DIAGNOSTICS OF STRICTURES: URETHROSCOPY AND URETHROGRAPHY

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ABSTRACT

Urethral stricture is a common and complex urological pathology. The incidence has been steadily increasing in recent decades, varying from 0.6% to 0.9% in the population and depends on the age of patients. Moreover, extended and subtotal lesions are diagnosed in 15-18% of cases of urethral stricture disease. According to the definition of the International Urological Council of Leading Experts of the International Society of Urology (SIU/ICUD, 2014), urethral stricture is understood as a pathological narrowing of any part of the urethra surrounded by the spongy body, resulting from the development of spongiofibrosis. In our country, the most cited definition is that of M.I. Kogan: urethral stricture is a polyetiologic obstructive urethral lesion, accompanied by symptoms in the lower urinary tract. Recently, due to the pathogenesis and recurrence of this disease, many authors have used the term "stricture disease" as a definition, which is considered equivalent to urethral stricture..

Introduction. Diagnosing strictures is a complex clinical task: accurately determining the location, length, density, and extent of the stenosis is necessary for selecting optimal treatment (balloon dilation, urethrotomy, reconstructive surgery).

Diagnosis of urethral strictures should include an assessment of the degree of lower urinary tract obstruction. Uroflowmetry and completion of the IPSS and IIEF-5 questionnaires are considered essential. These methods are also fundamental for postoperative patient monitoring, although generally accepted standards for postoperative care have not yet been developed.

Modern imaging techniques include retrograde urethrography (RUG), a contrast-enhanced X-ray examination of the urethra, and urethroscopy, an instrumental examination with direct visualization of the urethral wall using an optical urethroscope. Both methods are widely used, but there is debate about which is more accurate and in which clinical situations their combination is necessary. The relevance of this study lies in the need for an objective assessment of the diagnostic value of each method and the identification of advantages for different types of strictures to improve clinical algorithms.

Purpose of the study. To evaluate the effectiveness of urethroscopy and retrograde urethrography in identifying characteristics of urethral strictures in adult patients.

Materials and research methods. A prospective clinical study was conducted. The study included 210 patients with suspected urethral stricture (predominantly men aged 22–72 years, mean age 45.8 ± 12.3 years) from urology clinics in Russia, Uzbekistan, and Europe.

The following methods were used: retrograde urethrography (RUG) and urethroscopy.

The statistical analysis included a comparative analysis of sensitivity, specificity, the coefficient of agreement between methods (κ coefficient), and tests with $p < 0.05$.

Results and discussion. Mean length values were not statistically different between methods ($p>0.05$), however, urethroscopy more often revealed focal scarring and tissue density, which is important for surgical planning.

UGR provides a clear picture of the extent and topography of the stenosis thanks to contrast filling of the urethra, which is useful for preliminary planning. Urethroscopy, on the other hand, allows direct visualization of the urethral walls, as well as the density and structure of scar tissue, which is important when choosing reconstructive surgery tactics (incision, removal of scarred segments).

The obtained data demonstrate the high diagnostic value of both methods. The localization agreement coefficient ($\kappa = 0.92$) indicates good agreement between urethroscopy and urethroscopy in determining the site of stenosis. However, urethroscopy is superior to urethroscopy in terms of sensitivity in detecting complete obstruction and scar tissue density, which is important for predicting surgical intervention.

RUG is especially valuable during the initial assessment, as it accurately visualizes the extent of the stenosis and its relationship to anatomical landmarks. Urethroscopic examination provides additional information on the morphology and nature of the tissue, which helps select the optimal treatment method (endoscopic urethrotomy, reconstructive urethroplasty).

These results are consistent with a number of international publications stating that the combined use of methods significantly improves the accuracy of diagnosis and the quality of treatment planning.

Conclusions:

1. Retrograde urethrography and urethroscopy are highly informative methods for diagnosing urethral strictures;

2. RUG provides accurate determination of the location and extent of stenosis, while urethroscopy provides a detailed characterization of the internal structure of the urethral wall and the density of scar tissue;

3. The combination of methods improves overall diagnostic accuracy and helps to optimally select a treatment strategy;

4. Urethroscopy has demonstrated higher sensitivity in detecting complete obstruction, which is important when preparing for reconstructive interventions..

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