

# Endoscopic Internal Urethrotomy (EIU): Results of a Dynamic Study at the Urology-Andrology Department of the University Hospital Center (UHC) of Conakry

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**How to cite this paper:** Barry, M.II, Cissé, D., Diakité, M.G., Gnammi, L.R., Diallo, T.M.O., Bah, M.D., Bah, M.B., Diallo, A., Kanté, D., Bah, I., Diallo, A.B. and Bah, O.R. (2021) Endoscopic Internal Urethrotomy (EIU): Results of a Dynamic Study at the Urology-Andrology Department of the University Hospital Center (UHC) of Conakry. *Open Journal of Urology*, 11, 427-435.

<https://doi.org/10.4236/oju.2021.1111042>

**Received:** August 23, 2021

**Accepted:** November 27, 2021

**Published:** November 30, 2021

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## Abstract

**Introduction:** Endoscopic internal urethrotomy (EIU) is a technique that consists of an incision of the stenosed urethra under visual control. Its indication is widespread since the first description in 1971 by Sachse. The objective was to analyze the results of EIU in the treatment of urethral stenosis (US) at the Andro-Urology Department of the UHC of Conakry. **Methodology:** It is a prospective descriptive study, lasting 18 months (January 2016-30 June 2017). It involved 102 patients. The variables were: age, etiology of US, type of catheter, duration of catheter wear and recurrences. After a 12-month follow-up, our results were considered good in the absence of recurrences. **Results:** The average age was 54.25 years with the extremes comprising between 16 and 96 years. The main reasons for medical checkup were chronic urine retention at 58.82%. Etiology infection was the most frequent with a ratio of 81.37%, while *Escherichia coli* was found at 51.29%. US was bulbar (71.57%), unique (67.64%) and less than 1 cm (60.78%). Surgical complication occurred with 9 patients (8.82%) with urethrorrhagia and the external genital organs infiltration in 4 cases. Results were good for 77 patients (75.49%). Stenosis post infection, long and multiple stenoses, urethral catheterization with latex catheter and urethral catheterization of more than 4 days were strongly associated with the recurrence occurrence. **Conclusion:** The EIU is a minimally invasive surgical technique that offers good results.

## Keywords

Urethral, Stenoses, Endoscopic, Urethrotomy, Conakry

## 1. Introduction

Endoscopic Urethrotomy (EIU) is an endoscopic surgical technique indicated in the treatment of urethral strictures (US) which consists of the midday incision of the entire thickness of the narrowed urethral wall using a cold blade, under-eye control. This technique was first described by Sachse in 1971 and reported an 80% success rate in 1974 [1]. US is the second cause of hospitalization in our department after prostate tumors and EIU is the first-line indication in its management.

The EIU was introduced into our service in 1987 with the team of Professor Jean DeLeval from the University of Liege in Belgium. The 1st study on the EIU carried out by Guirassy S *et al.* [2] between 1991 and 1997 reported a success rate of 51.80% after a one-year follow-up. Mortality was zero and morbidity was assessed at 9%. After two decades, our goal is to analyze the results and morbidity of this technique in the treatment of urethral strictures at the urology-andrology department of the University Hospital Center (UHC) of Conakry.

## 2. Patients and Method

This was a prospective study of the descriptive type, lasting 18 months from January 1, 2016 to June 30, 2017. It included 102 patients with urethral stricture who had undergone a EIU, then reviewed at 3, 6 and 12 months. The diagnosis of stenosis was suggested in any context of dysuria, associated with a history of sexually transmitted infections, trauma to the pelvis or urethra by bladder catheterization, and confirmed by retrograde urethrocytography with voiding images. The latter in addition to showing the narrowing, specified the number, location and extent.

EIU was performed on sterile urine through a full thickness incision of the stenosis at 12 o'clock using a cold blade (Wolf) with 0° optic Under visual control. The procedure was performed under locoregional anesthesia

After cystoscopy, upon removal of the urethrotome, an additional incision was sometimes necessary. A silicone or latex urethral catheter was left in place for 3 to 7 days.

The study variables were age, reason for consultation, etiology of US, results of cytobacteriological urine examen (CBUE), Retrograde urethrocytography and + Voiding cystography (RUC + VC), type of urethral catheter, length of time the urethral catheter was worn. postoperative and the occurrence of recurrences.

After a 12-month follow-up, our results were judged:

- ✓ Good: in the absence of recurrence;
- ✓ Bad: in the presence of a recurrence justifying another surgical procedure.

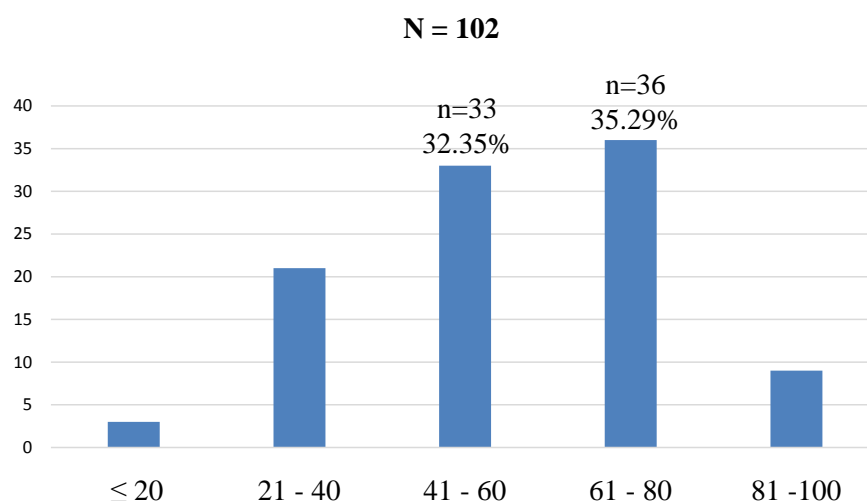
The data were collected from the files of patients operated for urethral stenosis, and from the registers of operative reports, on a pre-established survey sheet. Then, they were introduced and analyzed by Epi info in its version 7. We ensured the anonymity of the patients by encoding the data.

### 3. Results

Between January 2016 and June 2017, 162 cases of urethral strictures were hospitalized in our department, of which the EIU was the therapeutic indication in 62.96% (n = 102).

The average age was 54.25 years with extremes of 16 and 96 years. The 61 to 80 age groups were the most affected (**Figure 1**).

Patients consulted for chronic urine retention in 58.82% (n = 60), acute urine retention in 31.37% (n = 32), lower urinary tract symptoms (LUTS) in 6.86% (n = 7) and urethral stricture complicated by peri-urethritis in 2.94% (n = 3) (**Table 1**).



**Figure 1.** Distribution of patients by age (Average age: 54.25 years, range: 16 and 96 years).

**Table 1.** Distribution of patients according to clinical data.

clinical data	Effective	%
<b>Reason for consultation</b>		
Chronic retention of bladder urine	60	58.82
Acute retention of bladder urine	32	31.37
Lower urinary tract symptoms	7	6.86
urethral stricture complicated by periurethritis	3	2.94
<b>Etiologies of urethral strictures</b>		
infectious	83	81.37
iatrogenic	14	13.72
traumatic	5	4.90
<b>characteristics of urethral strictures</b>		
bulbar seat	73	71.57
single stenosis	69	67.64
stenosis length ≤ 1 cm	62	60.78

Etiologies of infectious origin were by far the most frequent with 81.37% of cases (n = 83) followed by iatrogenic in 13.72% (n = 14). Traumatic etiologies represented only 4.90% of cases (n = 5) (**Table 1**).

The strictures were complicated by urinal infection in 78 patients (76.47%). The most common germs were *Escherichia coli* in 51.29% (n = 40) followed by *Staphylococcus aureus* in 30.77% (n = 24). *Candida albicans* and *Enterobacter* were isolated in 7.70% (n = 6) and 5.12% (n = 4), respectively. *Streptococcus* and *Klebsiella* were each isolated in 2.56% (n = 2) (**Table 2**).

The US was of bulbar site in 71.57% (n = 73), unique in 67.64% (n = 69) and  $\leq 1$  cm of extent in 60.78% (n = 62) (**Table 1**).

The duration of postoperative drainage was  $\leq 4$  days in 82 patients (80.39%) and  $> 4$  days in 20 others (19.61%). The rate of per- and post-operative complications was 8.82% (n = 9) due to urethrorrhagia (n = 5 cases) and infiltration of the external genital organs in 4 cases (**Table 3**).

One month after the catheter was removed, the voiding stream was good in 97.06% (n = 99) and weak with dysuria in 2.94% (n = 3). After 12 months of follow-up, the results of the EIU were good in 75.49% (n = 77) and bad (recurrence) in 24.51% (n = 25) (**Table 3**).

The highest recurrence rate was found with post-infectious urethral strictures in 25.30% (n = 21). Eighty-four percent (84%) of recurrences were of infectious origin and 12% (n = 3) of iatrogenic origin.

The Latex catheter was the postoperative drainage material in 37 patients. It was associated with recurrence in 32.43% (n = 12). The silicone probe was used in 65 patients and the recurrence rate was 20% (n = 13).

The recurrence rate went from 24.68% (19/82) when the lead time was  $\leq 4$  days to 30% (6/20) when the lead was  $> 4$  days.

Depending on the extent, the recurrence rate increased from 30.64% (19/62) when the extent of US was  $\leq 1$  cm to 44.44% (4/9) when it was between 1.1 - 2 cm.

Based on the number of urethral strictures, the recurrence rate increased from 18.84% (13/69) when it was single to 30% (12/40) when it was multiple.

**Table 2.** Distribution of patients according to the germs responsible for urinary complications of strictures.

Germs isolated on cytobacteriological examination of urine	Effective	%
<i>Escherichia coli</i>	40	51.29
<i>Staphylococcus aureus</i>	24	30.77
<i>Candida albicans</i>	6	7.70
<i>Enterobacter</i>	4	5.12
<i>Streptococcus</i>	2	2.56
<i>Klebsiella</i>	2	2.56
<b>Total</b>	<b>78</b>	<b>100</b>

**Table 3.** Distribution of patients according to therapeutic and follow-up data.

Therapeutic and follow-up data	Effective	%
<b>nature of the probe (N = 102)</b>		
silicone probe	65	63.73
latex probe	37	36.27
<b>Drainage time (N = 102)</b>		
≤4 days	82	80.39
>4 days	20	19.61
<b>Per and post-operative complications (N = 9)</b>		
Urethrorrhagia	5	55.55
infiltration of the external genitalia	4	44.45
<b>Quality of urination one month after catheter removal (N = 102)</b>		
good voiding stream	99	97.06
Dysuria	3	2.94
<b>Treatment results after 12 months (N = 102)</b>		
Good results	77	75.49
Bad results (recurrence)	25	24.51

#### 4. Discussion

EIU was the first-line indication in our department with 62.96% of cases in the treatment of urethral strictures. It represented 74.28% in the study by Zango *et al.* [3] and 58% in that of Ngaroua *et al.* [4]. It was practiced up to 85.60% in the United States in 2006 [1]. The EIU can also be used as a second-line treatment for recurrent urethral stricture after urethroplasty. Sukumar *et al.* [5] in a multi-center study of 130 patients reported an indication of 41% (n = 53) of EIU after urethroplasty. The minimally invasive nature offering the possibility of performing the procedure on an outpatient basis or at the cost of a short hospital stay has made this technique very popular among urologists.

In our study, the most affected age group was 61 - 80 years (35.29%). The average age was 54.25 years with extremes of 16 and 96 years. The 60 - 80 years age group was the most affected in the series by Djé K *et al.* [6]. For Benjelloun *et al.* [7], the average age was 51 years with extremes of 16 and 90 years. She was 69 years old (range: 56 - 77) in a series of 360 patients for Hong [8]. Urethral stricture was more common in the second half of life. This period being that of the after-effects of active and ill-informed youth, but also and above all of the polygamy, particularly in our country.

Among the reasons for consultation in our study, chronic retention of bladder urine took first place with 60 cases (58.82%) followed by acute retention of bladder urine: 32 cases (31.37%). Zango B *et al.* [3] reported 48.57% urinary bladder retention. Dysuria was the main reason for consultation in the series by

Benjelloun [7] and Niang [9] with 82% and 83.6% of cases respectively. Likewise, Hong *et al.* [8] reported 53% of lower urinary tract symptoms with dysuria as the main symptom and 13% of urine retention. This difference could be explained by the late consultation deadline in our regions.

While iatrogenic urethral stenosis is the most common in developed countries [10] [11], in developing countries the infectious etiology remains the main provider of urethral strictures. In our study, urethral strictures were infectious in 81.37% of cases (n = 83). Ndour *et al.* [12] and Zango *et al.* [3] reported 71.04% and 68.6%, respectively, of urethral strictures of infectious etiology. These results could be explained by the multiplicity of partners set up as a way of life, the use of self-medication or traditional therapy at the origin of an apparent cure of urethritis.

Urethral stricture was complicated by urinary tract infection in 78 patients (76.47%). The germs responsible for this infection were dominated by *Escherichia coli* in 51.29% (40 cases) and *Staphylococcus aureus* in 30.77% (24 cases). Benjelloun *et al.* [7] had reported a urinary tract infection in 21 patients (8.61%) and among them, *Escherichia coli* was found in 89.8%. Niang *et al.* [9] found a urinary tract infection with *Escherichia coli* in 25.2% of cases. Stephenson *et al.* [13] reported 10% urinary tract infection.

Bulbar US,  $\leq 1$  cm in extent, were the most represented with 71.57% (n = 73) and 60.78% (n = 62) respectively in our study. Djé K *et al.* [6] reported 67.90% of bulbar urethral strictures with an extent of less than 3 cm in 89.29%. In the series by Benjelloun *et al.* [7], the urethral stenosis was bulbous in 73.8% and less than 2 cm in extent in 70.5%. These data are consistent with those in the literature which recognize that the bulbar urethra is the site of predilection for urethral stenosis.

Complications from EIU are rare and usually minor. The rate of intraoperative and postoperative complications in our series was 8.82% (n = 9) including 5 cases (4.90%) of urethrorrhagia and 4 cases (3.92%) of external male genital infiltration. Niang *et al.* [9] reported 13% morbidity, such as aspiration (n = 1), urethrorrhagia (n = 4) and extravasation of irrigating fluid in the external genitalia (n = 3). Morbidity was 5% in the series by Benjelloun *et al.* [7]. Zheng *et al.* [14], comparing classic EU (cold slide) to that using Laser from a review of the literature on 7 articles with 453 patients concluded that the efficacy was similar in regarding the rate of recidivism in the short and long term. However, the laser group had a lower risk of bleeding and a lower reoperation rate, but a longer operation time. Mortality after EIU is zero in the literature [3] [6] [7]

After a one-year follow-up, our results were considered good in 75.49% (n = 77) and poor in 24.51% (n = 25). Guirassy S *et al.* [2] in the same department reported 51.80% good results after a follow-up of one. This difference could be explained by the selection of patients and the experience gained over these 2 decades. Our results were similar to those of Benjelloun *et al.* [7] who reported 75.4% good results. A success rate of 77% after 369 UIE in 225 patients has been reported by Holm-Nielsen *et al.* [15]. A success rate of 42% after EU on recur-

rent urethral strictures after urethroplasty has been reported by Sukumar *et al.* [5]. In this last study, this rate was higher than that of a urethral dilation, better after a replacement urethroplasty compared to an anastomotic urethroplasty [5]. All these results corroborate and make the EIU a low morbid technique that offers good results.

The analysis of the recurrences according to the etiologies, the type of the urethral catheter, the duration of catheter wearing, the extent of the urethral strictures and the number of this made it possible to retain the following: recurrences were more observed in infectious strictures. Eighty-four percent (84%) of these recurrences were of infectious origin and 12% (n = 3) of iatrogenic origin. The post-infectious sclero-inflammatory etiology was found in 70% of treatment failure cases in the series by Niang *et al.* [9]. For other authors, risk factors for failure of EU were the penile site of urethral stricture (as opposed to bulbar stenosis), extensive lesions (>1 cm or >2 cm) and etiology traumatic [16] [17] [18].

- the latex probe was the most associated with recurrence (32.43%). Recurrence went from 20% when the urethral catheter was made of silicone to 32.43% when the latter was made of latex. The reaction of the latex on the mucosa predisposes to recurrence [3]. In the series by Ze Ondo *et al.* [19], 86% of their patients had worn a latex catheter.
- the longer the length of time the catheter was worn, the higher the recurrence rate. This rate had gone from 24.68% for a probe port of fewer than 4 days to 30% if the latter was greater than 4 days. In the past, some authors kept the urethral catheter for 2 to 3 weeks [3] [6] to hope for a remodeling of the urethra around the catheter. This attitude does not give more good results than if the catheter were withdrawn between 3 and 5 days [7] [9]. In his series, AK Patrice and al. left the urethral probe in place for an average of 14 days motivated by urethrotomy made difficult on the one hand by the significant fibrosis, and on the other hand by the existence of false routes observed in the extensive stenosis [20]. Prolonged wearing of a urethral catheter would instead expose to a new infection of the urethra and genital tract in addition to its inconvenience. We believe that if the patient did not have a cystostomy and the EIU was easy, the catheter could be removed between the 3rd and 4th day. On the other hand, the presence of a cystostomy or a laborious EIU would require keeping the urethral catheter for 5 to 7 days. Stephenson *et al.* [13] in a multicenter randomized study reported that the EIU was performed on an outpatient basis and the patient was readmitted on the 2nd or 3rd day for catheter ablation.
- the longer and more multiple the stenosis was, the more it was associated with high rates of recurrence with 44.44% and 30% respectively. In the series by Djé K *et al.* [6], among the recurrences, 1 in 2 involved strictures extending over 3 cm. In that of Niang *et al.* [9], multiple strictures had only 3.27% good results.

The relatively small size of our sample remains the main limitation of our

study. Despite this limitation, our conclusions are generally quite close to the data in the literature on the subject.

## 5. Conclusions

UIE is a first-line endoscopic surgical technique for the treatment of urethral strictures. It offers little morbidity, short hospital stays and good results.

Long and multiple infectious strictures as well as the length of time the urethral catheter was worn were strongly associated with the occurrence of recurrences.

## Ethics Committee

The research protocol for this work was initially approved by the urology department before being validated by the Ethics and Research Committee of the Faculty of Medicine of Gamal Abdel Nasser University in Conakry.

## Funding Source

This work has not received funding.

## Conflicts of Interest

The authors declare that they have no conflict of interest regarding this work.

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