

## **Uretrocystography Radiography with Urethra Stricture Study at the Adam Malik Hajj Center General Hospital Medan**

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### **ABSTRACT**

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Urethral stricture is a narrowing of the urethra caused by scar tissue (fibrosis) which leads to obstruction of the urinary tract with potentially serious consequences for the urinary tract. Urethral stricture can cause symptoms of urinary obstruction and irritation that ultimately damage the kidneys. In this writing, the projections used are Anteroposterior (AP) and Right Posterior Oblique (RPO). This research was conducted at RSU Haji Adam Malik Medan in April – July 2021. The type of research used was descriptive qualitative research. Descriptive research is a search for facts with appropriate interpretation. The results of diagnostic examinations provide information about abnormalities in the urinary tract using Digital Radiography (DR) as film processing and Uretrocystography with suspected urethral stricture using a General x-ray unit with a capacity of 300 mA.

**Keywords:** Urethral stricture, Anteroposterior (AP) and Right Posterior Oblique (RPO) projections, Computed Radiograph

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## **1. INTRODUCTION**

The urinary bladder or bladder is an organ that collects urine which is located postero-superior to the symphysis pubis. The anterior part borders the rectum and the lateral part borders the pelvic bones. The shape and size vary according to the amount of urine collected. The capacity is around 500cc. The wall of the urinary bladder is formed by the peritonium (outer layer), tunica muscularis (muscle layer), tunica submucosa, and mucosal layer (inner layer) [1].

The urethra is a narrow channel formed from a muscular membrane and is the most distal organ of the urinary tract which functions to channel urine from the urinary bladder out of the body and in men is the ejaculation channel. The urethra in men is approximately 15 cm long and is formed from a mucosa layer (innermost layer) and a submucosa layer. The urethra in men consists of the pars prostatica urethra, which is located proximally, approaching the urinary bladder and parallel to the prostate [2]. Approximately 2.5 cm long, the pars membranous urethra is located between the prostatic urethra and the pars cavernosa urethra, the pars cavernosa urethra is distal to the bulbos and is the longest part of the urethra and is the final place where urine comes out of the body in the urethra. The urethra in women is approximately 3-5 cm long and is formed from the tunica muscularis (outer side), the mucosal layer (inner layer). The urethra in women is located behind the symphysis pubis running at a slight upward angle. while the opening of the urethra in women is located above the vagina (between the clitoris and vagina) and the urethra here is only an excretory channel [3]. (Stricture is a narrowing of the urethra caused by scar tissue (fibrosis) which leads to obstruction and dysfunction of the urinary tract. potentially serious consequences for the urinary tract. Urethral stricture is a narrowing that occurs in the urethra which can obstruct the urinary tract. Therefore, a radiographic examination needs to be carried out to show whether there is a stricture and its effect on the surrounding urinary tract organs [4]. The radiographic technique used is AP (Antero Posterior) and RPO (Right posterior Obliq) projections with the assistance of water soluble (+) media contrast fluid and the plane used is a general x-ray fluoroscopy plane with a capacity of 300Ma and image recording uses Digital Radiography (DR) to improve work efficiency and x-ray photo quality [5].

Fluoroscopy is an x-ray examination method to produce video-like images [6]. This method is used to directly observe the condition of the body organs being examined, in this case a urethrocytography examination with suspected strictures so that you can observe the image of the organs being examined directly and you can immediately

see the abnormalities suffered by the patient during the urethrocytography examination, namely urethral strictures [7].

So the preparation of this scientific paper formulates the problem as follows "What efforts can be made to obtain a radiographic image of Urethrocytography with an optimal suspicion of urethral stricture?" Based on this, the author will study further the examination technique of radiographic urethrocytography with suspected urethral stricture in the form of a scientific paper with the title: "Radiographic urethrocytography suspected urethral stricture at the Haji Adam Malik General Hospital, Medan" [8].

By paying attention to the background of the problems mentioned above, in carrying out radiographic urethrocytography with a stricture condition, as well as to obtain an optimal radiographic image, there are many influencing factors, among others, there needs to be cooperation between the radiographer and the patient for a smooth examination where the projections carried out in radiographic urethrocytography with The suspicion of Urethral Stricture is that the author only uses Antero-Posterior and Right Posterior Oblique Projections on [9].

Urethrocytography radiography, due to the Antero-posterior (AP) and Right Posterior Oblique (RPO) projections, is able to show abnormalities in urethrocytography using contrast media. The ideal type of X-ray aircraft used in urethrocytography radiography with suspected stricture is a general x-ray unit with fluoroscopy. The examination technique used is Antero-Posterior (AP) and Right Posterior Oblique (RPO) projections aimed at showing strictures in the urethra. Image recording is carried out using Digital Radiography (DR) to improve work efficiency and the quality of X-ray photos [10].

## **2. METHODS**

### **Types of Inspection**

The type of examination that the author uses in preparing this scientific paper is a qualitative descriptive examination. Qualitative examination is an approach that is also called investigation because examinations usually collect data by meeting face to face and interacting with people at the examination site. This means that the data collected is not in the form of numbers, but rather data obtained based on field notes and notes from other official documents [11]. The use of this qualitative examination method is to match the applicable theory with the reality that occurs in the field. The examination that the author received was about radiographic urethrocytography with suspected urethral stricture at the Haji Adam Malik General Hospital, Medan [12].

### **Time and Place of Inspection**

On March 15, the patient came from outpatient care to the radiology room with a letter of introduction from the doctor to undergo a radiographic examination of urethrocytography . Radiology Installation at Haji Adam Malik General Hospital, Medan

### **Data Collection Techniques**

To obtain correct and accurate data in preparing this scientific paper, the author used several methods as follows: Observation, Observation is a method of collecting data by observing or reviewing carefully directly at the research location to find out the conditions that occur or prove the truth of a research that is being carried out. The author obtains data by directly observed and participated in the implementation of Urethrocytography Radiography with suspected Stricture at the Haji Adam Malik General Hospital, Medan [13]. Interview, Interviews are questions and answers from researchers, sources or people being interviewed. By conducting interviews with the patient's family or with the patient and a radiology specialist [14]. Documentation, Documentation is a form of activity or process in providing various documents by utilizing accurate evidence based on records from various sources. By studying the results of urethrocytography radiographs found during normal clinical practice or abnormalities, especially urethral strictures [15].

### **Examination Instruments**

In this examination, the examination instruments used were: Worksheets which were used to record important study results regularly, the results of observations at the Haji Adam Malik General Hospital, Medan, where the author obtained examination samples.

### **Data Analysis**

Data collected from the results of analysis carried out qualitatively and descriptively become the results of the examination so that a conclusion is obtained.

## **3. RESULTS AND DISCUSSION**

### **Results**

As a result of the evaluation, the author reports the results of Radiographic Urethrocytography with suspected Stricture at the Haji Adam Malik General Hospital, Medan, with patient data as follows [16]:

## Patient Identification

### A. Patient Identity

Name : Mr MA  
Birthdate: 06-14-2004  
Gender : Man  
No. Rm : 778242  
Checking type: Urethrocytography radiography  
diagnosis: Urethral stricture

## Examination Procedure

Based on request letter for a radiographic examination using Urethrocytography with suspected stricture on the patient by the sending doctor, then an examination will be carried out with Anterior Posterior and Right Posterior Oblique projections. The patient came with a letter of introduction to the examination to be carried out from the doctor who sent a letter requesting a photo of urethrocytography using contrast media [17].

- After completing registration with the administration, the patient brings the photo request letter to the Radiology room
- Then the Radiographer receives a letter requesting photos.
- Then the Radiographer explains to the patient or the patient's family about the examination that will be carried out on the patient.
- After that, the radiographer provides a letter or informed consent that the patient or family agrees to the examination that will be carried out on the patient
- Then the Radiographer prepares the materials needed for this examination, an X-ray plane equipped with fluoroscopy, contrast media, 50cc syringe, catheter, sterile bend, patient clothes, clamps.

## Patient Preparation

When carrying out Urethrocytography radiography with suspected stricture, the patient does not require special preparation, but before the examination the patient is asked to urinate first. Make sure that objects around the object that could interfere with the image are removed first [18]

## Preparation Of Examination Equipment

- X-ray and Fluoroscope



**Figure 1. General x-ray and fluoroscopy aircraft, Haji Adam Malik General Hospital, Medan.**

The X-ray aircraft data used in Urethrocytography with suspicion of stricture , namely : inspection

AircraftType : EN 60825-1:2014  
BrandAircraft : Siemens  
Aircraft Services : Radiography and Fluoroscopy

kVmaximum : 150kV  
minimum kV : 40 kV

### Examination Techniques

The projections described here are in accordance with the examination that the author carried out on the patient, namely the Anterior-Posterior and Right Posterior Oblique projections [19].

#### Preliminary Photo / Antero Posterior (AP) Projection

Purpose of inspection : To see the patient's preparation and determine further exposure factors .

Patient position : The patient is supine / sleeping on his back on the examination table.

Object position : Set the MSP of the body in the middle of the examination table. Adjust the patient's shoulders and hips in line with the cassette. Both hands are placed next to the head and do not create shadows on the film. Separate the legs, internally rotate the soles of the feet and all lower limbs 15-20 0 [20]. Place a sandbag on the patient's feet so that there is no movement from the original position. Center the tape 2 inches (5 cm) above the pubic symphysis [21].



**Figure 2. Supine position / sleeping on your back**

Central Ray : Vertical perpendicular to the cassette

Central Points : Middle of the pubic symphysis

Focus Film Distance (FFD) : 100 cm

Exposure Factor : 75 kV, 30 mAs, 200 mA, exposure at exhalation while holding the breath.

Image Criteria : Pelvic view, lumbar 5, os sacrum, os coccyges. rochanter is clear and present the same size. The proximal femur is visible. The obturator foramen is symmetrical. The lesser trochanter is visible.



**Figure 3. Pelvic Radiography Anterior Posterior Projection.**

Contrast media is done retrograde (in the opposite direction to the flow of the urinary system ) and antegrade (in the same direction as the flow of the urinary system). The contrast ratio is 1:4 for the urinary bladder while for the urethra directly using pure contrast. The tip of the catheter is connected to a syringe containing contrast media. The contrast material is injected slowly until it fills the urinary bladder and urethra . The patient is previously instructed to give a signal when his bladder feels full (there is a desire for a mixie ). The patient is instructed to hold the feeling of wanting a mixie for a moment and the catheter is clamped and then exposed [22].

### **RPO Projection Urethrography**

Patient Position : The patient lies supine on the examination table.

Object Position : MSP of the body in the middle of the examination table. Body

The patient is rotated to the right 35 - 45 0 , as appropriate with the preference of the examining doctor. The left thigh is abducted and extended to prevent superposition on the vesical area urinary. Elbows and shoulders are bent so that the patient can put your hands behind your head. Knee The patient's bottom is only flexed slightly to keep the soft tissue on the medial side of the thigh as close to the center of the cassette as possible. The patient is positioned in the middle of the examination table so that the cassette can be centered on the superior border of the pubic symphysis. This centering coincides with the root of the penis [23].



**Figure 4. Right posterior oblique / RPO position**

Central Ray : Vertical perpendicular to the cassette

Central Point : Mid Pubic symphysis

Focus Film Distance (FFD) : 100 cm

Exposure Factor : 78 kV, 30 mAs, 200 mA, Exposure at time exhalation and while holding the breath.

Notes : The patient takes off all clothes because The examination will focus on the umbilicu to the genital organs and the patient only in cover with a cloth or sarong to make it easier inspection and makes injection easier contrast medium through the existing catheter attached to the patient's urethra .

### **Urethrocytography Right Posterior Oblique (RPO) Projection**

Patient Position : The patient lies supine on the examination table.

Object Position : Set the body MSP in the center of the examination table.

The patient's body is rotated to the right 35 - 45 0 , according to the examining doctor's preference (Figure 4.3). The left thigh is abducted and extended to prevent superposition on the urinary bladder area. Elbows and shoulders are bent so that the patient can place his hands behind his head. The patient's lower knee is only bent slightly to keep the soft tissue on the medial side of the thigh as close to the center of the cassette as possible. The patient is positioned in the middle of the examination table so that the cassette can be centered on the superior border of the pubic symphysis [24]. This centering coincides with the root of the penis . Evaluation of results After completing the Urethrocytography radiographic examination with suspected stricture, the author then evaluated the results of the radiographic image:

The projections used are the Antero-Posterior projection and the Right posterior oblique projection.

Sharpness : adequate

Details : enough

Density : sufficient

In the Antero Posterior projection, the upper border between the two scias and the lower border of the symphysis pubis and in the Right posterior oblique projection shows the flow of contrast entering the urinary bladder and the proximal urethra [25].



**Figure 5. Radiographic stricture image**

Evaluation of the image in the Antero-Posterior projection as follows:

1. Anatomical images of the pelvis, lumbar 5 os sacrum, greater trochanter are visible
2. clearly visible and the same size [26]. The proximal femur is visible [27].
3. The upper border of the umbilicus and the lower border of the symphysis pubis are visible
4. It was seen that the patient's urinary bladder was empty because before the examination, post-micturition was carried out [28].

Evaluate the image in the Right Posterior Oblique projection as follows:

1. The urinary bladder and urethra are visible.
2. The image of the proximal urethra is filled with contrast and leads to the urinary bladder
3. The image of the urinary bladder is not superposed with the thigh.
4. The urethra appears parallel to the femur and does not overlap [29].

#### 4. CONCLUSION

From the results of the research described in this paper entitled "Radiography Urethrocytography with suspected Stricture " at the Haji Adam Malik General Hospital, Medan, the author can draw the following conclusions: In the Uretrocystography examination with suspected urethral stricture , the projections used are the Anteroposterior (AP) and Right Posterior Oblique (RPO) projections.

- a. When examining a urethrocytography with suspected urethral stricture, you need to pay attention to the method of delivery information to the patient so that there is good cooperation between the radiographer and the patient for the smooth running of the examination.
- b. In terms of radiation protection, protection against radiation is very important so that the dose received by the radiographer and patient is as minimal as possible.
- c. In the Uretrocystography examination with suspected urethral stricture , the plane used is a conventional plane with Fluoroscopy.

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