CASE REPORT

Air in the urine: a mystified patient and a concerned surgeon

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SUMMARY

Appendicovesical fistula is a rare type of enterovesical and a very rare complication of acute appendicitis. Herein, we report a case of a 22-year-old man who presented with cloudy urine and pneumaturia with a prior history of acute appendicitis. Imaging techniques including ultrasonography, CT and cystoscopy were performed to diagnose the abnormality. Diagnosis of this fistula is challenging and relies on detailed history and radiological imaging.

BACKGROUND

Vesicoenteric fistula is known complication of inflammatory bowel disease (diverticulitis, Crohn's disease, ulcerative colitis) and malignancy of colon. The fistula between vermiform appendix and bladder is rare. It most commonly occurs following an earlier attack of acute appendicitis managed conservatively.^{1–3} It is commonly seen in younger age group (10–40 years) and male gender.⁴ Patients usually seek delayed attention or neglect early symptoms which lead to abscess formation and over time formation of appendicovesical fistula (AVF). A small fistula will present with intermittent symptoms like pneumaturia and or recurrent Urinary Tract Infections (UTI) or cloudy urine.⁵ For this reason delay in diagnosis is usually the norm. We are presenting a rare case of large appendicular fecalith complicating AVF.

CASE PRESENTATION

A 22-year-old man presented with occasional cloudy urine and passage of air bubbles in urine for last 12 months. He had a history of acute right iliac fossa pain 14 months ago which was managed

conservatively. Physical examination was within normal limits. Urine examination revealed elevated white cell count and urine culture was positive for *Escherichia coli*. His Total Leucocyte Count (TLC) was 14 200/mm³.

INVESTIGATIONS

Ultrasound abdomen showed right perivesical hypoechoic polypoidal lesion (size-4×2 cm) abutting or invading the base and right lateral wall of the urinary bladder (figure 1). There was thickening of the urinary bladder wall. Contrast-enhanced CT scan showed contrast filling appendix tracking inferiorly towards the right side of pelvis measuring 4 cm with heterogeneous air filled collection at the right perivesical region. Surrounding fat stranding was also present (figure 1). The patient was then referred to urology department by the concerned surgeon. A decision was taken to perform cystoscopy which showed the presence of bullous oedema and debris in the bladder with bilateral ureterovesical junction showing clear efflux of urine. A small opening was seen in the right lateral wall of the bladder through which a 0.038 guide wire and 6 Fr ureteric catheter could be passed for some distance as shown (figure 1). A diagnosis of AVF was made.

DIFFERENTIAL DIAGNOSIS

AVF, rectovesical fistula, prostatorectal fistula, fistula due to inflammatory bowel disease.

TREATMENT

After proper consent and counselling, a surgical exploration was planned. A midline exploratory infraumbilical incision was made. There was no adhesion of bowel or omentum in the pelvis.

An appendix was pelvic in location and tip was adhered to the base of the urinary bladder. On palpation, a stony hard fecalith was palpable in the tip of the appendix which was removed. An appendix was dissected and appendectomy is done. A small fistulous opening was also seen in the bladder which was repaired. Omental interposition was done and secured with suture fixation (figure 2). A pelvic drain was placed and per-urethral catheter left in situ. Postoperative period was uneventful.

Per-urethral catheter was removed on postoperative day 7 and drain was removed on day 8.

OUTCOME AND FOLLOW-UP

At 3-month follow-up, the patient is doing well and completely asymptomatic.

Figure 1 (A–C) Ultrasound abdomen showed right perivesical hypoechoic polypoidal lesion (size-4×2 cm) abutting or invading base and right lateral wall of the urinary bladder (A). CT scan showed heterogeneous air filled collection at right perivesical region with surrounding fat stranding (marked by arrows) (B). Cystoscopy image showing bullous oedema in bladder (C).

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Figure 2 (A–E) Intraoperative photograph showing appendix (marked by black arrow) (A). Dissection of appendix (B). Impacted fecalith (C). Omental interposition (D). Specimen showing removed appendix and fecalith (E).

DISCUSSION

Enterovesical fistula may be caused due to benign inflammatory or malignant conditions of the alimentary tract. AVF is a rare kind of enterovesical fistula resulting as a complication of the benign or malignant appendicular condition.

The pathogenesis starts at the episode of acute appendicitis and consequent abscess formation. This happens more commonly if conservative antibiotic therapy was started rather than surgical removal of the appendix. The abscess leads to further inflammation of nearby bladder wall ultimately leading to fistula formation.

The symptoms of AVF usually manifest later following an acute attack of appendicitis. Early presentation includes pneumaturia, recurrent UTI, fecaluria, cloudy urine and occasionally haematuria. Gastrointestinal symptoms range from mild cramps to severe abdominal pain and diarrhoea. Hypokalaemic hyperchloraemic metabolic acidosis can be one of AVF presentations.⁶

Diagnosing AVF fistula is quite challenging. Often patients do not give a proper history of acute appendicitis or the picture is not clear. Initial evaluation with ultrasound may show features of bladder wall thickening. CT scan has good sensitivity to detect inflamed appendix and fistula details. CT has newly been advocated for documentation of AVF.⁷ The various findings include the presence of gas in the bladder in particular patients without recent transurethral instrumentation, focal bladder-wall thickening, thickening of the adjacent bowel wall and an extraluminal mass that often contained air.⁸

Cystoscopy is very informative before taking a patient for operation. Cystoscopy is able to diagnose AVF in 40% of the cases.⁹ CT cystography has been introduced as the most accurate diagnostic test.⁸ In our case, CT scan revealed features suggestive of AVF and cystoscopy helped in making the diagnosis.

Management of this condition includes exploratory laparotomy with appendectomy and closure of fistula site interposition flap. Now, with advent of minimal invasive options, laparoscopic management has also evolved.¹⁰

Learning points

- ▶ Clinician should keep in mind a strong suspicion of appendicovesical fistula (AVF) in a young patient presenting with pneumaturia, cloudy urine with a history suggestive of acute appendicitis in past.
- ▶ Contrast-enhanced CT scan should be considered as a diagnostic modality of choice for AVF.
- ▶ Appendectomy and repair of bladder fistula with interposition flap should be a primary goal in management.

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