

# *Subcutaneous emphysema following cystoscopic clot evacuation*

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*Gross hematuria is a common urologic problem which often requires surgical intervention. While generally a safe procedure, clot evacuation can have serious complications. Here we describe the case of an 85-year-old male who developed extensive subcutaneous*

*emphysema following a small extraperitoneal bladder perforation during a clot evacuation. While our patient did well with expectant management, subcutaneous emphysema can lead to serious complications and any endourologic procedure should be stopped once crepitus is noted.*

**Key Words:** subcutaneous emphysema, hematuria, surgical complications

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## Introduction

Gross hematuria is a common urologic complaint, accounting for a large number of office and emergency department visits. Hematuria causing intractable urinary retention or hemodynamic instability is a urologic emergency which requires urgent surgical management. Clot evacuation under anesthesia with the use of a large-bore cystoscope sheath allows both relief of obstruction and the ability to use thermal coagulation instruments to effect hemostasis.

While generally felt to be a safe procedure, clot evacuation can result in serious complications including perforation of the bladder. Here we describe the rare but striking complication of diffuse subcutaneous emphysema following clot evacuation.

## Case report

The patient was an 85-year-old man who presented to the emergency department with gross hematuria. He had a history of benign prostatic enlargement status post transurethral resection of his prostate 8 years ago and atrial fibrillation managed with dabigatran

for secondary stroke prophylaxis. The patient had received an outpatient computed tomography urogram which revealed prostatic calcifications but no other potential causes of bleeding. In the emergency department a 24 Fr 3 way catheter was placed with return of thick, bloody output with clots. The patient was hypotensive and the bladder was unable to be hand irrigated due to large clot burden prompting emergent transfer to the operating room.

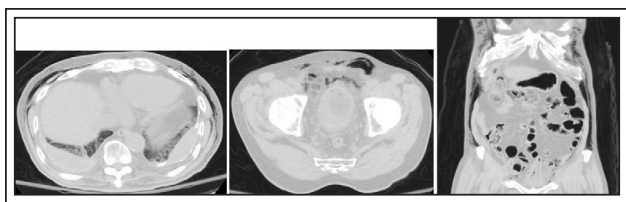
Intraoperatively a resectoscope with a 26 Fr sheath was placed and evacuation of approximately 200 cc of well formed clot was performed with a Toomey syringe. Cystoscopy revealed active bleeding from friable vessels at the bladder neck which were cauterized. At the end of the procedure there was noted to be a small tear in the right posterior bladder wall with visible perivesical fat. This was felt to be resultant from aggressive irrigation, either intraoperatively or in the emergency department. A 24 Fr 3 way catheter was replaced at the end of the case and his urine remained clear.

The patient did well postoperatively, however on postoperative day one he was noted to have crepitus extending throughout his chest, abdomen and scrotum. A computed tomography scan was obtained, Figure 1, which showed subcutaneous emphysema of the chest, anterior abdominal wall, bilateral inguinal canals and scrotum. Additionally, a computed tomography cystogram, Figure 2, showed a right sided extraperitoneal bladder perforation.

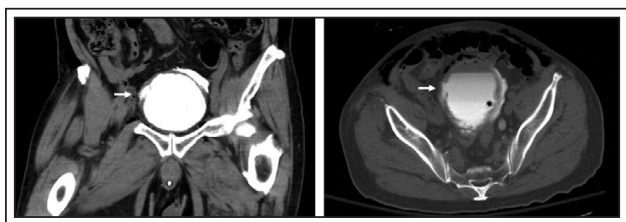
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**Figure 1.** Contrast enhanced computed tomography showing subcutaneous emphysema extending from chest wall through inguinal canal.



**Figure 2.** Computed tomography cystogram showing small extraperitoneal bladder perforation on right lateral wall with extravasation of contrast, marked with arrow on coronal and axial images.

On postoperative day two the patient was discharged home with a foley catheter in place. His crepitus resolved without any symptoms or intervention. He had a repeat cystogram in 14 days which showed no extravasation of contrast. His foley catheter was removed at that time with no subsequent complications.

## Discussion

Crepitus, also known as subcutaneous emphysema, is a worrisome sign to any urologist as it often heralds a necrotizing soft tissue infection. Iatrogenic causes of subcutaneous emphysema are increasingly being identified, however, as it is a common finding following laparoscopic urologic procedures.

Subcutaneous emphysema following introduction of air into the retroperitoneum is a recognized phenomenon. It has been reported either following perforation of a hollow viscus, such as during a colonoscopy, sigmoid polypectomy or ruptured duodenal ulcer, or after introduction of air into the retroperitoneal space as during a diagnostic peritoneoscopy.<sup>1,2</sup>

Outside of the gastrointestinal tract, there are a few reports in the literature regarding subcutaneous emphysema following urologic retroperitoneal procedures. Subcutaneous emphysema is uncommon following endourologic procedures, and to our knowledge this is the third case report of such an occurrence. Two

reports of massive pneumomediastinum during transurethral resection of the prostate (TURP) describe different etiologies; one through microperforations of the prostatic capsule and the other through an unrecognized bladder injury. Both of these patients' subcutaneous emphysema was managed expectantly, however, one had a large accumulation of irrigant intraperitoneally with signs of abdominal compartment syndrome which required decompression during the TURP.<sup>3,4</sup>

Air can travel from the retroperitoneum to distant parts of the body through anatomic connections. The retroperitoneum is connected to the mediastinum through the diaphragmatic hiatus, to the scrotum through the spermatic cord, and to the thigh through the femoral vessels. Conversely, air can dissect through tissue planes and travel longitudinally along contiguous fascia. In our patient, we assume air traveled through the bladder perforation into the space of Retzius and dissected through the tissue to Scarpa's fascia, along which it moved both cranially and caudally.

Differences in insufflation techniques may account for the rarity of this event following an endourologic procedure compared with gastrointestinal procedures. Colonoscopy uses air to distend the viscus which is then able to easily pass through microperforations and quickly dissect through tissue. In endourologic procedures the use of saline or water as irrigation drastically decreases the amount of air inside the organ, thus reducing the likelihood of a significant amount of air escaping through a perforation.

While this was a benign finding in our patient, it can rarely cause serious complications such as abdominal compartment syndrome<sup>4</sup> or tension pneumothorax.<sup>5</sup> Due to these possibilities, if recognized intraoperatively the procedure should be stopped and the patient observed in the hospital for development of further sequelae. □

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