SHORT REPORT

Unusual bilateral obstructive uropathy with kidney failure in an adolescent with ulcerative colitis

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Abstract

Extrarenal manifestation and complications of inflammatory bowel disease may be detected in a significant number of patients. It is known that the genitourinary tract may be affected but data from childhood population are scarce. We present an unusual bilateral obstruction of ureters, inflammation of bladder wall and vesicoureteral reflux in a boy with ulcerative colitis. Obstructions led to recurrent acute kidney injury with need of surgical intervention to prevent kidney function deterioration. © 2011 European Crohn’s and Colitis Organisation. Published by Elsevier B.V. All rights reserved.

1. Introduction

Extrarenal manifestation and complications of inflammatory bowel disease (IBD) may be detected in a significant number of patients. As an autoimmune disease, IBD may affect joints, skin and eye. Due to multiorgan involvement and metabolic consequences, children with IBD may suffer from anemia, malnutrition with growth disorders, osteodystrophy, cholelithiasis and fatty liver. When the urinary tract is concerned, IBD induces mostly nephrolithiasis (2–6% patients), ureteral obstruction and glomerulopathy.1 Additionally, autoimmune processes may induce secondary changes in renal parenchyma – glomerulonephritis or interstitial nephritis.1,2

The genitourinary tract is located closely to the gastrointestinal tract and therefore may be affected in a significant number of cases (0.3–25%).2–4 Fistulas between the bladder or ureters and obstructive uropathy were described earlier, though their incidence in the case of Crohn’s disease is higher.2–4 In children population, obstructive uropathy has not been described as frequently as in adults. On the other hand, drugs prescribed for IBD may cause direct or indirect damage to the urinary tract.5 The case we present describes difficulties in the diagnosis and treatment of rare bilateral secondary obstructive uropathy in an adolescent with ulcerative colitis.

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2. Case report

A fifteen-year-old boy with ulcerative colitis was admitted to the hospital because of loin and abdominal pain and gross hematuria. IBD was diagnosed three years before based on repeated colonoscopy and histopathology. The rate of relapse within this period of time was not high (1–2 relapses/year). Before admission, he was treated orally with mesalazine and azathioprine (100 mg/day)

Initial investigation showed normal renal function (eGFR, 165 ml/min/1.73), elevated CRP (95 mg/l), proteinuria (450 mg/dl) and hematuria (erythrocytes covered high power field). Stools were normal, without blood; urine culture negative. Kidneys were normal on ultrasound with the presence of a small stone (3–4 mm) on the left. Both ureters were slightly widened. The boy was treated as renal colic due to kidney stones with a significant improvement and then discharged home (Table 1).

His clinical complaints recurred within 3 weeks in the form of abdominal pain and erythrocyturia. Ultrasound showed a thickened bladder wall and ureters dilated by 6 mm. Urography revealed no stones; bilateral renal function was well preserved; the passage of urine was slightly slowed, without clear obstruction. Cystography showed vesico-ureteral reflux (grade III) to the right kidney and a low bladder volume (130 ml).

After this procedure, the patient developed a urinary tract infection and a flare of colitis. The antimicrobial therapy was implemented and oral steroids added to the standard treatment of IBD. Clinical complaints were intermittent; eGFR was normal; urinalysis — proteinuria, leukocyturia and proteinuria of 0.62 g/l. Dilatation of the urinary tract was still present.

Cystoscopy was performed and showed normal ureteral orifices and a changed, inflamed bladder wall (mucosa with leukocyte inflammation). Tuberculosis and fungal infection were excluded. A urodynamic study revealed a decreased volume of the bladder with low filling pressure. The patient was put on a chronic antibiotic treatment and discharged home.

Within two weeks the patient was admitted again due to severe abdominal pain, dysuria and oliguria. We observed an elevated level of serum creatinine (6.8 mg/dl – eGFR – 20 ml/min/1.73 BSA) and urea (120 mg/dl), as well as anemia (hgb 10.8 g/dl). Acute kidney failure was diagnosed. After catheterization of the bladder, oliguria resolved and the renal function test decreased to eGFR of 64/min/1.73 BSA. Proteinuria and hematuria persisted. Patient was tested for amyloid in rectal mucosa (negative). The steroid dose was increased because of suspected acute interstitial nephritis.

After two weeks of improvement, before control colonoscopy, acute renal failure relapsed with eGFR of 35 ml/min/1.73 BSA. Conservative treatment gave no effect. Dynamic renal scintigraphy (MAG3) gave a result of symmetrical kidney function with parenchymal retention and slightly slower urine flow. Due to inconsistent images from ultrasound and scintigraphy, a magnetic resonance study was conducted. Surprisingly, bilateral ureteral stenosis within a distance of 10 cm over the bladder was detected. The family was given an option of performing bilateral ureterocutaneostomy but refused due to slight clinical improvement and quality of life issues. However, during the next increase of serum creatinine they changed their decision and the procedure was done for the right ureter. After the procedure, kidney function improved significantly over 90 ml/min/1.73, proteinuria and erythrocyturia disappeared (Fig. 1).

<table>
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<th>Table 1</th>
<th>Initial radiologic evaluation when obstructive uropathy was suspected.</th>
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<td>Investigation</td>
<td>Description</td>
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<td>Urography</td>
<td>Plain X-ray showed no stones in the abdominal cavity. Both kidneys excrete contrast AT simultaneously with similar concentration. Kidney shape smooth. Renal parenchyma preserved. Both renal pelvices slightly enlarged. Both ureters contrasted at whole length with slight dilatation. At the level of L3 slight stenosis of right ureter – compression by the vessel? Contrast flow not disturbed. In the pictures after 20 min and 60 min – residual volume in the bladder with changed bladder wall.</td>
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<td>Cystography</td>
<td>After infusion of 130 ml of contrast media a urinary bladder with diminished capacity was seen. A right vesico-ureteral reflux grade III was detected.</td>
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<td>Urodynamic evaluation</td>
<td>Conclusions: urinary bladder of diminished capacity (320 ml) with low intravesical pressure. No micturation during the investigation. Both kidneys located in the lumbar region excreted simultaneously. Relative kidney function: LK — 45% and RK — 55%. Typical shape, homogenous distribution of contrast. After 20 min significant contrast retention in the parenchyma (renal failure) – both curves of cumulative shape. No effect after administration of furosemide. After 45 min, parenchyma retention present but contrast flow to the bladder preserved. No retention in renal pelvis of ureters.</td>
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<td>Kidney dynamic scintigraphy (MAG3)</td>
<td>Magnetic resonance study Bilateral significant dilatation of renal pelvis and ureters down to 3–4 cm below crossing with iliac arteries (width of ureters 18–20 mm). No inflammation in surrounding tissue. Both ureters stenosed for 1–2 cm – resembling inflammation or sclerosis. Below stenosis both ureters are 2–3 mm wide and smooth in shape. Ureteral orifices without pathological changes. Bladder wall smooth. Prostate normal in shape and structure.</td>
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Double J catheter into the left renal pelvis was introduced temporarily but after several weeks clotted and had to be removed. The patient was maintained on steroids, back on mesalazine with no clinical relapse of IBD. Clinical complaints did occur, but the left renal pelvis got dilated again. Repeated renography showed preserved function of the right kidney (90%) and decreased function of the left one (10%). On MRI left ureters were stenosed at the same level as previously. Ureterocutaneostomy of the left ureter was implemented, but the function of the left kidney did not recover.

3. Discussion

The urinary complications of IBD are described with frequency of 6–25% of cases.2–4,6,7 Data on this problem are available mostly from studies conducted on adults; data concerning children are scarce, e.g., Makosie and colleagues described an increased incidence of urolithiasis in the population of children with IBD.8,9

Inflammatory processes of the bowel may affect the urinary tract by direct and close contact. Fistulas to the ureter or bladder are usually observed in Crohn's disease, because ulcerative colitis does not form fistulas.10 When present, fistulas may lead to pneumaturia, dysuria, recurrent infections, and fecaluria.10 At the moment, in most cases, the non-satisfactory response to medical therapy makes surgery the best option.3 In our case, the presence of fistulas was excluded by radiologic evaluation and cystoscopy.

Obstruction often occurs when inflammation causes scars and adhesion, but mostly jejunum is concerned. In our case, the presence of obstruction just 10 cm bilaterally over the bladder and with direct bladder wall infiltration strongly suggests localization in the cecum and terminal part of colon. Concomitant changes in the bladder resulted in vesico-ureteral reflux. That unusual finding made the final diagnosis delayed. Usually, changes in lower urinary tract and both ureters may arise due to an abscess or retroperitoneal fibrosis.10,11 In the case we describe, no such changes were detected.

As reported before, the drugs prescribed for IBD may cause direct or indirect kidney injury. Mesalazine may precipitate in the urinary tract or induce acute interstitial nephritis.9 Glucocorticosteroids make patients prone to stone formation.2 Both of these reasons were excluded in our case.

The treatment of obstructive uropathy in cases with IBD comprises: temporary stenting of ureters, surgical release of the ureters with the removal of adhesions, and finally artificial ways of urine flow (cystostomy, ureterocutaneostomy). The aim of surgical intervention is to enable free urine flow, preventing renal parenchyma damage. Persisting complete uropathy leads to temporary or permanent loss of glomerular filtration rate. Hematuria, proteinuria and leukocyturia in the urine may resemble a urinary tract infection or kidney stones. On the other hand, a urinary tract infection and forming calculi may accompany the obstruction.

As was described earlier, ureteral obstruction is usually quite occult.10 In the case we describe, clinical complaints mimicked all three clinical entities: obstruction, kidney stone or urinary tract infection. Step-by-step radiologic imaging led us to the final diagnosis. However, initial scans of urography and renography were misleading, showing no definite obstruction. MRI evaluation directed on processes located in pelvis finally showed an unusual location of stenosis.

The unusual place of obstruction caused the failure of stenting with the success of surgical ureterostomy. Fortunately enough, the overall kidney function was preserved, but the injury of the left kidney persisted with 10% of filtration function.

To summarize, although complications from the urinary tract are often detected in the course of inflammatory bowel disease, we present a case of unusual bilateral ureteral obstruction occurring in a child with colitis ulcerosa. Occult beginning of the disease and coexisting multiple complications may mislead the initial diagnosis and cause serious consequences to the renal parenchyma.

Conflict of interest

There was no financial conflict of interest for any author involved.

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All authors have made substantial contributions to all of the following: (1) the concept and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, and (3) final approval of the version to be submitted.

The manuscript, including related data, figures and tables, has not been previously published and is not under consideration elsewhere.

References


