectum during barium enema examination. *Can J Surg.* 1988;31(1):49-50.
- [11] Moller MH, Adamsen S, Wojdemann M, Moller AM. Perforated peptic ulcer: how to improve outcome? *Scand J Gastroenterol.* 2009;44(1):15-22.
- [12] Ramakrishnan K, Salinas RC. Peptic ulcer disease. *Am Fam Physician.* 2007;76(7):1005-1012.