Global Journal of human-social science: I
Surgeries and Cardiovascular System
Volume 14 Issue 2 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

# Role of Ureteroscoy and Retrograde Studies of the Ureter in Diagnosis and Treatment of Ureteric Pathology

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*Materials and Methods:* This is a prospective cross sectional hospital based study conducted in Khartoum Sudan, in IbnSina hospital, Omdurman Military base hospital ISH, OMBH and SUH in the period between Oct 2012-Sep 2012. It included all patients who underwent Ureteroscopy and retrograde studies

*Results:* Most patients were males in the ages between 31-40 yrs old, Loin pain was the most common presenting symptom in 116(91.3%).

*Keywords: ureteroscopy, retrograde studies lithotriptor, dj stent.*

*GJMR-I Classification: FOR Code: WN 180*

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# Role of Ureteroscoy and Retrograde Studies of the Ureter in Diagnosis and Treatment of Ureteric Pathology

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*Results:* Most patients were males in the ages between 31-40 yrs old, Loin pain was the most common presenting symptom in 116(91.3%). The diagnosis was made initially using imaging using U/S, IVU, CT KUB The main indication for ureteroscopy in this study was Ureteric stone (78.7%), These imaging findings when compared to ureteroscopy results showed a discrepancy in diagnosis. Disintegration of stones done in 60 pts (74.2%) and stone extraction was performed in 26 pts (33% ) Post ureteroscopy DJ stenting was performed for all patients who underwent ureteroscopy , (20%) of patients had post-operative complications.

*Conclusion:* In this study it is our opinion that Ureteroscopy and retrograde studies is an effective and safe interventional and diagnostic modality for different ureteal pathology.

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## I. Introduction

For centuries, endourology has been on the forefront of minimally invasive procedures, with Philipp Bozzini (1773-1809), a young German army surgeon who developed a sharkskin-covered instrument housing a candle within a metal chimney and a mirror on the inside that reflected light from the candle. Bozzini used this instrument to look into the urethra, among other orifices. (1) This was the early 18th century ancestor of what would be the modern cystoscope. Since that time, endourology has rapidly expanded its role in the treatment of urological disease to the point of limiting the use of certain open procedures, such as anatrophic nephrolithotomy, to only the extremely difficult cases. Ureteroscopy (URS) is defined as retrograde instrumentation performed with an endoscope passed through the lower urinary tract directly into the ureter and calyceal system (2). Although it was first described in 1912(3), it was not routinely performed until the late 1970s. However, ureteroscopy has gradually become a major technique for the diagnosis and treatment of lesions of both the ureter and intrarenal collecting system(4).The major therapeutic indications of ureteroscopy include urolithiasis, Ureteric strictures, pelviuretericjunction (PUJ) obstruction, and ablation of transitional cell carcinoma and retrieval of migrated stones(5). There are several types of lithotripter energy sources. These include electrohydraulic, mechanical, electromechanical, ultrasonic and laser energy sources. The miniaturization of ureteroscopes and introduction of the holmium (Ho: YAG) laser has improved stone free rates (6). Several authors showed ureteral strictures can be treated by dilatation or endoscopic incision through a retrograde, antegrade or combined approach using rigid and/or flexible ureteroscopes. Ureterscopy and retrograde study can also be used as a diagnostic procedure. It can be used in the evaluation of ureteric transitional call carcinoma, filling defects and undiagnosed haematuria. Beginning the 1980s endourological approaches have been used to treat localized transitional cell carcinoma of the upper urinary tract in patients with contraindication to nephroureterectomy(7) .

Ureteronoscopy performed to evaluate an upper urinary tract (UUT) filling defect greatly enhance diagnostic accuracy. In addition to visualizing UUT, it offers opportunity to biopsy any lesion encountered, allowing histopathological confirmation(8).With widespread practice however, have come various incidents or complications and new solutions for prevention(4). Complications of Ureteroscopy can range from minor complications such as colic, fever, haematuria to major complications like ureteric perforation and avulsion (9).

According to several reports with growing experience and better equipment, however, the safety of the procedure has increased (4). Supporters of URS as

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the primary treatment for distal calculi claim that it is highly successful and minimally invasive in trained hands and has minimal morbidity(9). Advances in instrument design, flexibility and reduced size have also reduced the rate of complications.

## II. Objectives

*General Objective:* 1-To evaluate the effectiveness of URS and retrograde studies in diagnosis different ureteric pathology.2-To evaluate the role of URS in the treatment of different ureteric pathology.

*Specific Objectives:* 1. To evaluate the most common ureteric pathology as detected by URS and retrograde studies. 2. To compare the accuracy of diagnosis ureteric pathology by URS and retrograde studies with other methods (U/S, I. V. U, CTUandCT- KUB).3. To evaluate different procedures used in treatment of different ureteric pathology.4. To evaluate complications which are associated with URS.

## III. Material and Methods

This is a a descriptive prospective cross-sectional hospital based study conducted in IbnSina hospital and Omdurman Military base hospital in the period between Oct 2013-sep 2014. All patients who underwent ureteroscopy and retrograde studies in IbnSina hospital and Omdurman Military base hospital were enrolled in this study.

*Inclusion Criteria:* All patients underwent URS and retrograde studies.

*Exclusion Criteria:* All patients underwent URS and retrograde studies who refusing to participate in this study.

*Data analysis:* The questionnaire was design in a way that facilitates for computer based analysis of data. The data was entered into the computer and analyzed using the SPSS program.

## IV. Result

In this study the majority of patients were males (70.1%) females represented (29.9%). When comparing these results to other regional studies the percentage of males in this study is much higher for e.g. an Ethiopian study showed males representing 56% and females were 44% (10), another study from Oman reported males representing 58.6% and females 43%(11). Males and females in Sudan have major differences in occupation the majority of males are farmers and unskilled labors with the weather and work environment predisposing them to dehydration, UTI and stone formation.

The commonest age group in the presenting patients was between 31-40 yrs (21.3%), followed by 21-30 yrs (19.7%)(figure 1). These results correlate with the study from Oman where the commonest age group was 30-41 yrs (11) This observation can be explained by the fact that the main indication for ureteroscopy in this study was ureteric stone in (48.7%).

The most common presenting symptom was loin pain (91.3%), This is not surprising as the major pathologies in the ureter in this study are obstructive conditions that lead to intermittent ureteric contractions more colic and haematuria. In this study 20% of the patients presented with fever indicating the prevalence of infection among presenting patients which later reflects on their postoperative complications.

In these study the imaging findings when compared to ureteroscopy results showed a discrepancy in diagnosis (figure 2) Literature show diagnostic radiological studies by CT KUB as 100% accurate (12). But this was not the case in this study; and other regional studies for e.g the Ethiopian study (10) showed a great discrepancy between radiological and ureteroscopic diagnosis in (23.9%)of patients who had an indication for ureteroscopy had a normal URS, (64.3% )were radiologically found to have ureteric stones but URS found stones in only( 45.3%), These finding show that ureteroscopy is an important diagnostic procedure independent of imaging. In this study the most common therapeutic procedure done was disintegration of stones in 60 pts (74.2%), Stone extraction was performed in 26 pts (33%0, of these (60%) were performed in the age group 1-10yrs. These results may be due to anatomical differences between children and adults which facilitates stone extraction in children. Patients with strictures were managed by meatotomy and DJ stenting in 3 pts 24%, dilatation and DJ stenting in 4 pts 3.2%, the remaining patients were treated by stenting only. These results are comparable to a study from Oman which concluded that the role of balloon dilatation of PUJ is an accepted procedure which they performed in 3 cases (11) and all have done well symptomatically, endopyelomyotomy was done successfully in 2 pts. A study by Saint John Emergency clinical hospital(13) in which 230 pts were treated using cold knife incision and nd: YAGlaser; concluded that compared to the antegrade approach the retrograde approach has the advantage of being less invasive, avoiding possible renal complications.

Post ureteroscopy DJ stenting was performed for all patients who underwent ureteroscopy in this study, there is controversy regarding guidelines on the placement of stents following ureteroscopic procedures, some centres routinely employ stents since it reduces post operative pain which may arise due to ureteric meatal oedema as a result of ureteric meatal dilatation and reduces hospital stay and in another studyDJ catheters were fixed in 42 % of patients undergoing urethroscopy 14). However routine stenting is not necessary in all cases of ureteroscopy as the stent by itself can cause problems like dysuria, UTI, haematuria and migration which occured in five patients in this sudy.



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The overall complication rate was 20%, postoperative haematuria was found in 4%, which is less compared to the Ethiopian study which was showed 8.3% (10). ureteal perforation (0.8%) which matched the Reported percentage of it was 1 (2.6%) patient in Hofbauer's series and in Peter's study, 1 (0.6%) acquired this complication Sepsis(15) is was the commonest complication in this study 9.8% it occurred mainly in the elderly age group, this percentage is very high compared to other studies which reported fever as a mild self-limiting post-operative complication(16), this high rates of sepsis can be explained by the high rates of patients presenting with fever 20.5%. All patients received preoperative prophylaxis in form of one dose of injectable antibiotic, those with preoperative fever should have been treated therapeutically with a full dose antibiotics which would have been a major factor in reducing the over all postoperative complications

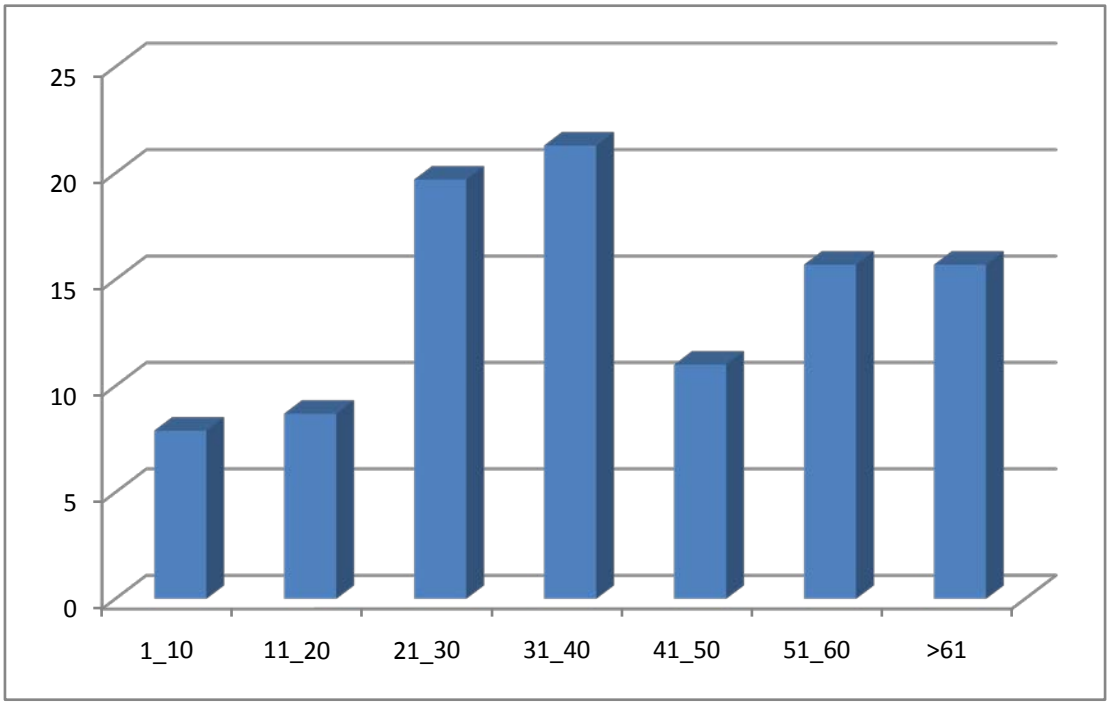


*Figure 1 :* The Age Distribution of in127 Patients

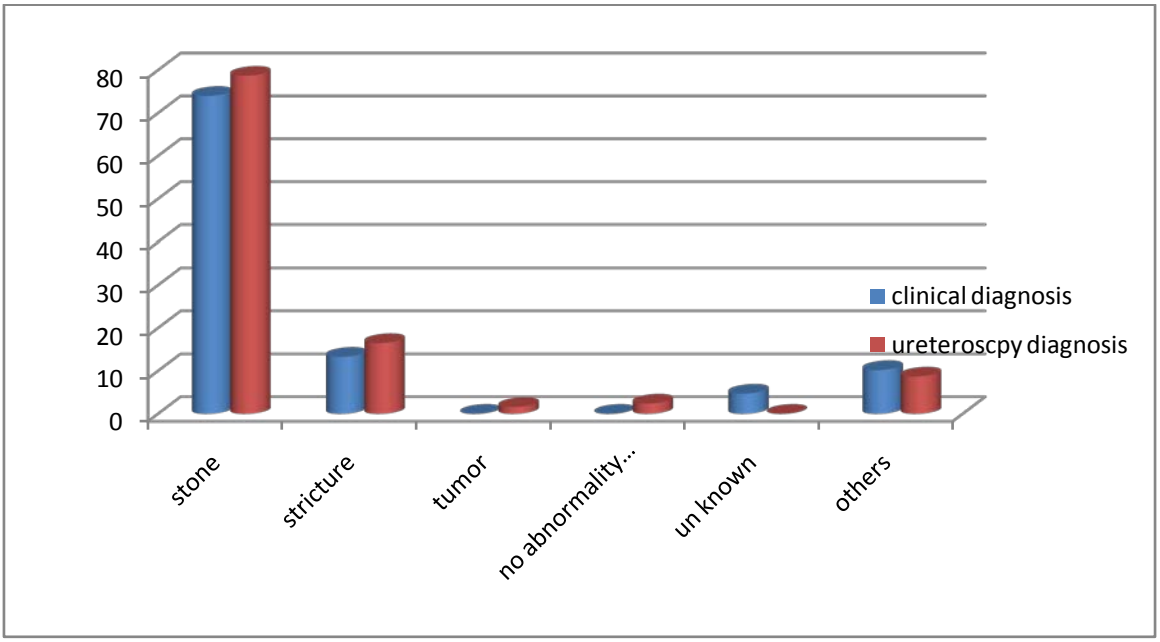


*Figure 2 :* Radiologically and Ureteroscopic Diagnosis of 127 Patients



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## V. Conclusion

In this study it is our opinion that Ureteroscopy andretrograde study is an effective and safe interventional and diagnostic modality for different ureteal pathology Uretaric stone is the most common pathology which diagnosed and treated successfully either by extraction or disintegration.DJ STENT was used after all URS done which proven to have its own complication.

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