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The "maiden waist" sign of the ureters

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The fibrotic plaque associated with retroperitoneal fibrosis (RPF) is usually centered at the lumbosacral junction, often surrounding the abdominal aorta, inferior vena cava, and iliac vessels at this level [1]. The fibrotic process can also involve the ureters, where they may be drawn medially, resulting in an alteration of the normal ureteral course. When both ureters are involved, the more medial position of the opacified mid to lower ureters as seen on excretory urography (EXU), as well as CT or MR urography (Fig. 1), is said to ascribe the "figure" of a narrow-waisted maiden (Fig. 2) [2]. In addition to medial deviation, the fibrotic plaque may produce tapered narrowing of the lumen of one or both ureters in the lower lumbar or upper sacral region. The ureteral narrowing is associated with a variable degree of unilateral or bilateral hydroureteronephrosis, often with delayed excretion of contrast material (Fig. 3a, b) [3].

The majority of cases of RPF are idiopathic where the condition may be referred to as Ormond's disease [4]. Etiologies known to be associated with development of RPF

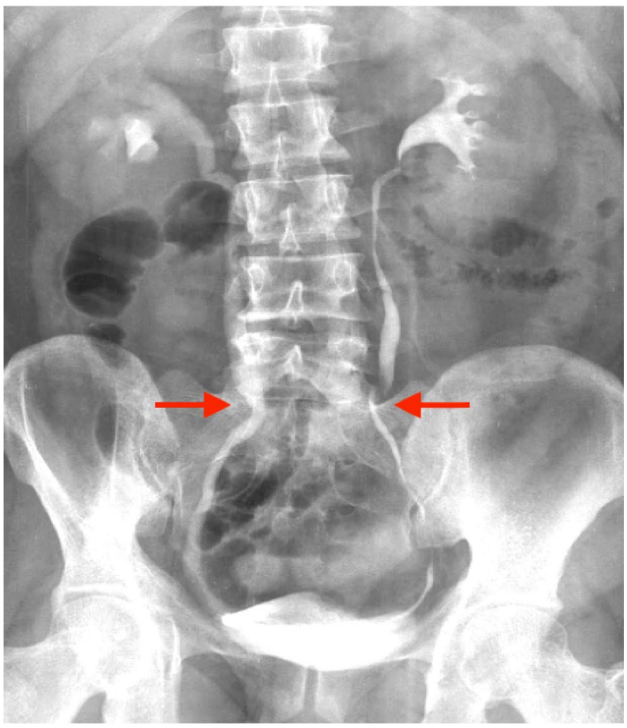

Fig. 1 A 30-min image from an EXU performed on a patient with retroperitoneal fibrosis demonstrates medial deviation (red arrows), and narrowing of both the ureters in lumbosacral junction giving a characteristic "maiden-waist" deformity

Fig. 2 A maiden with a narrowed waist! (https://commons.wikimedia.org/wiki/File:Invigorator_corsets1893.gif#/media/File:Invigorator_corsets1893.gif) accessed November 14, 2018 (Public domain)

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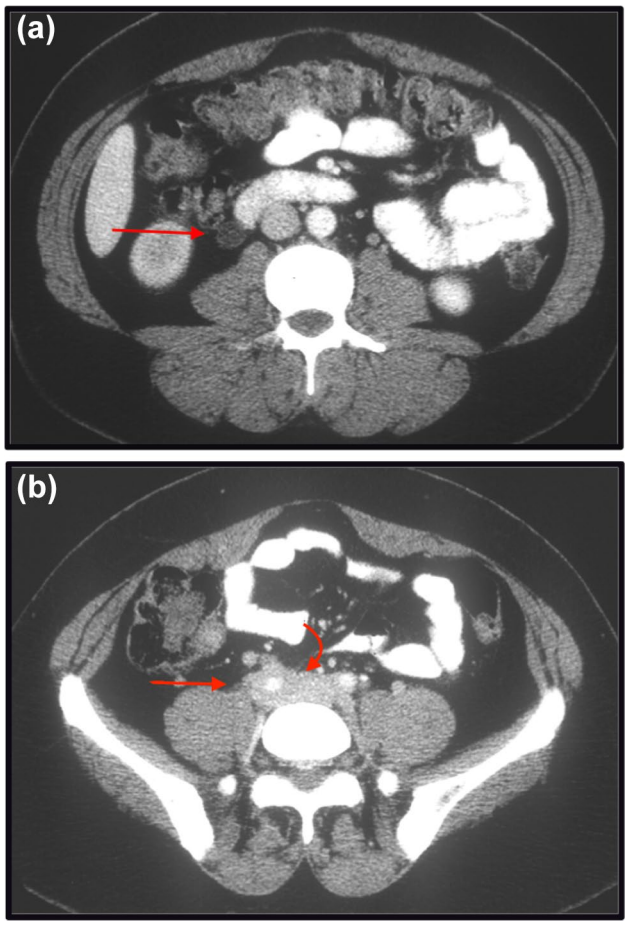

Fig. 3 CT images from another patient with RPF reveal moderate dilatation of the right ureter (red arrow) below the lower margin of the right kidney (**a**). An image obtained at a lower level shows the plaque encompassing the vessels (red curved arrow) and the right ureter just at the edge of the plaque (red straight arrow) (**b**)

include certain drugs, malignancy, infection, vascular and autoimmune disease [1]. The condition has a good prognosis, if promptly diagnosed and treated. Conventionally the approach to the treatment of RPF has been surgical, but after initial relief of urinary tract obstruction, medical strategies using steroids, Tamoxifen, and immunosuppression have shown favorable results [5].

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Research involving human and animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

References

1. Caiafa RO, Vinuesa AS, Izquierdo RS, et al. (2013) Retroperitoneal fibrosis: role of imaging in diagnosis and follow-up. RadioGraphics 33:535–552
2. Arger PH, Stolz JI, Miller WT (1973) Retroperitoneal fibrosis: an analysis of the clinical spectrum and roentgenographic signs. AJR 119:812–821
3. Dyer RB, Chen MY, Zagoria RJ (2004) Classic signs in uroradiology. RadioGraphics 24:S247–S280
4. Ormond JK (1948) Bilateral ureteral obstruction due to envelopment and compression by an inflammatory retroperitoneal process. J Urol 59:1072–1079
5. Jadhav KK, Kumar V, Punatar CB, Joshi VS, Sagade SN (2017) Retroperitoneal fibrosis-clinical presentation and outcome analysis from urological perspective. Investig Clin Urol 58:371–377