Inflammatory Diseases of the Ureter

P. Chemla, T. Smayra, L. Bouchard, M. Mazerolles, Ph. Otal, N. Grenier, F. Joffre

CONTENTS

7.1 Ureteral Tuberculosis 155
  7.1.1 Imaging 156
  7.1.1.1 The Abdominal X-ray 156
  7.1.1.2 EU 157
  7.1.1.3 Direct Opacification Techniques 158
  7.1.1.4 CT Scanning 159
  7.1.2 Role of Radiology 161
  7.2 Ureteral Bilharziosis 161
    7.2.1 Imaging 162
    7.2.1.1 KUB, EU, and Retrograde Cystography 162
    7.2.1.2 Ultrasonography 164
    7.2.1.3 CT Scan 164
  7.2.2 Role of Radiology 164
  7.3 Other Inflammatory Conditions of the Ureter 165
    7.3.1 Primitive Ureteritis 165
    7.3.2 Stenosing Ureteritis 165
    7.3.3 Emphysematous Ureteritis 168
    7.3.4 Ureteral Striations 168
    7.3.5 Secondary Ureteritis 170
    7.3.6 Other Ureteral Thickening 170
    7.4 Ureteritis Cystica 170
    7.5 Ureteral Malakoplakia 173
    7.6 Ureteral Involvement in Collagenosis 174
    References 176

Inflammatory diseases of the ureter include a wide range of disparate lesions, mainly the result of the presence in the urine of an infectious organism, more rarely by hematogenous spread from a distant site or contiguous organs (kidney, bladder, digestive tract).

Ureteral involvement is mostly a secondary problem related to inflammatory lesions of the kidney or bladder. In some cases the ureteral lesion is the most important lesion, which requires direct treatment to avoid deleterious effects on the renal parenchyma.

The ureter responds to inflammation with some common abnormalities: loss of contraction and hypotonia, mural thickening by edema and cell infiltration, ulceration, pseudo-diverticula, cystic degeneration, and desmoplastic reaction leading to narrowing and obstruction (Wasserma 1996).

Intravenous and retrograde pyelography, cystography, and CT scanning are the main contributory imaging methods.

7.1 Ureteral Tuberculosis

Genitourinary tuberculosis has become relatively rare but remains second in frequency after pulmonary disease. Urinary tract disease is secondary to pulmonary tuberculosis, but pulmonary disease is evident in only about 30% of cases (Elkin 1990). The incidence is currently rising due to the progress of HIV infection.

Finding ureteral involvement is of great clinical importance, as much for the prognosis as for therapeutic choices. It automatically indicates renal disease and must raise the suspicion of bladder involvement. In the course of the disease, ureteral involvement is, together with renal pelvis and bladder lesions, one of the major threats to renal function. Ureteral involvement is of variable extent.

Ureteral localization of tuberculosis is in fact a major step of this disease, almost always secondary to already advanced renal involvement. Less frequently, it is secondary to direct hematogenous spread or to a contiguous lesion such as ovarian disease (Friedenberg 1971). It must be differentiated from ureteral external compression by a paravertebral abscess evolving along the psoas muscle (Dufour 1973). On the other hand, diffuse ureteral dilation can also be found without a ureteral lesion in the presence of inflammatory or sclerotic bladder disease responsible for a stenosis or reflux.

The incidence of ureteral involvement in tuberculosis varies widely, according to the literature,
between 5% and 37% (Rees and Hollands 1970; Claridge 1970). Lavasse found 20% ureteral involvement in 1647 cases of urinary tuberculosis (Lavasse 1969). Predominant ureteral lesions are situated in the lower third (70%–85%) (Gow 1986). Pyeloureteral junction involvement is less frequent, but it is more often found when there is renal pelvis disease (O’Reilly 1986). A multifocal lesion is possible in about 27% of cases (Claridge 1970).

Frequently, the ureteral lesion, mainly stenosing, comes within the context of an already known tuberculous disease or of presenting lesions in favor of this diagnosis. In this situation, imaging plays an important part in diagnosis. Microbiological investigation is, however, always essential to confirm the diagnosis.

 Sometimes, ureteral involvement is characterized by an isolated stenosis without any specific pattern and no other apparent lesion. Opacification techniques are then insufficient for diagnosis, which can be made by histopathological examination of the surgical specimen (Dufour 1973).

Ureteral disease appears following an “open” papillolocaliceal lesion in the excretory system. It spreads essentially throughout the urinary tract. Spreading via the ureteral lymphatic system is not currently accepted by the majority of authors (Caine 1967). The two types of anatomical lesions characteristic of urinary tuberculosis are found in the ureter. Specific lesions, secondary to inflammation, are characterized pathologically by a granulomatous cellular infiltration of the submucosa, associated with important parietal edema and ureteral hypotonia. Ulcerations are frequent, multiple and longitudinal, along the axis of the ureter. They disappear with medical treatment. In fact, during this inflammatory phase, the disease often remains clinically silent and diagnosis is made later when signs of obstruction appear (Wasserman 1996). These inflammatory lesions are in fact reversible but, if medical treatment is delayed, scar fibrosis appears rapidly, evolving on its own even with specific treatment (Wasserman 1996). These lesions end up in more or less diffuse stenosis and longitudinal retraction of the ureter. Ureteral tuberculosis is always associated with renal lesions, whether obvious or not. In exceptional cases, there is diffuse ureteral involvement associated most frequently with a mastic kidney, entirely destroyed and calcified.

7.1.1 Imaging

Classically, intravenous pyelography (EU) is the examination of choice to detect tuberculous ureteral involvement (Friedenberg et al. 1968). In case of renal dysfunction preventing optimal opacification of the ureter, antegrade and/or retrograde opacification techniques allow better display of the lesion. The current use of CT provides helpful information in difficult cases, particularly with mute kidney.

7.1.1.1 The Abdominal X-ray

The abdominal X-ray (KUB) is most frequently normal. Exceptionally, in “historical” tuberculosis cases, there are linear, vertical, or most frequently patchy or lumpy calcifications in the ureteral topography, mainly in its proximal part (Fig. 7.1). Calcifications indicate, in the majority of cases, quite advanced renal disease. However, Birnbaum et al. (1990) reported on a case of diffuse calcified ureteritis without any underlying major lesion. These calcifications raise essentially the diagnosis of ureteral bilharziosis, where the lesions are more distal and appear as linear calcifications in the dilated wall of the ureter (Hartman et al. 1977). In addition, in tuberculosis the ureter is often stenotic while in bilharziosis it is dilated. More exceptionally, amyloid ureteral disease can be discussed, but there is classi-