

Iatrogenic Urethral Stenoses: Epidemiological Aspects Clinics and Therapeutic in the Urology Department of the National Hospital of Conakry

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Abstract

The aim is to highlight the epidemiological, clinical and therapeutic aspects of iatrogenic urethral strictures. **Methodology:** This was a retrospective study, descriptive type, 6 years from January 1st 2012, to December 31st 2017 carried out in the Urology-Andrology department of the National Hospital Ignace Deen of Conakry. All records of patients carrying the Diagnosis of iatrogenic urethral stricture were included in this study. **Results:** We collected 30 cases of iatrogenic urethral stricture, with a frequency of 2.5%. The average age of the patients was 62.33 years. The most affected age group is from 71 to 80 years (33.33%). Dysuria was the main reason for consultation. Retrograde urethrocytography plus voiding cystourethrography (RUC-VCU) allowed us to make the diagnosis. The treatment was essentially surgical and several techniques were used. Endoscopic internal urethrotomy alone was the most performed surgical technique, followed by segmental uretrectomy associated with end-to-end urethrography. **Conclusion:** Iatrogenic urethral stricture is easy to diagnose but difficult to manage due to the frequency of recurrences. Improving the quality of care, in particular urethral catheterizations and transurethral endoscopic maneuvers, makes it possible to prevent it.

Keywords

Stenosis, Urethra, Iatrogenic, Conakry

1. Introduction

Urethral stricture or stricture is a permanent reduction in the caliber of the

urethra, constituting an obstacle to the normal flow of urine [1]. It is said to be iatrogenic when it follows an act of care [2]. The healing of the initial lesion will lead to a more or less complete obstruction of the lower urinary tract with, in the long run, chronic retention of urine and risk of chronic renal failure.

The incidence of this condition is increasing due to the proliferation of endourethral maneuvers on the one hand and on the other hand, due to the insufficiency in the training of the personnel involved in the realization of these gestures [3]. The management of iatrogenic urethral strictures still remains a problem in many situations because poor initial management frequently leads to disability throughout life.

In France, at the urology department of the University Hospital of Poitiers in 2011, A. Rouanet and Coll. [4] found in 9 years, 24 cases of iatrogenic urethral stricture (IUS) representing all urethral strictures (US).

In Cameroon, in 2017 Ngaroua et Coll. [1] found 12 cases of IUS or 21.05% of the US.

In West Africa, the IUS represented in 2015: in Benin 21.7% of the US [5] [6]; in Burkina Faso 29.1% of the U.S. and 9% of the U.S. in Senegal [3].

In Guinea, in 2001, S. Guirassy *et al.* [7] had recorded in 9 years, 22 cases of IUS which represented 4.20% of the US.

The multiplicity of risk factors, namely the conditions for the placement of urethral catheters, the development of endourology and the absence of previous studies on this clinical entity in Guinea justify the realization of this study.

The aim of this work is to highlight the epidemiological, clinical and therapeutic aspects of iatrogenic urethral strictures in the urology department of the University Hospital of Conakry.

2. Material and Methods

This is a descriptive retrospective study over a period of six (6) years from January 1st 2015 to December 31th 2020, involving 30 patients, and was carried out in the Urology-Andrology department of the National Hospital Ignace Deen of Conakry.

Inclusion criteria:

Were included in this study, patients hospitalized and operated for iatrogenic urethral stricture during the study period with a medical file including, a clinical observation, retrograde urethrocytography and voiding cystourethrography (RUC/VCU)

Exclusion criteria: All patients with diagnosis other than iatrogenic urethral stricture were excluded from this study; incomplete records and patients hospitalized outside the study period.

The variables of the study: They were divided into: Sociodemographic variables:

Frequency: number of cases of iatrogenic urethral stricture compared to other urethral pathologies treated in the department during the study period.

Age: This is the number of completed years lived between the day of birth and the day of admission to our service, we have divided into age groups with a range of 10 years. The average was calculated and the extremes specified.

Clinical variables: We clinically assessed the reasons for consultation, the circumstances of occurrence of iatrogenic urethral stricture; associated lesions and initial management. Reasons for consultation:

Dysuria: This is a difficulty in urinating which results in a decrease in normal urinary flow. Pollakiuria: These are too frequent urinations and low volume without modification of the diuresis.

Urgency: The patient is forced to urinate as soon as he perceives the need.

Urinary burning: it is a burning pain felt during urination.

AUBR: It is a total and sudden inability to perform urination when the needs arise.

CIUBR: It is the impossibility of completely emptying the bladder after urination, it can be with or without distention. If the post-voiding residual <300 ml (without distension); ≥ 300 ml (with distension).

CCUBR: It is a total impossibility to perform urination in a patient with a long history of dysuria. The circumstances of occurrence: circumstance having contributed to the genesis of the iatrogenic stricture of the urethra (history of endourethral manipulation, prolonged wearing of a urethral catheter, prostate surgery, and endoscopic surgery).

Biology:

CBEU + Culture: cytobacteriological examination of urine in search of germs by direct examination and by culturing identified germs and sensitivity to antibiotics.

Creatininaemia: Blood concentration of creatinine, it allows the study of global renal function expressed in micromole/ml.

Imaging:

RUC + VCU: Allows the characteristics of the stenosis to be established (site, extent, degree of stricture, number).

- **The seat of the stenosis:** That is to say the urethral segment affected by the stenosis; the patients were distributed according to the site; either membranate, bulbar, penile or associated.

- **Length:** Corresponds to the length of the stenosis, measured in centimeters or millimeters, the patients were divided into short stenosis and long stenosis.

- **Short stenosis:** Any stenosis <2 cm

- **Long stenosis:** Any stenosis ≥ 2 cm

- **The number:** The patients were divided according to the uniqueness or the multiplicity of the iatrogenic urethral stricture.

- **The degree of stricture:** Allows the stenosis to be divided into 2: loose stenosis (allowing the contrast product to pass); tight stenosis (not allowing the contrast product to pass).

- **The opening or not of the bladder neck** with formation of the funnel.

- **Evaluation** of post-voiding residue
- Complications of obstruction (fistula, bladder stones, diverticulum, uretero-hydronephrosis, reflux, etc.).

Therapeutic variables: Corresponds to the therapeutic methods used to treat patients.

Medical treatment: All treatments received by patients via the enteral and/or parenteral route during the pre, per and post-operative period. It consisted of administering: Antibiotics; Analgesics; Antispasmodics.

Surgical treatment: Set of surgical gestures that allowed to treat patients; it was: Endoscopic internal urethrotomy; Segmental urethrectomy followed by end-to-end urethrorrhaphy; Urethroplasties with or without pedicled or free flaps.

The duration of hospitalization: This is the time expressed in days that our patients spent in the service. We have broken down these lengths of stay: 0 - 7 days; 7 - 15 days and 15 - 21 days. Ethical consideration: All the sheets were numbered, while respecting anonymity to maintain the confidentiality of the data.

Difficulties:

- Poor maintenance of medical records.
- The no computerization of medical records
- The absence of a urodynamic assessment, in particular the flowmeter.

3. Results

TEXT 1: Distribution of patients according to emergency drainage mode.

In this study, 60% of patients had received emergency cystostomy drainage and 40% had not benefited from any gesture.

4. Discussion

Iatrogenic urethral stricture (IUS) currently occupies a growing place among the other types of urethral stricture (US), due to the too often systematic and immoderate use of the urethral catheter and the development of transurethral endoscopy. From January 1, 2012 to December 31, 2017, we collected 1200 cases of urethral strictures. Among them, 30 cases of IUS were the subject of our study with a proportion of 2.5% of iatrogenic urethral stricture (**Figure 1**) out of all urethral strictures.

Our results are lower than those found by S. Guirassy *et al.* [7] in 2001 who reported 22 cases of IUS over 9 years, (4.20%) of IUS out of all US. This difference can be explained by the duration and the small size of our sample.

The age of our patients ranged from 5 to 86 years with an average age of 62.33 years, IUS can occur at any age, in children, adults and the elderly after a urogenital gesture. However, in our study, the most affected age groups were 71 to 80 years old with a frequency of 33.33% followed by that of 61 to 70 years old with a frequency of 26.67% (**Table 1**).

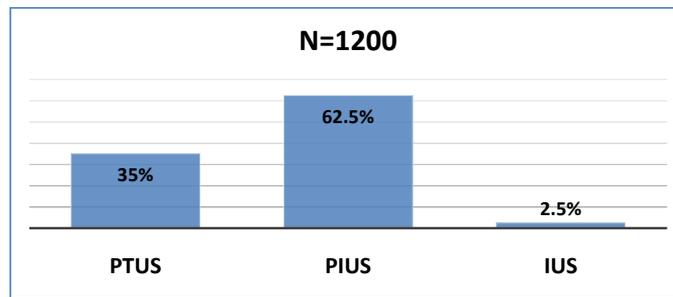


Figure 1. The frequency of iatrogenic urethral stenosis compared to other urethral strictures.

Table 1. Distribution of patients by age.

Age (year)	Number	Percentage
≤40	3	10
41 - 50	3	10
51 - 60	3	10
61 - 70	8	26.67
71 - 80	10	33.33
>80	3	10
Total	30	100

Average Age = 62.33 ans **Extreme Age** = 5 and 86.

Our results are different from those found in Côte d'Ivoire in a urology department whose average age was 55 years, but with a maximum peak between 60 - 80 years [8] [9]; In a similar study in Togo [10], 95 patients were registered and the mean age was 44.71 ± 18 years with extremes of 16 and 87 years. And in Kenya [11], the average age was 42.7 years. The predominance of these age groups could be explained by the fact that iatrogenic urethral stricture can strike at all ages.

The main symptom of iatrogenic stenosis was the dysuria present in all our patients (Figure 2). Data on urethral stricture in developing countries differ from literature data from developed countries [12]. Thus, in these countries almost all of the patients are admitted to a specialized structure at the stage of pure dysuria, according to a study published in 2011 in AUA-SI (American Urological Association–Symptom Index) which notes that the clinical picture was dominated by dysuria [13].

In our studies, this form was associated with other symptoms such as Pollakiuria (50%), Urgenturia (33.33%), burning while urinating (16.67%).

Chronic bladder urinary with 50% or 15 cases followed by acute bladder urinary retention with 10% or 3 cases, requiring emergency urinary drainage by suprapubic catheterization (Figure 2).

In our series, urethral catheterization was the most frequent source of IUS 60% (Table 2). Our results are superior to those of H. BOUJNAH [12], who noted that urethral catheterization was the cause of IUS in 15.78% of cases (n = 100).

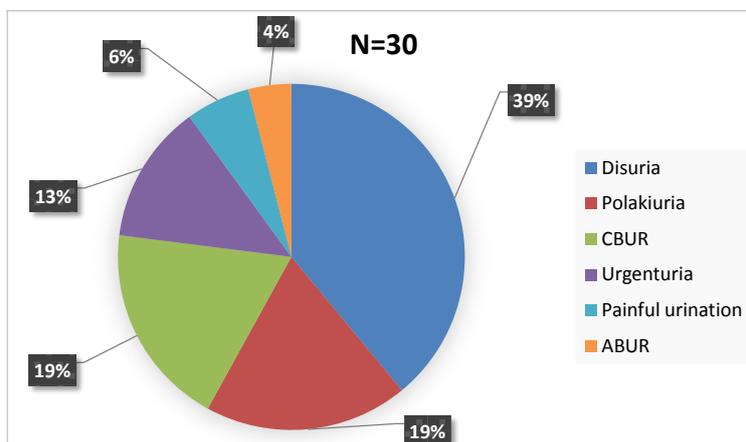


Figure 2. Distribution of patients according to the reasons for consultation.

Table 2. Distribution of patients according to the circumstances of occurrence.

Circumstances of occurrence	number	Percentage
□TURB	2	6.67
Uréthral catheterisazion	18	60
Prostatic Adénomectomy	10	33.33
Total	30	100

Transurethral resection of the bladder.

Some authors have concluded that the most important etiologies of urethral strictures were of iatrogenic origin (45%) and they were dominated by urethral manipulations (trauma by catheterization, trans-urethral interventions, correction of hypospadias, prostatectomy, brachytherapy) [14] [15]. This finding was the same in many series [14] [16] [17]. Iatrogenic causes are most often due to endoscopic maneuvers [18].

The latex Foley catheter was the most used in our patients 50%. Raibaut [19] in his study recommends the use of hydrophilic catheters because they limit friction on the urethra during catheterization, which would result in a reduced risk of IUS. This type of material was not commonly used in our patients because of its high price.

Apart from the nature of the material used, the technique of placing an indwelling catheter can also be the cause of the stenosis (Table 2). Numerous studies have demonstrated the value of proper training of medical and paramedical personnel in reducing complications related to endourethral maneuvers, in particular the occurrence of IUS [20] [21] [22]. A correct application of all these preventive measures would certainly allow a better standardization of endourethral maneuvers so as not to transform them into harmless acts.

All our patients had benefited from a cytobacteriological study of urine (CBSU). Culture was sterile in 80% of cases and positive in 20% of cases.

In this study, E. Coli was the most found germ 50% (3 cases), followed by Klebsiella 33.33% (2 cases) and staphylococci 16.67% (Table 3).

Table 3. Distribution of patients according to Cytobacteriological examination of Urine (CBEU).

CBEU	Numbers	Percentage
<i>E. coli</i>	3	50
Staphylocoques	1	16.67
Klebsiella	2	33.33
Culture stérile	24	80
Total	30	100

In the series of Ouattara Z. and Coll. [23], 39 patients, (57.4%), had urine colonized by germs, of which *Escherichia coli* was the most found with 12 cases, (17.6%).

Many of our patients were seen after multiple treatment attempts (mainly untimely antibiotic therapy).

It would be beneficial for these patients to benefit from early diagnosis and effective management to avoid associated infectious complications.

In our series we found an increase in serum creatinine in 15 of our patients (50%), and 15 other patients had normal serum creatinine (Table 4), whereas P. Barnaud and Coll. [24] estimated the frequency of chronic renal failure at 11.53%. On the other hand, other authors [25] report its extreme rarity. H. BOUJNAH [12] described one case out of a series of 100 files.

Above all, in this case, we should emphasize the importance of early diagnosis and treatment, as it is true that this complication poses difficult therapeutic problems due to the very fact of its impact on the general condition of the patient.

In our study, all our patients had benefited from the RUC/VCU. The confirmation of the diagnosis of urethral stenosis using radiological examination (RUC/VCU), allowed us to specify the seat of the stenosis in relation to the different anatomical segments of the urethra, its length, the number, the degree of stricture, the importance of upstream dilation and its repercussions especially on the bladder.

It appears from our study that the attack of the bulbar portion of the urethra was the most frequent with 22 cases or 73.34% followed respectively by the penile + membranous urethra, Penile + bulbar and membranous urethra (Table 5). Our data were superior to those of K.H. Sikpa *et al.* [26], who reported in their series that the bulbar urethra was the most affected with 67.6% of cases, and those of A.

C. Ze Ondo [3] who reported respectively 42.6% and 54% of cases of bulbar stenosis

In this study, the degree of stricture was less tight 73.33% (22 cases) allowing the contrast product to pass in the majority, and 26.67% of tight strictures not allowing the contrast product to pass (Table 6).

Table 4. Distribution of patients according to renal function.

Créatinin in $\mu\text{mol/l}$	Numbers	Percentage
62 à 124	15	50
124 à 200	14	46.67
>200	1	3.33
Total	30	100

Table 5. Distribution of patients according to the site of iatrogenic urethral stricture.

Site of de la IUS	Number	Percentage
Bulbar	22	73.34
Pénile + Membranous	4	13.33
Pénile + Bulbar	3	10
Membranous	1	3.33
Total	30	100

Table 6. Distribution of patients according to the degree of stricture of the iatrogenic urethral stricture.

Degree of stricture of the IUS	Number	Percentage
Not tight allowing the product to pass through Contrast	22	73.33
Very tight not allowing the product to pass Contrast	8	26.67
Total	30	100

The urethral stenosis with single lesion type was largely majority with 23 cases (76.67%) and multiple in 23.33% of cases (**Table 7**). As for the uniqueness of the narrowing, the same observation had been made in the series of Benjelloun [16], of N'démanga Kamoune [27], and also in those of Mhiri and Coll. [28], who had carried out their research on 158 cases, of which 135 cases presented single strictures, against 23 cases of multiple strictures. Giannakopoulos from Kammenos [29] in Greece found 53 cases of single stricture out of 70 cases. These results are comparable to our result.

The length of the short stenosis was the most represented with 24 cases or 80% against the long stenosis 6 cases out of a total of 30 patients (**Table 8**). SANTUCI and Coll [30] found a comparable result with an average length of 1.5 cm. It should be noted that the length of the stenosis plays an important role in the therapeutic choice.

On the therapeutic level of iatrogenic urethral strictures, the treatment was essentially surgical and several techniques were performed. Endoscopic internal urethrotomy alone was the most performed surgical technique in 23 cases (76.67%), followed by segmental urethrectomy associated with end-to-end urethrorrhaphy in 4 cases, 13.33% (**Table 9**). This frequency has been found by many authors (**Table 10**).

Table 7. Distribution of patients according to the number of iatrogenic urethral stricture.

Number of stricture	Number	Percentage
one	23	76.67
Multiple	7	23.33
Total	30	100

Table 8. Distribution of patients according to the extent of iatrogenic urethral stenosis.

Length of the Stenosis	Number	Percentage
Short stenosis < 2 cm	24	80
Long stenosis \geq 2 cm	6	20
Total	30	100

Table 9. Distribution of patients according to surgical treatment.

Surgical treatment	Number	Percentage
Endoscopic internal urethrotomy	23	76.67
Segmental urethrectomy + Terminal-terminal urethroraphy	4	13.33
Ur�throplasty in 1 time	1	3.33
Ur�throplasty in 2 times	2	6.67
Total	30	100

Table 10. Distribution of patients by length of hospital stay.

Hospitalisation stay	Number	Percentage
0 - 7 days	9	30
7 - 14 days	17	56.67
14 - 21 days	4	13.33
TOTAL	30	100

Average duration = 9.6 days **Extreme** = 3 - 16 jrs.

Leremboure H. *et al.* [31] in France reported 115 out of 142 patients treated by this method. H. BOUJNAH *et al.* [12] in Tunisia recorded out of 162 procedures performed, 105 cases of EUI.

The high frequency of patients treated with EUI in this study would be linked to the preponderance of short, loose, single strictures without periurethral fibrosis.

However, its ease, its speed, its application at any age, its low cost compared to urethroplasties, its effectiveness for few serious complications are factors that have contributed to its dissemination and its use as first-line treatment in the management of urethral stricture iatrogenic [9].

5. Conclusions

Iatrogenic urethral stricture currently occupies an increasing place among the

other types of urethral strictures, due to the too often systematic use of the urethral catheter and the development of transurethral endoscopy.

The circumstances of occurrence of iatrogenic urethral strictures were dominated mainly by urethral catheterization and the latex Foley catheter was the most used.

Retrograde urethrocytography coupled with voiding cystourethrography was the reference examination for diagnosis. Endoscopic internal urethrotomy was the most performed surgical technique, followed by segmental urethrectomy associated with end-to-end urethrorrhaphy.

Iatrogenic urethral stricture could be avoided by improving the quality of care including urethral catheterizations, and transurethral endoscopic maneuvers.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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