

Subcutaneous and Scrotal Emphysema Following Suprapubic Cystostomy in a Patient With Colovesical Fistula

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Subcutaneous and scrotal emphysema are rare complications of suprapubic cystostomy. We present here a rare case of an 81-year-old man with colovesical fistula who had severe subcutaneous and scrotal emphysema after percutaneous suprapubic cystostomy was performed. We inserted a new Foley catheter via the urethra, removed the suprapubic cystostomy and incised his scrotal emphysema for open drainage. The patient's subcutaneous emphysema slowly healed. [*J Chin Med Assoc* 2010;73(5):265–267]

Key Words: scrotal emphysema, subcutaneous emphysema, suprapubic cystostomy

Introduction

Percutaneous suprapubic cystostomy (PSC) is a common procedure practiced to relieve urinary retention in case of urethral obstruction. However, complications such as bowel perforation, catheter-related infection, and subcutaneous and scrotal emphysema can occur. Moreover, there is a lack of awareness in daily practice.

Case Report

An 81-year-old man was brought to the Emergency Department of Changhua Christian Hospital, Changhua because of lassitude and pyrexia. Tracing his past medical history, he had received low anterior resection with loop colostomy and concurrent chemoradiotherapy recently due to rectal adenocarcinoma (T3N1MX). On arrival, left costophrenic angle percussion pain and a distended urinary bladder were noted during physical examination. The patient was febrile at 38.6°C. His blood pressure was 108/64 mmHg, his heart rate was

102 beats/min, and his respiratory rate was 20 breaths/min. Initial laboratory values showed that the white blood cell count was 26,700/ μ L with 83% segmented neutrophils and 14% band neutrophils. Blood urea nitrogen levels were 144.4 mg/dL, serum creatinine levels were 7.7 mg/dL and serum sodium was 128 mmol/L. Urinalysis showed a red blood cell count >100 per high-powered field, white blood cell count >100 per high-powered field and numerous bacteria. The tentative diagnosis was urosepsis with acute renal failure and obstructive uropathy.

Therefore, the patient was admitted for empirical antibiotic treatment with cefazolin and adequate intravenous fluid rehydration. A Foley catheter was inserted immediately via his urethra for smooth drainage of urine, but his daily urine output amount decreased gradually, with 4,470 mL on the 1st hospital day, 1,910 mL on the 2nd hospital day and 860 mL on the 3rd hospital day. A distended urinary bladder developed, and a renal echogram showed urinary retention with bilateral moderate to severe hydronephrosis. Follow-up laboratory studies of leukocytes (white blood cell count



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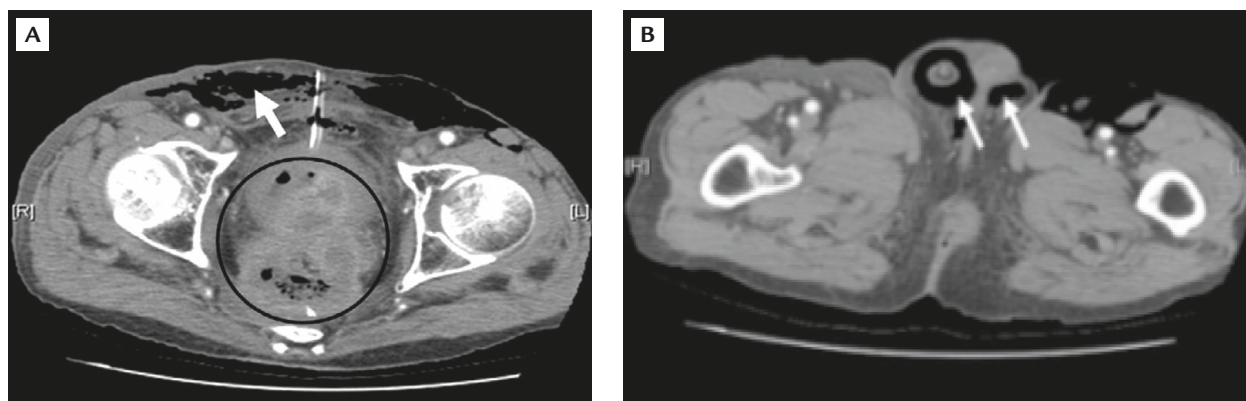


Figure 1. (A) Computed tomography of the retroperitoneum shows a soft tissue tumor with a lobulated margin and heterogeneous enhancement (black circle), subcutaneous emphysema (white arrow) and air within the colovesical fistula. (B) Computed tomography of the retroperitoneum shows air in the scrotum (white arrows).

was 12,400/ μ L with 83% segmented neutrophils and 3% band neutrophils), serum creatinine (3.9 mg/dL) and blood urea nitrogen (90.1 mg/dL) all showed improvement. Both sets of the patient's blood cultures yielded *Escherichia coli*, which was sensitive to ceftazidime treatment. Urine culture yielded *E. coli*, which was sensitive to ceftazidime, and *Proteus mirabilis*, which was resistant to ceftazidime. However, we failed to insert a Foley catheter via the urethra again due to urethral stricture. Therefore, PSC was arranged on the 4th hospital day.

After the PSC was performed, urine was drained out smoothly from 1,390 mL to 2,720 mL daily, yet a high fever (39°C) recurred on the 6th hospital day. On physical examination, the skin showed erythematous and painful swelling, and tenderness and crepitus over the bilateral lumbar, inguinal and hypogastric regions of the abdomen according to the 9-region scheme. Painful swelling of the scrotum with emphysematous skin change and air-like content were also observed. Anatomically, the extension of the subcutaneous emphysema expanded from the intertubercular line at the abdominal wall to the pelvis at the pelvic brim. A subsequent echogram showed a blurry vision field with a low-resolution image. A chest X-ray displayed no pneumothorax, but indicated compensated expansion of the right lung with mediastinum shifting to the left, and bilateral flank subcutaneous emphysema. A plain radiograph of the kidneys, ureters and bladder revealed excessive bowel gas retention and suprapubic cystostomy *in situ*. Computed tomography revealed a large tumor mass on the right pelvic floor that invaded into the prostate and bladder forming a colovesical fistula of which local recurrence of rectal carcinoma or lung metastasis on the right lower lobe may have been the cause, air in the scrotum, and subcutaneous

emphysema on the pelvic wall. Subcutaneous, scrotal emphysema and colovesical fistula were observed (Figure 1). Optic urethrotomy was performed for both cystostomy and colovesical fistula repairs. A new Foley catheter was inserted via the patient's urethra. We incised his scrotal emphysema for open drainage. We gave parenteral antibiotics of ceftazidime 1 g/8 hours for the *E. coli* bacteremia. The patient's subcutaneous and scrotal emphysema slowly healed with surgical intervention and antibiotic use.

Discussion

The presence of gas outside the respiratory tract and hollow organs is always worrisome. Some gases may be associated with infection of gas-forming bacteria, and others may indicate traumatic injury or perforation of hollow organs. Both situations are of concern for the physician.

Complications related to PSC are unusual but are still sometimes found. Retroperitoneal hemorrhage,¹ tube dislodgement,² bladder calculi formation³ and bowel injury including perforation, volvulus and obstruction¹ have been reported. Among them, a non-distended, small bladder capacity is believed to be the main risk factor.⁴ Reports on severe subcutaneous emphysema complicated after PSC are limited.⁵ Bacterial infection with anaerobes or Gram-negative rods can produce gas within soft tissue that transgress the tissue barrier and result in crepitation. Fungal infection with *Aspergillus fumigatus* and *Candida albicans* has been documented to cause emphysematous cystitis, although it is uncommon to be the pathogen for emphysematous change.⁶ Nonetheless, subcutaneous emphysema is not always caused by infection. Air may

also infiltrate subcutaneous tissue from a loosely sutured wound at the puncture site of PSC. Our patient presented with severe subcutaneous emphysema at the bilateral flank area extending down to the scrotum after PSC. Since no bladder perforation was initially discovered and spinal anesthesia excluded the possibility of intubation trauma, diffuse subcutaneous emphysema was diagnosed and the invasive procedure, emphysematous cystitis (gas-forming infection) or colovesical fistula were the possible causes. However, no further evidence was found to clarify whether or not the perforation had resulted from suprapubic cystostomy, and therefore, we speculate that aggressive air formation may have been induced by the colovesical fistula, which was not related to the insertion of the suprapubic catheter using a punch trocar technique. Colovesical fistula ensures a chronic bacterial infection status in the bladder in which emphysematous organisms would almost be inevitable. Besides the presence of gas-forming organisms, previous radiotherapy that the patient received for rectal cancer was suspected to have also played a role. Radiation-induced proctosigmoiditis perforation has been reported to cause severe subcutaneous emphysema in the abdominal wall.⁷ Limited reports have also shown non-traumatic subcutaneous emphysema in cancer patients mainly due to gastrointestinal fistula between hollow organs and subcutaneous tissue.^{8,9}

In our case, the PSC was removed and urethrotomy was performed for cystostomy and fistula repair. A Foley catheter was reinserted via the urethra. Moreover, incision and drainage were carried out for scrotal abscess, and antibiotics were prescribed according to the latest urine culture. Despite persistent pyuria, subcutaneous emphysema gradually improved in 2 weeks and the patient was discharged successfully for clinical follow-up.

To minimize complications in PSC, an adequately distended bladder with patients in the Trendelenburg position is necessary. Extraperitoneal puncture under ultrasound guidance is preferred.¹⁰ Morbidity associated with PSC, although uncommon, is still possible. Colovesical fistula should be considered for patients receiving lower abdomen radiation therapy to prevent PSC-associated complications. Whenever colovesical fistula is suspected, a prompt radiography survey of the kidneys, ureters and bladder or computed tomography should be arranged to ensure early diagnosis.

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