A rare case of an appendiceal mass masquerading as a pelvic tumour and causing bilateral hydronephrosis

Abdul Rashid SN*,1,2, Ab Hamid S2, Mohamad Saini S2, Muridan R1

1 Department of Radiology, University of Malaya Medical Centre, Kuala Lumpur, Malaysia
2 Department of Radiology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia

Received 28 April 2011; received in revised form 24 November 2011; accepted 8 January 2012

ABSTRACT

Diagnosing acute appendicitis in children can be difficult due to atypical presenting symptoms. While there are reported cases of acute appendicitis or appendiceal masses causing unilateral hydronephrosis, bilateral hydronephrosis as a complication of appendiceal mass is very rare. We report a case of a child who presented with cardinal symptomatology associated with the urogenital tract. Ultrasound (US) investigation showed a pelvic mass causing bilateral hydronephrosis. An initial diagnosis of a pelvic teratoma was made based on the US and computed tomography (CT) scan findings. The final diagnosis of an appendiceal mass causing bilateral hydronephrosis was established intraoperatively. © 2012 Biomedical Imaging and Intervention Journal. All rights reserved.

Keywords: Appendiceal mass, bilateral hydronephrosis, pelvic teratoma, children.

INTRODUCTION

The appendix is a 2–20 cm part of the large bowel, arising from the caecum, 1.7–2.5 cm distal to the ileocaecal valve. The most common anatomical position of the appendix is retrocaecal (60–65%); followed by pelvic, where the tip lies in the lesser pelvic cavity (30%); subcaecal (0.5%); and ileocaecal (1.5%). In 5% of cases, the appendix is partially or totally located in the retroperitoneal space.

Appendicitis and appendicular abscesses are frequently found in paediatric populations. Urinary tract obstruction is an uncommon but well-recognized consequence of appendicitis. Obstruction usually occurs on the right side, and the occurrence of bilateral hydronephrosis secondary to acute appendicitis is very rare.

We report a case of a patient who presented with bilateral hydronephrosis, which was initially attributed to a pelvic teratoma. However, operative findings revealed an appendiceal mass.

CASE REPORT

An eight-year-old Chinese girl presented to a private hospital with a nine-day history of suprapubic pain, frequency, dysuria and mild dehydration associated with low-grade fever. Her vital signs were stable and there was no palpable mass.

Abdominal ultrasound showed a large, heterogenous mass in the pelvis measuring 6.2 cm × 5.0 cm × 6.1 cm, with cystic areas and calcification within it (Figure 1).
Both kidneys were mildly hydronephrotic, predominantly on the right side (Figure 2). The urinary bladder was normal. There was no free fluid in the pelvis. The provisional diagnosis of a pelvic teratoma causing bilateral hydronephrosis was made. Blood investigation showed an elevated white cell count of $17.6 \times 10^3$/L. Urinalysis showed the presence of ketones, trace amounts of protein and 1–2 (0–1/HPF) red blood cells. Renal profile was normal. She was given intravenous antibiotics and referred to our centre for a second opinion and further management.

In our centre, she was afebrile with gradually improving urinary symptoms. Physical examination revealed no mass per abdomen. The abdomen was non-tender. Human chorionic gonadotropin (hCG) and Alpha-fetoprotein (AFP) levels were normal.

In view of possible pelvic malignancy, a contrast-enhanced CT (SOMATOM SENSATION16, Siemens, Forchheim, Germany) of the thorax, abdomen and pelvis was done. The scan parameters were as follows: Helical, 80 KV, 200 mA, slice thickness of 5.0 mm, and 50 ml of contrast media was injected intravenously without oral or rectal contrast.

A heterogeneous, enhancing, soft tissue mass was shown arising from the right side of the pelvis measuring 4.5 cm × 3.0 cm × 3.5 cm. Calcification was noted within it with no fat component and the surrounding bowel loops were poorly separated from the mass (Figure 3). The appendix was not visualised. There was minimal fluid in the Pouch of Douglas. The para-aortic and para-caval lymph nodes were not enlarged. The liver, pancreas and spleen were normal. There was very mild right-sided hydronephrosis, while the left kidney was normal. No abnormalities were noted within the thorax. The diagnosis of a possible intra-abdominal bowel-related mass instead of a pelvic malignancy was made based on the CT findings.

Laparotomy was performed, revealing a mass adherent to the bowel in the pelvis. Intra-operatively, an appendiceal mass due to a ruptured retroileal appendix was found. The appendix was situated at the retroileal region, inflamed, measuring 5.0 cm. The mass was removed and there were no immediate or late complications following surgery. Histology showed only inflammatory cells consistent with an appendiceal mass.

The patient was treated with intravenous metronidazole 180 mg TDS, Gentamicin 180 mg OD and Cloxacillin 360 mg QID for four days. The patient was discharged well on oral antibiotics for one week.

Follow-up ultrasound examination showed a lesser degree of hydronephrosis on the right side and that the left kidney was normal. One year following surgery, both kidneys were normal.

**DISCUSSION**

While acute appendicitis is a common condition affecting all age groups, it is more prevalent in childhood and early adolescence. It is the most common cause of emergency abdominal surgery in children and adolescents. The classical triad of abdominal pain, vomiting, and fever should always raise the question of appendicitis. Alvarado scoring is an established and proven method for the early diagnosis of acute appendicitis [1]. Based on her history, physical examination, and laboratory tests, the total score for this patient was six points, which was compatible with the
The atypical presentation of appendicitis as a disorder of the urinary tract, symptom of which include frequency, dysuria, anuria and urinary retention, is a relatively rare phenomenon. Urinary tract obstruction is an uncommon but well-recognised complication of appendicitis [18]. Urerteral obstruction typically occurs on the right side, with mild to moderate severity, due to localised peripendicular inflammation [18]. The most likely explanation is the direct extension of the inflammatory process across the thin layer of the posterior parietal peritoneum, resulting in a segmental ureteral ileus similar to the bowel ileus seen with peritonitis. Bilateral ureteral obstruction is uncommon and usually due to mechanical obstruction by an appendiceal abscess [19]. There are reported cases of appendicitis presenting with urinary symptoms, including acute urinary retention [20–22].

The initial diagnosis of a pelvic malignancy instead of an appendicular mass was based on the atypical presentation, the radiological finding of a pelvic mass with calcification, and the findings of bilateral hydropsiphrosis, which are very atypical of acute appendicitis. This was initially thought to be a teratoma causing bilateral hydropsiphrosis. However, the patient’s hCG and AFP levels were normal. As the CT was performed three weeks after the initial presentation and the patient treated with antibiotics, the bilateral hydropsiphrosis had improved. Laparotomy was indicated in this case and confirmed the diagnosis of an appendiceal mass masquerading as a pelvic tumour and causing bilateral hydropsiphrosis.

In conclusion, the varying atypical anatomic deviations of the inflamed appendix can involve neighbouring structures, including the right ureter, the urinary bladder, and sometimes the left ureter, and thus give rise to acute symptoms that mimic urinary tract infection and/or obstruction [23]. Furthermore, acute or chronic appendicitis in children may also mimic pelvic
malignancy clinically and radiologically. This should always be kept in mind by the radiologist and surgeon, in order to obtain the correct diagnosis and management.

REFERENCES

1. Alvarado A. A practical score for the early diagnosis of acute appendicitis. Ann Emerg Med 1986; 15(5):557–564.
2. Poulaert JB. Acute appendicitis: US evaluation using graded compression. Radiology 1986; 158(2):355–360.
3. Park NH, Oh HE, Park HJ and Park JY. Ultrasonography of normal and abnormal appendix in children. World J Radiol 2011; 3(4):85–91.
4. Wiersma F, Srámek A and Holscher HC. US features of the normal appendix and surrounding area in children. Radiology 2005; 235(5):1018–1022.
5. Toorenvliet BR, Wiersma F, Bakker RF, Merkus JW, Breslau PJ and Hamming JF. Routine ultrasound and limited computed tomography for the diagnosis of acute appendicitis. World J Surg 2010; 34(10):2278–2285.
6. Hennelly KE and Bachur R. Appendicitis update. Curr Opin Pediatr 2011; 23(3):281–285.
7. Hill BC, Johnson SC, Owens EK, Gerber JL and Senagore AJ. CT scan for suspected acute abdominal process: impact of combinations of IV, oral, and rectal contrast. World J Surg 2010; 34(4):699–703.
8. Choi D, Park H, Lee YR, Kook SH, Kim SK, Kwag HJ and Chung EC. The most useful findings for diagnosing acute appendicitis on contrast-enhanced helical CT. Acta Radiol 2003; 44(6):574–582.
9. Rao PM, Wittenberg J, McDowell RK, Rhea JT and Novelline RA. Appendicitis: use of arrowhead sign for diagnosis at CT. Radiology 1997; 202(2):363–366.
10. Neumayer L and Kennedy A. Imaging in appendicitis: a review with special emphasis on the treatment of women. Obstet Gynecol 2003; 102(6):1404–1409.
11. Doria AS, Moineedin R, Kellenberger CJ, Epelman M, Beyene J, Schuh S, Babyn PS and Dick PT. US or CT for diagnosis of appendicitis in children and adults? A meta-analysis. Radiology 2006; 241(1):83–94.
12. Xu Y, Wang J, Peng Y and Zeng J. CT characteristics of primary retroperitoneal neoplasms in children. Eur J Radiol 2010; 75(3):321–328.
13. Torbati SS and Krishel SJ. Dermoid tumor with ovarian torsion masking as appendicitis. J Emerg Med 2000; 18(1):103.
14. Tsai TC, Wong LY and Wu HP. Ovarian torsion caused by teratoma masquerading as perforated appendicitis in a 5-year-old girl. Pediatr Neonatol 2011; 52(1):51–54.
15. Baker JL, Gull S, Jesudason EC, Abernethy LJ and Losty PD. Appendicitis masquerading as malignancy. Arch Dis Child 2004; 89(5):481–482.
16. Hoorns MP, Easty M and McHugh K. Inflammatory appendix masses masquerading as pelvic tumours. Clin Radiol 2002; 57(1):70–73.
17. Gardikis S, Touloupidis S, Dimitriadis G, Limas C, Antypas S, Dolatzas T, Polychronidis A and Simopoulos C. Urological symptoms of acute appendicitis in childhood and early adolescence. Int Urol Nephrol 2002; 34(2):189–192.
18. Moncada R, Raffensperger J, Wasserman D and Freeark R. Hydronephrosis secondary to acute appendicitis in children. Pediatr Radiol 1974; 2(2):121–124.
19. Aronson DC, Moorman-Voestermans CG, Tiel-van Buul MM and Vos A. A rare complication of acute appendicitis: complete bilateral distal urethral obstruction. Lancet 1994; 344(8915):99–100.
20. Preece JM and Beverley DW. Acute urinary retention: an unusual presentation of acute appendicitis in a 3-year-old boy. Arch Dis Child 2001; 84(3):269.
21. Dever DP, Hulbert WC Jr, Emmens RW and Rabinowitz R. Appendiceal abscess masquerading as acute urinary retention in children. Urology 1985; 25(3):289–292.
22. Noble J, Culkin DJ, Willis S, Venable DD and Mata JA. Acute urinary retention in a child with appendiceal abscess: diagnostic dilemma. Urology 1990; 36(6):513–515.
23. Tiel-van Buul MM, Aronson DC, Groothoff JW, Van Baren R, Frenkel J and Van Royen EA. The role of renal scintigraphy in the diagnosis and follow-up of unilateral ATN after complete bilateral distal ureteral obstruction as a complication of acute appendicitis. Clin Nucl Med 1998; 23(3):141–145.