ABSTRACT

Encrusted uropathy is a subacute to chronic inflammatory disorder characterized by mucosal and submucosal encrustations in the wall of the urinary tract. Encrusted cystitis, pyelitis, and pyelocystitis are well-known entities. A rare manifestation of incrustation of the entire ileal loop in a patient with an ileal conduit urinary diversion is presented.

Teaching point: Encrusted uropathy may affect the entire urinary tract, including the upper urinary tract, bladder, and urinary diversion.
CASE REPORT

An 83-year-old male with a history of diabetes and cystectomy with ileal conduit urinary diversion for a muscle-invasive bladder carcinoma showed progressive dilatation of the left collecting system and impaired renal function. An abdominal computed tomography (CT) did not reveal an obstructive cause and no calcifications of the ileal conduit (Figure 1).

A unilateral DJ-stent on the left side was inserted. Because of an episode of painless gross hematuria (1 year later), he was referred for a CT scan of the abdomen.

An axial non-enhanced CT abdomen (Figure 2a) shows curvilinear calcifications at the luminal side of the ileal conduit in the right iliac fossa and thickening of the wall of the conduit (white arrows). The tip of the DJ-stent is visible near the proximal end of the conduit (yellow arrow). A coronal (Figure 2b) reformatted image and maximal intensity projection (MIP) (Figure 2c) demonstrate curvilinear calcifications at the luminal side of the ileal conduit in the right lower abdominal quadrant. Thickening of the bowel wall (white arrows) can be appreciated by comparing it with the adjacent small bowel loop.

A 3D-reformatted image without (Figure 3a) and with bone extraction (Figure 3b) illustrates the long tube-like
calcifications in the ileal conduit (white arrow) and the DJ-stent in the left ureter (yellow arrow).

DISCUSSION

Encrusted uropathy is a subacute to chronic inflammatory disorder characterized by encrustations in the wall of the urinary tract with severe adjacent inflammation [1, 2]. The urothelial deposition consists of struvite and carbonated apatite, resulting in encrustations and ulceronecrotic inflammation of the epithelium and surrounding tissues.

Urothelial alkaline encrusted cystitis (bladder), encrusted pyelitis, and encrusted pyelocystitis occur in 4% to 16% of patients with urease-producing bacteria [2, 3, 4]. A male predominance and a mean age of 50 to 71 years are reported [2]. However, mucosal and submucosal encrustations of the ileal conduit for urinary diversion are extremely rare.

Risk factors include diabetes mellitus, immunosuppression (up to 3% of renal transplants develop encrusted uropathy), previous urological procedures, and chronic broad-spectrum antibiotic therapy [2, 5]. The urea-splitting *Corynebacterium urealyticum* group is nearly exclusively associated with this disease. *Arcanobacterium pyogenes* has also been reported as a cause of encrusted pyelitis [3]. High urinary pH and negative conventional urine cultures should raise suspicion of the diagnosis [5].

Calcifications in an ileal conduit for urinary diversion are not uncommon [2]. Calcifications on foreign material (staples, sutures) at the proximal end of the ileal conduit are more frequently seen on CT-imaging. Calculi in the lumen of the conduit exist as well. Encrustations on indwelling stents frequently occur and may largely complicate the removal and changing of the stents.

A non-contrast abdominal CT scan is the imaging method of choice because of an excellent capability for the detection of mucosal or submucosal calcifications and bowel wall thickening [1, 2]. Intravenous administration of contrast medium is not necessary for the diagnosis [1]. Encrusting uropathy most commonly occurs in the renal collecting system and the bladder, rarely in a urinary diversion [1, 2].

Endoscopy can confirm the inflamed mucosa and the almost circumferential rough protruding calcifications (Figure 4). It gives the opportunity for a biopsy to confirm mucosal inflammation, necrosis, and luminal calcifications [2].

Early diagnosis is important for prognosis, and a delay in treatment correlates with a poor prognosis [1]. Local and oral urinary acidification in combination with long-term appropriate antibiotic therapy (glycopeptides) is the mainstay treatment [1, 4, 5]. Acidification of urine aims to dissolve the calcified encrustations and contributes to preventing hypersaturation of calcium salts in alkaline urine [1, 2]. Its therapeutic action is synergistic with that of antibiotics [1].

Endoscopic removal of encrustations can be performed, but it is invasive and should be performed only in cases of failure of medical therapy [1].

CONCLUSION

Encrusted uropathy is a subacute to chronic inflammatory disorder characterized by (sub-)urothelial encrustations and may affect the entire urological tract, including an ileal loop diversion.
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REFERENCES


