

# Use of rigid retrograde ureteroscopy in patients with ureteral lithiasis

## Abstract

**Objective:** To characterize patients diagnosed with ureteral lithiasis operated by ureteroscopy at the “Dr. Antonio Luaces Iraola” from Ciego de Ávila from December 2017 to November 2022. A retrospective longitudinal descriptive observational study was carried out. The universe consisted of 56 patients and 54 were studied by intentional non-probabilistic sampling. Results: Most of the patients were between 40 and 60 years old, white-skinned, male, normal weight, and residents of Ciego de Ávila. More than half of the stones measured between ten and fifteen millimeters, and the lower ureteral third was the most frequent location, urinary tract infection was the most frequent complication, as well as a hospital stay of three to seven days. Conclusions: It was found that lithiasis was more frequent in male patients, with white skin, between the fourth and sixth decade of life. The stones were located mainly in the lower third of the ureter. After ureteroscopy, almost all subjects were stone-free, complications were rare, and hospitalization was generally less than seven days.

**Keywords:** ureterolithiasis, epidemiology, ureterolithiasis therapy, ureterolithiasis surgery, ureteroscopy

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**Abbreviations:** ESWL, extracorporeal shock wave lithotripsy; F-URS, flexible ureteroscopy; PNL, percutaneous nephrolithotomy

## Introduction

Urinary lithiasis is a disease characterized by the appearance of stones in the urinary system. It constitutes the third most frequent urological disease, after infections and prostate pathology.<sup>1</sup>

Calculi located in the ureter are formed in the kidney and frequently do not exceed 5 mm. When they acutely occlude the passage of urine, they produce nephritic colic.<sup>2</sup> At present, it continues to be more prevalent in men than in women (ratio 1.6/1), although the risk is equalizing, possibly due to changes in lifestyle and the increase in the percentage of the obese population.<sup>3</sup>

The recurrence rate is between 26 and 53% at 10 years and between 60 and 80% throughout life and is related to the presence of family history and risk factors.<sup>4</sup> The possibility of the expulsion of lithiasis decreases with the increase in its size, most of the stones smaller than 5 mm pass spontaneously through the urinary tract.<sup>5</sup>

From the accelerated and continuous technological development and its application to the different branches of medicine ESWL and endourological procedures and more recently laparoscopic surgery have been developed for the solution of this entity.<sup>6</sup>

In Cuba the prevalence of urinary lithiasis is considered not less than 8% in the adult population. Its location in the ureter is related to complications such as infection and impaired renal function, hence the need for effective and safe treatment.<sup>7</sup> In Ciego de Ávila, no official data on the incidence or prevalence of this disease has been published.

The study is current and pertinent, as it responds to one of the indicators of the 2030 Agenda and the United Nations Sustainable Development Goals, in its section of providing quality medical services that offer patients the safest and most with fewer risks.<sup>8</sup> and has as objective to characterize patients diagnosed with ureteral lithiasis who underwent ureteroscopy at the Provincial General

Teaching Hospital “Dr. Antonio Luaces Iraola” from Ciego de Ávila from December 2017 to November 2022.

## Methods

A retrospective longitudinal descriptive observational study was carried out to characterize patients diagnosed with ureteral lithiasis who underwent ureteroscopy at the Provincial General Teaching Hospital “Dr. Antonio Luaces Iraola” from Ciego de Ávila, from December 2017 to November 2022.

The universe of study was made up of 54 patients with upper urinary tract lithiasis, who were treated using the ureteroscopy technique at the reference center in the study period framed above. An intentional non-probabilistic sampling was carried out.

## Surgical technique

The patient was placed in the lithotomy position, with the leg lateral to the stone in extension, the ipsilateral leg in forced flexion, the perineum at the table's edge. A bladder catheter was placed in the same way. A guidewire was passed to facilitate entry and progression into the ureter.

Once the ureter had been accessed, the irrigation flow pressure was decreased so that the stone did not ascend. It was considered having a good quality of vision that allowed seeing the ureteral lumen.

The stone was extracted with forceps and/or a Dormia basket, and if necessary, lithofragmentation was performed. Once the fragments were extracted, the ureteral catheter was maintained if there were signs of edema, ureteral lesions, lithiasis remains, significant manipulation, or some type of complication.

## Statistical techniques and procedures

Once the information of the selected patients was collected, a file was prepared using the Microsoft Excel program for data collection and its subsequent processing with the SPSS® version 26.0 program. Descriptive statistical methods and summary measures were used for qualitative and quantitative data.

## Ethical aspects

The basic principles of bioethics were respected: autonomy, justice, beneficence, and non-maleficence.<sup>9,10</sup> It was agreed not to disclose the information collected individually, only the global results were disclosed.

## Results and discussion

Table 1 shows that the largest number of patients were between the ages of 40 and 60, more than 60%, while only 5.6% were younger than 30, and less than 15% were aged 60 or older.

**Table 1** Distribution of patients according to age Teaching General Provincial Hospital Dr Antonio Luaces Iraola Ciego de Avila. December/2017- November/2022

Age	Patients No.=54	%
20-29	3	5.6
30-39	10	18.5
40-49	15	27.8
50-59	18	33.3
≥60	8	14.8
Total	54	100

**Fountain:** Data collection form.

In the study carried out by Mancero Sánchez and Ruiz Illapa,<sup>11</sup> most of the patients were between the ages of 35 and 54 (more than 55%), data that coincides with the predominant age groups in the present investigation.

On the other hand, Portales Calderín et al.<sup>12</sup> found in their work with 53 patients that almost 60% were in the age group of 41 to 60 years, agreed with the study in question, showing very similar percentages in all of them. the age ranges, 21-30 years (7.5%), 31-40 years (15.1%) and over 60 years (18.9%).

Table 2 shows that 62.9% of the patients studied were male, and the vast majority were white skinned (85.2%).

**Table 2** Distribution of patients according to sex and skin color

Sex	Patients No.=54	%
Female	20	37
Male	34	62.9
<b>Skin color</b>		
White	46	85.2
Not white	8	14.8

**Fountain:** Data collection form.

Mancero Sánchez and Ruiz Illapa,<sup>11</sup> studied 109 patients with endoscopic surgical treatment, finding a predominance of the male sex (68.81%), which is consistent with the results of the present study.

However, Osorio- Manrique et al.<sup>13</sup> obtained a predominance of the female sex in their series of patients, which is not assimilated to the statistics shown in the present study.

Skin color was a parameter little addressed in the studies consulted, without explicit statistical reference results being found in any of the cases.

Table 3 shows that calculi from 10 to 15mm (62.9%) predominated. It should be noted that all patients with lithiasis smaller than 10 millimeters had sizes greater than 5 millimeters. In relation to location, the stones located in the lower third were the majority (51.9%), two patients presented lithiasis in the upper third of one ureter and half of the other.

**Table 3** Distribution of patients according to characteristics of the lithiasis

Stone size	Patients No.=54	%
<10mm	20	37
10–15mm	34	62.9
<b>Location</b>		
Upper third ureter	16	29.6
Middle ureteral third	12	22.2
Lower third ureter	28	51.9

**Fountain:** Data collection form.

Regarding the size of the stones, Mancero Sánchez and Ruiz Illapa<sup>11</sup> found sizes between 5 and 10 millimeters (78.90%) in most of their patients, which disagrees with the values found in the current study.

In the aforementioned work,<sup>11</sup> lithiasis of the lower third of the ureter was the most frequent (34.86%), this result being consistent with that found in the present series where this location represented more than 50% of the cases.

For their part, Portales Calderín et al.<sup>12</sup> worked with a series in which most of the intervened patients had stones with diameters between 10 and 20 mm.

As shown in Table 4, 92.6% of the patients were free of stones after surgery. Only five subjects presented any complication related to the intervention, urinary tract infection being the most frequent (5.6%). Most of the patients treated by ureteroscopy remained hospitalized for three to seven days (55.5%). The patients with a stay of more than seven days coincided with the three patients with urinary tract infections.

**Table 4** Distribution of patients according to evolutionary variables

Calculus free after surgery	Patients No. =54	%
Yeah	50	92.6
No	4	7.4
<b>Complications</b>		
Urinary tract infection	3	5.6
Calculus retropulsion	1	1.9
Ureteral stricture	1	1.9
<b>Hospital stay</b>		
Less than 3 days	21	38.9
From 3 to 7 days	30	55.5
Older than 7 days	3	5.6

**Fountain:** Data collection form.

Fernández Alcalde et al.<sup>14</sup> carried out a systematic review in which they studied five works that compared F-URS with PNL. The stone-free rate of F-URS ranged from 47.0% to 95.0%, and that of PCNL ranged from 87.0% to 100%.

In this same study,<sup>14</sup> complications ranged from 8.8% to 29% of the cases that underwent ureteroscopy, being those of an infectious nature the most frequent in these patients, data that were relatively high in comparison with those found in the present study, although the coincidence with respect to the most frequent complications should be highlighted.

In a retrospective investigation carried out by Baboudjian et al.,<sup>15</sup> in which 604 patients who underwent ureteroscopy were studied, it was found that 41 subjects presented urinary infection as a complication, this being significantly higher in women ( $p < 0.001$ ). Similar results were obtained by Díaz Pérez et al.<sup>16</sup> who found a predominance of

females with post-surgical urinary tract infection in their series ( $p < 0.001$ ).

In the work carried out by Portales Calderín and collaborators.<sup>12</sup> The complications presented were related to the location and size of the lithiasis, the technique used, the history of urinary infection and the placement of a catheter prior to fragmentation.

In four of the works studied by Fernández Alcalde,<sup>14</sup> the mean hospital stay was less than three days, a value that is not far removed from that found in the work in question, where the subjects with a stay of less than three days were 38.9%.

It should be noted that, in the present study, antibiotic therapy was applied to all patients prior to the intervention and for at least seven days after the procedure.

## Conclusion

Patients aged between 40 and 59 years predominated, as well as white-skinned and male individuals, The lower third of the ureter was the most frequent location and most of the subjects had stones of 10 to 15 mm. Almost all the patients were free of stones after the intervention. The subjects who presented complications were a minority, and of these, urinary tract infections turned out to be the most frequent. Hospital stays of less than seven days predominated, while many patients were hospitalized for less than three days.

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## Conflicts of interest

Authors declare that there is no conflicts of interest to this manuscript.

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