Dysuria

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Christoph A.J. von Klot

2.1 Definition

In the field of urology, dysuria is used in slightly varying ways and includes difficulties during urination up to a painful or burning sensation during voiding. Dysuria can have a variety of underlying medical conditions, the most common of which at young age is urinary tract infection that occurs mostly in adolescent women. Older patients mostly tend to have dysuria due to benign prostate hyperplasia; therefore, dysuria in the elderly population mostly occurs in the male population.

2.2 Medical History

The medical history should include the length of dysuric symptom as well as type of onset, i.e. sudden or gradual. Concomitant symptoms suggestive of infection, such as fever, flank pain, chills, burning sensation and urethral discharge, should be assessed. Patients with dysuria should be asked about the occurrence of gross haematuria. Voiding function should be evaluated with questions in accordance with the International Prostate Symptom Score (IPSS): feeling of incomplete bladder emptying, frequency, urgency, weak stream, straining, nocturia and intermittency. Also an orientation about the past medical history needs to be obtained focussing on trauma to the pelvis or urethra, previous infections especially urethritis and urinary tract infections in general and surgery of the lower urinary tract. The medical history should also include a thorough look on vegetative symptoms, signs of depression,

C.A.J. von Klot
Department of Urology and Urological Oncology, Hannover University Medical School, Carl-Neuberg-Str. 1, Hannover 30625, Germany
e-mail: klot.christoph@mh-hannover.de

A.S. Merseburger et al. (eds.), *Urology at a Glance*,
DOI 10.1007/978-3-642-54859-8_2, © Springer-Verlag Berlin Heidelberg 2014

bowel irregularities and the neurological status. Finally the complete list of current medication needs to be obtained and correlation of symptoms with food or medication intake tested.

2.3 Diagnostics

Since the symptom of dysuria is highly variable and unspecific, a vast selection of diagnostic tools may be applied depending on patient age, medical history and clinical findings.

Acute dysuria together with urgency and frequency hints towards a urinary tract infection. Diagnostics include urine dipstick testing and a physical examination with the focus on the suprapubic bladder and flank region. Further testing including urine sediment, urine culture or a sterile catheter specimen of urine may be warranted if diagnosis is unclear. Further workup for recurrent infections is advised.

Itching and tingling sensation with or without urethral discharge may be symptoms of urethritis. First morning urine shows at least ten white blood cells per high-power field in urine sediment. Diagnostic tools include physical examination for lymphadenopathy, ulcers and urethral discharge on palpation of the urethra. Urethral swabs should be subjected to a microbiological examination [1]. A lot of patients with negatively tested lab results respond to antibiotic treatment suggesting initial false-negative tests.

Dysuric symptoms, pain during defaecation and a painful digital rectal examination may be signs of prostatitis. Diagnosis of prostatitis may be challenging since symptoms are highly variable and range from severe febrile infection to a clinically completely asymptomatic course. Symptoms can be assessed using the validated Chronic Prostatitis Symptom Score (NIH-CPSI). When prostatitis is suspected, the workup includes the following: testing for post-void residual volume, digital rectal examination and ultrasound of the prostate, PSA measurement, urine sediment and urine microbiological testing, uroflowmetry and separate testing of initially voided urine, midstream urine, expressed prostatic secretion after prostatic massage and urine after prostatic massage. Testing may be reduced to midstream urine plus urine after prostatic massage as more cost-efficient test [2, 3].

Dysuria in conjunction with signs of voiding dysfunction in the absence of infection is indicative of lower urinary tract obstruction. Diagnostics include an IPSS Score, bladder diary, measurement of residual urine and uroflowmetry, bladder wall thickness and a digital rectal examination in men.

A variety of clinical causes of obstruction can be identified on physical examination such as meatal stenosis, lichen sclerosus, palpable prostate cancer phimosis and anatomical abnormalities. Filling cystometry and pressure-flow measurement are not mandatory. A urodynamic evaluation for benign prostatic hyperplasia should however be undertaken in a certain subset of patients: voided volume $\leq$150 ml, patient age <50 or >80 years, post-void residual volume

>300 ml, suspicion of neurological disease, previous pelvic surgery, patients with previous unsuccessful invasive treatment, bilateral hydronephrosis and patients with a maximum flow rate of more than 15 ml/s on uroflowmetry. Patients with suspicion of lower urinary tract obstruction should be checked for sequelae of bladder outlet obstruction including reduced renal function, hydronephrosis, infection, bladder diverticula and bladder calculus [4].

For bladder outlet obstruction, causes other than benign prostate enlargement have to be considered. A none bell-shaped plateau curve in uroflowmetry may hint towards meatal stenosis or urethral stricture. In this case, a retrograde urethrogram and urethrocystoscopy can be applied to clarify urethral anomalies and can also identify foreign bodies of the urethra and urinary bladder.

In dysuria especially in conjunction with gross haematuria or microhaematuria without infection, malignancy must be ruled out. In men > age 40 years, a digital rectal examination and PSA value are performed. Urethral and bladder cancer should be examined via urethrocystoscopy. If diagnosis is unclear, bladder washout cytology and biopsy may be performed [5–7].

Pathology of the upper urinary tract usually does not typically cause dysuria as a symptom. However, diagnostics of the upper urinary tract, i.e. retrograde or IV pyelography and upper urinary tract cytology, must be included when malignancy cannot be ruled out or the cause of haematuria is unclear. Imaging of the upper urinary tract may reveal a lower ureteric stone which can cause dysuric symptoms.

In women with dysuric symptoms, gynaecological workup may be necessary to reveal specific causes of dysuria in the female population. Vaginitis may be caused by bacterial infection and fungal infection, and allergic or atrophic vaginitis may be due to oestrogen deficiency. Patients need to be evaluated for vaginal discharge, vaginal irritation, itching, redness, dyspareunia and dysuria. Gynaecological workup includes pH testing, cytology and microscopic evaluation as well as a vaginal examination [8].

Endometriosis as the first clinical manifestation in the urinary tract is rare. If the urinary tract is involved, the most common site is the urinary bladder. Diagnostic workup is usually initiated due to dysuria and predominantly urgency and frequency with concomitant haematuria in premenopausal women. Endovesical endometriosis is confirmed by cystoscopic examination with histological confirmation of suspicious lesions of the bladder mucosa [9].

Another cause of dysuria may lie in the diagnosis of bladder pain syndrome/interstitial cystitis (BPS/IC). No specific test is able to reliably identify BPS/IC as such. The diagnosis of BPS/IC is therefore mainly one of exclusion. Hydrodistention of the bladder wall with occurrence of small petechial haemorrhages may be helpful but is not specific as are the so-called Hunner ulcers which can be found in less than 50 % of patients with BPS/IC. Today IC is referred to as the typical clinic entity with Hunner ulcers and inflammation while BPS includes a wider range of clinical findings. Diagnosis is based on the 'International Society for the Study of BPS' (ESSIC) [10] (Fig. 2.1).

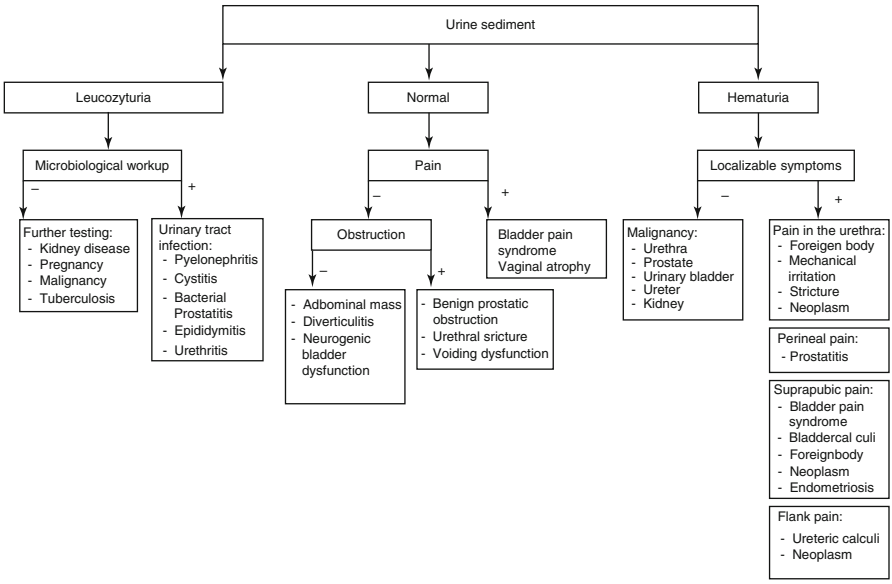

Fig. 2.1 Clinical decision making for diagnostic tests in patients with dysuric symptoms

2.4 Differential Diagnosis

Since dysuria is described as a symptom and not the underlying disease, we do not discuss the aspect of differential diagnoses; however, aside from the above-mentioned diagnostic considerations, a variety of secondary clinical conditions and rare conditions can cause dysuric symptoms. Among these are:

- Drugs and chemical irritants such as hygiene sprays, soaps, or even toilet paper
- Mass in the abdomen or diverticulitis
- Reactive arthritis with urethritis/Reiter's syndrome with urethritis as a sequela
- Psychogenic disorders and somatization disorders
- Mechanical irritation after physical activities: horseback riding and bicycling
- Adenovirus, herpesvirus and *Schistosoma haematobium*

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