International Journal of Clinical Urology
2025, Vol. 9, No. 2, pp. 170-179
https://doi.org/10.11648/j.ijcu.20250902.21

Research Article

Epidemio-clinical and Therapeutic Aspects of the Pyeloureteral Junction Syndrome in the Urology Department of the Cocody Chu from 2001 to 2023

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Abstract

Objective: To study the pyeloureteral junction syndrome in the urology department of the UHC (University Hospital Center) of Cocody. *Methodology:* This is a retrospective, analytical study, covering a period of twenty-two years (January 2001 to December 2023) of patients with pyeloureteral junction syndrome in the department. Only confirmed cases were included. *Results:* We collected 15 cases in 22 years, giving an annual average of 0.7 cases. The average age was 31.5 years, ranging from 20 to 60 years. The M/F sex ratio was 1.5. The diagnosis was postnatal in all our patients. Lumbar and/or abdominal pain was noted in 11 patients (73.3%). Provoked lumbar and/or abdominal pain, lumbar and/or abdominal mass were the most common physical signs (93.3%). The involvement was right in 9 cases (60%) and bilateral in one patient (6.7%). Uroscan was performed in all our patients and confirmed the diagnosis. Renal function was normal in 93.33% of cases. Urine culture was performed in 13 of our patients (86.67%) and returned sterile in 60% of cases. Nephrectomy was performed in 10 patients (66.7%), pyeloplasty in 5 patients (33.3%). *Conclusion:* Uroscanner is the reference examination, having been performed in all patients, it allowed us to confirm the diagnosis. The management in our series was dominated by nephrectomy which reflects the late diagnosis and management.

Keywords

Ureteropelvic Junction Syndrome, Postnatal Diagnosis, Uroscanner, Pyeloplasty

1. Introduction

Ureteropelvic junction (UPJ) syndrome refers to the mechanical or functional obstruction of the pelvi – ureteric junction preventing the proper passage of urine from a wide cavity (renal pelvis) to a narrow cavity (ureter) resulting in upstream pyelocalicial dilation also called hydronephrosis. It is the most common cause of hydronephrosis in children [1]. It is the most common obstructive malformation uropathy in children and also the most common malformation in adults [2]. It can be functional or mechanical, congenital or secondary linked to the presence of a lower polar vessel.

The pathophysiology of the condition as well as the etiopathogenesis remain obscure; the obstruction of the pyelo

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Received: 28 September 2025; **Accepted:** 15 October 2025; **Published:** 30 October 2025

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-ureteric junction does not result from a single phenomenon [3-6]. UPJ syndrome is most commonly seen in boys and frequently affects the left side; its frequency varies from 1 to 10 per 5000 births in the general population [7-9].

In Ivory Coast, 21 cases of PUJ syndrome were recorded in a retrospective study (April 2018 to June 2023) in the pediatric surgery department of the Mother and Child Hospital of Bingerville by A. Guillaume, representing a frequency of 4.2 cases/year [12]. JPU syndrome is bilateral in 5% of cases in adults and in 25 to 30% of cases in newborns. Diagnosis can be made both in the postnatal and antenatal periods [13].

In developed countries, the rise of antenatal diagnosis by ultrasound allows early management in neonatology, thus reducing the number of nephrectomies in PUJ syndrome [14]. Alongside ultrasound, examinations such as renal scintigraphy and uroscanner remain the examinations of choice [15, 16]. Open pyeloplasty or laparoscopy according to the KUSS-ANDERSON HYNES technique remains the reference treatment [2, 11, 17].

The aim of our work was to contribute to the reduction of the number of nephrectomies in UPJ syndrome in the urology department of the Cocody University Hospital.

2. Patients and Method

This was a retrospective descriptive cross-sectional study on the epidemio -clinical and therapeutic aspects of PUJ syndrome at the Cocody University Hospital center from 2001 to 2023, a period of 22 years.

These were all patients with ureteropelvic junction syndrome in the urology department of the Cocody University Hospital during this study period.

Ureteroplevic junction syndrome diagnosed and confirmed, either by intravenous urography (IVU) or by uroscanner and having been hospitalized in the urology department.

All suspected cases of PUJ syndrome that were not confirmed, lost files, unusable files as well as patients not diagnosed in the department were not included in this series.

Data collection was carried out using individual patient survey forms. The data used were: consultation records and patient hospitalization records.

The variables studied were:

Frequency and incidence, sociodemographic characteristics, clinical data, paraclinical data, treatments received, therapeutic results, morbidity and mortality, sex, age, clinical stage, time to treatment, occurrence of complications.

All data were analyzed using SIATA software version 16.

The graphs and tables were created using Statistical Package for the Social Sciences (SPSS) 16.0 and Word 2016 office software.

The KHI-2 test was performed to search for relationships between variables.

Differences were considered statistically significant at $p<0.05$.

3. Results

3.1. Sociodemographic Data

Frequency

During the period of our study, which extends from January 2001 to December 2023, 15 cases of PUJ syndrome were recorded in the urology department of the Cocody University Hospital Center, i.e. 0.7 cases/year.

Sex

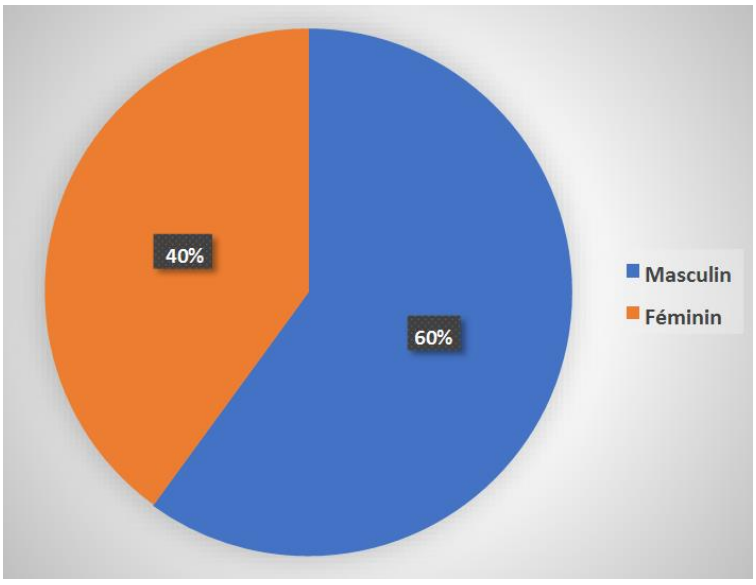

Figure 1. *Distribution of patients by gender.*

Of the 15 cases studied, 9 were men, i.e. 60.0% with a sex ratio of 1.5.

Age

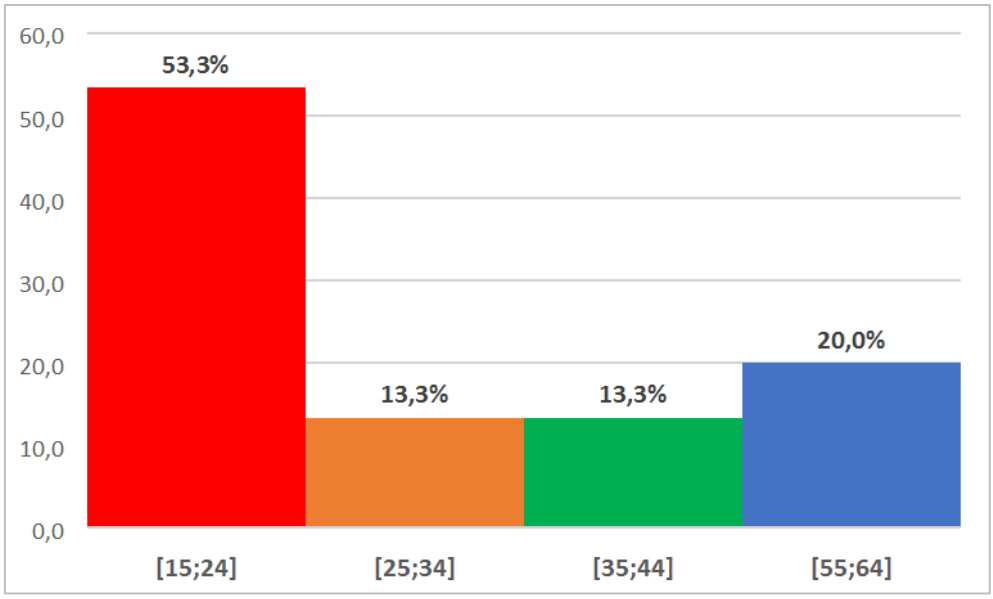

Figure 2. *Distribution of patients according to age groups.*

The most represented age group was [15-24] with a frequency of 53.3%, the average age was 31.5 years with extremes from 20 years to 60 years.

3.2. Circumstances of Discovery

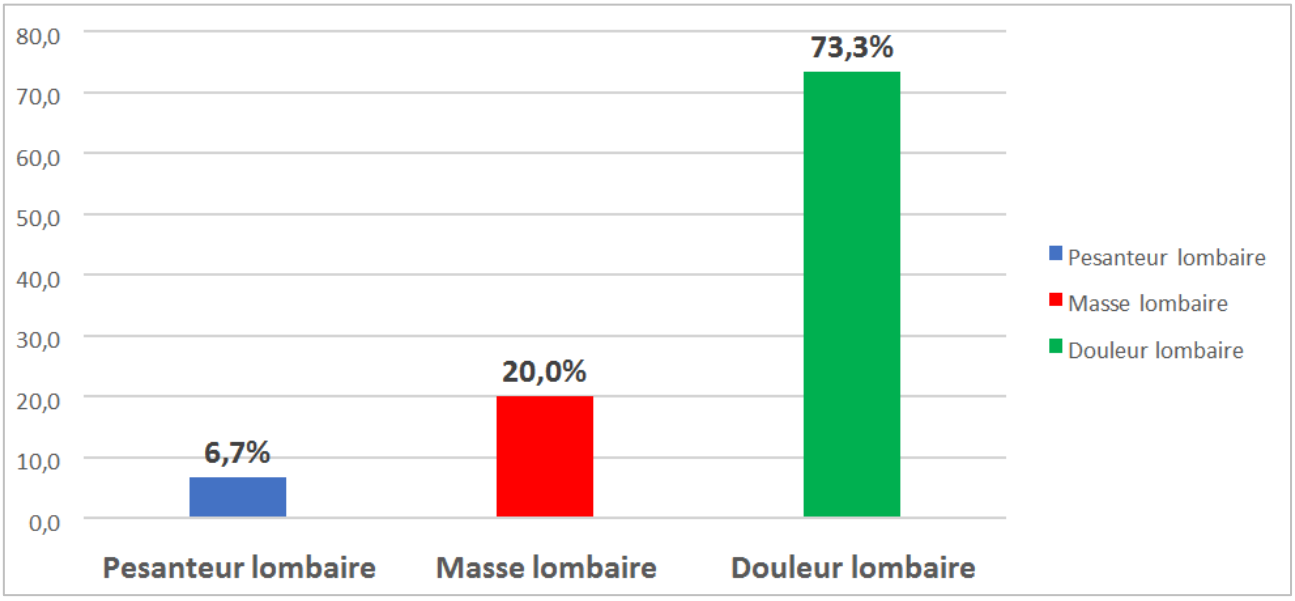

Figure 3. *Distribution of patients according to the circumstances of discovery.*

Lower back pain was the most common circumstance of discovery with a proportion of 73.3%.

3.3. Reasons for Consultation

Table 1. Distribution of patients according to the reason for consultation.

Reason for consultation	Effective	Percentage (%)
Right iliac fossa pain	3	20
Lumbar pain	9	60.0
Lumbar mass	3	20.0
Total	15	100.0

The most frequent reason for consultation in our series was lower back pain, at 60%.

3.4. Laterality

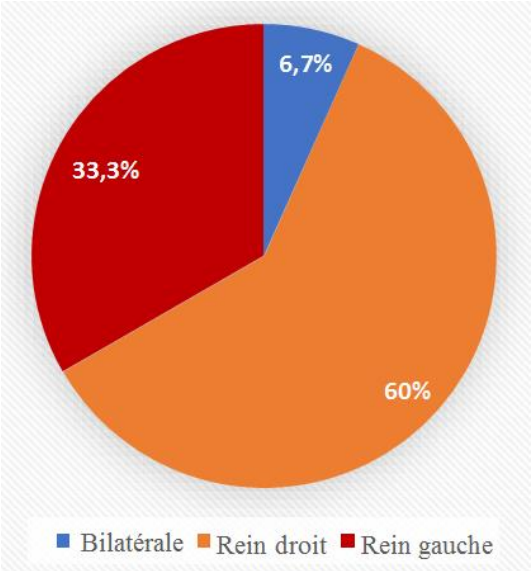

Figure 4. Distribution of patients according to laterality.

The right side was the most affected with 9 patients or 60%.

3.5. Physical Signs

Table 2. Distribution of patients according to physical signs.

Physical signs	Effective	Percentage (%)
Lumbar pain and/or abdomonal provoke	8	53.3
Lumbar and/or abdominal mass	6	40
Lumbar contact and/or renal winding	2	13.3
Normal physical exam	4	26.7

In 26.7% of cases the physical examination was normal.

3.6. Uroscanner

Table 3. Distribution of patients according to the results of the uroscanner.

Results	Actual (N)	Percentage (%)
Left sjpu with hydronephrosis	3	20.0
Sjpu right with hydronephrosis	6	40.0
Sjpu bilateral with hydronephrosis	1	6.7
Right sjpu with renal parenchyma laminated	2	13.3
Left sjpu with hydronephrosis and mute kidney	1	6.7
Right sjpu with hydronephrosis and mute kidney	2	13.3
Total	15	100.0

All patients had a Uroscanner.

3.7. Function Renal

Table 4. Distribution of patients according to the results of uremia and creatinine levels.

	Normal	Abnormal	Total
Renal Function	14	1	15
Percentage (%)	93.33	6.67	100.0

Only one patient, or 6.67%, had renal failure.

3.8. Cytobacteriological Examination of Urine (ECBU)

Table 5. Distribution of patients according to the result of the ECBU.

Results	(N)	Percentage (%)
Positive	4	26.67
Negative	9	60.00
Undocumented	2	13.33
Total	15	100.00

Only 4 patients had a positive urine culture, i.e. 26.67%.

3.9. Pre-therapeutic Complications

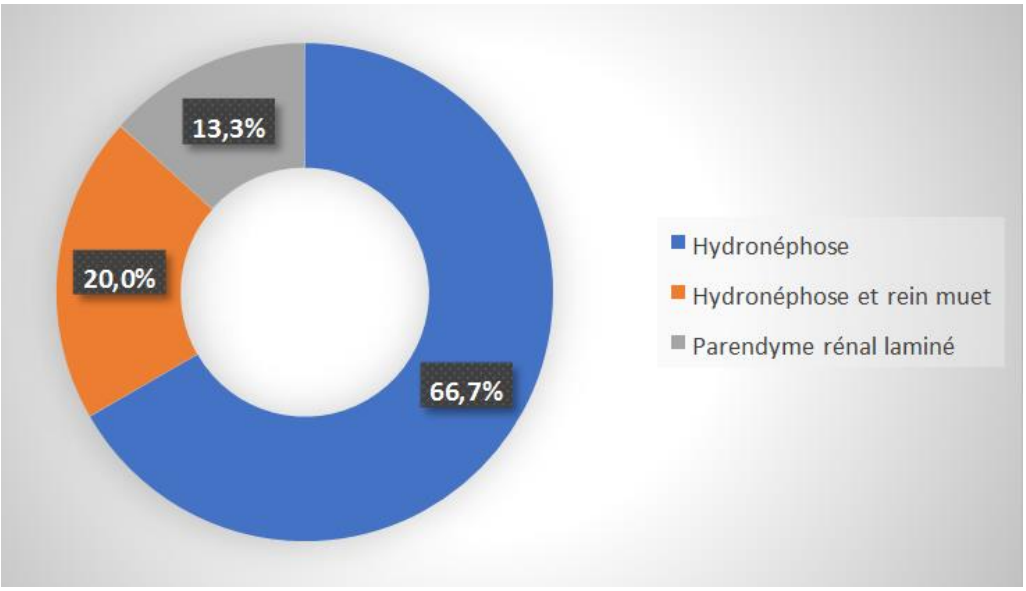

Figure 5. *Distribution of patients according to evolving complications.*

All patients experienced a progressive complication.

3.10. Treatment

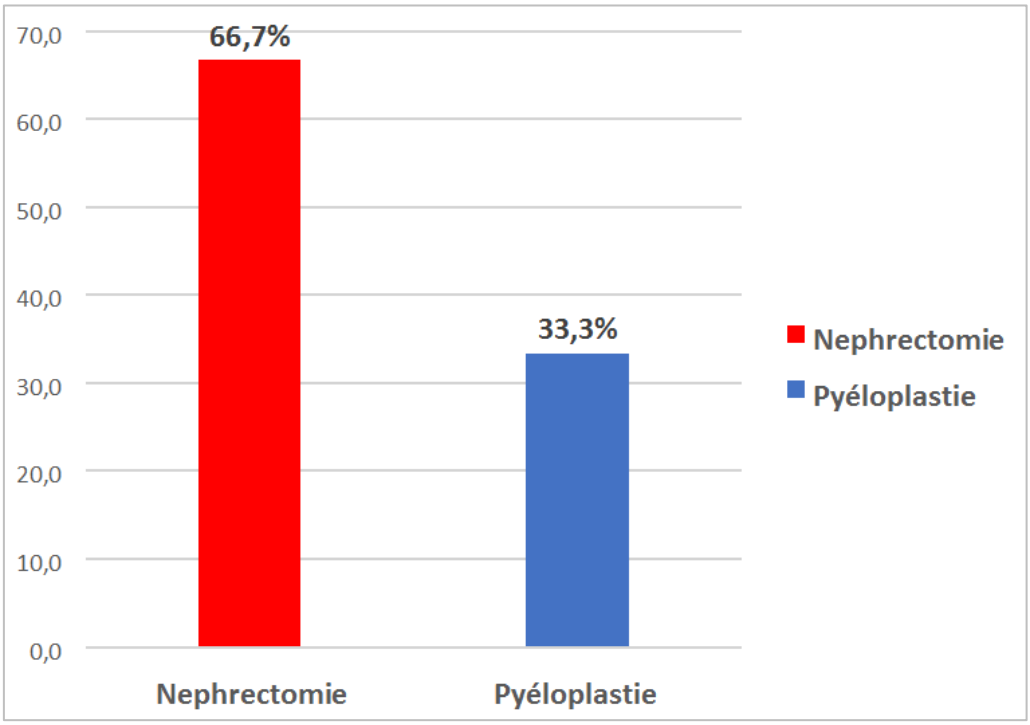

Figure 6. *Distribution of patients according to the technique used.*

Nephrectomy was performed in 10 cases or 66.7%.

3.11. Drainage

Table 6. Distribution of patients according to the type of drainage.

Kind	Effective	Percentage (%)	Average drainage duration
Double j stent	06	40	04 months
Trans- drainage anastomotic of the renal compartment	09	60	14 days

Only 6 patients or 40% had a JJ probe.

3.12. Length of Hospitalization

Table 7. Distribution of patients according to length of hospitalization.

Hospitalization

Duration	Effective (N)	Percentage (%)
≤ 4 days	11	73.33
[4; 6]	3	20.00
[6; 8]	1	6.67
Total	15	100

The average length of hospitalization is 3.3 days with extremes of 3 and 7 days.

3.13. Morbi - Mortality

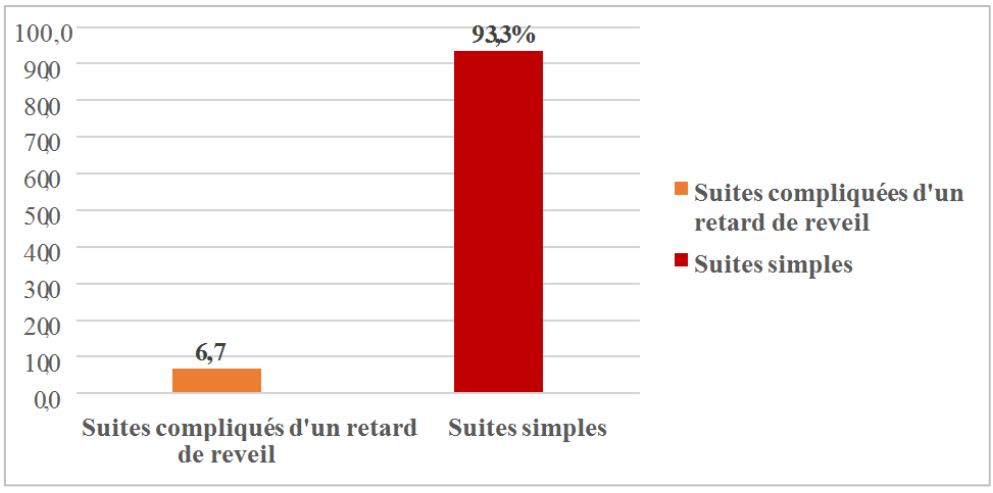

Figure 7. Distribution of patients according to post-operative morbidity and mortality.

One patient, or 6.7%, presented a postoperative complication such as delayed awakening.

3.14. Reason for Consultation

Table 8. Distribution of patients according to the reason for consultation.

Rating Achieved

Reason for Consultation	Bilateral	Right kidney	Kidney Left	Total
Lumbar pain	1	4	4	9
Solution pain	0	2	1	3
Right iliac fossa Lumbar mass	0	3	0	3
Total	1	9	5	15

Chi-square = 3.1852 p. value = 0.527

The reason for consultation and the affected side are not significantly related because the p. value > 0.05.

4. Discussion

UPJ syndrome is a malformative pathology of the upper urinary tract that is increasingly diagnosed prenatally and treated during the first years of life. However, mild forms are still discovered in adulthood due to their pauci-symptomatic nature. The main limitation of this study was its retrospective nature. The review of the files was possible thanks to the effective availability of all the files found in the documentation department. Long-term follow-up is still lacking to adequately assess the results of surgery.

It is an anomaly of intrinsic or extrinsic origin whose prevalence varies between 2 and 29 cases per 10,000 to 20,000 live births. [18] In adults, pyelo -ureteral junction syndrome can develop idiopathically or in response to various traumatic attacks and its frequency varies according to the literature.

The circumstances of discovery vary considerably depending on the country's level of health development.

Since the advent of antenatal ultrasound, JPU syndrome is increasingly diagnosed before birth, which allows early management of patients. According to BUISSON [26] an antenatal diagnosis was carried out in 50%.

In our series, the rate of prenatal diagnosis is zero, as in some countries where the rate of prenatal diagnosis also remains low, with a rate of zero and 3.2% respectively for HAYAT and MOUH [1] in Morocco. These low rates could be explained by the non-performance of ultrasound during prenatal check-ups during pregnancies.

In our series, all our patients consulted for clinical symptoms. Low back pain was the main reason for consultation; it justified the consultation in 9 patients, or 60%.

This series made it possible to objectify lumbar and/or abdominal tenderness in 8 patients, i.e. 53.3%, as well as a lumbar and/or abdominal mass in 6 patients, i.e. 40%.

JPU syndrome does not significantly affect the general condition except in the case of rare complications such as renal failure.

In our series the majority of patients (13) or 86.7% presented a satisfactory general condition, this rate is compatible with those of ASSANDE [12] and DIARRA [19] which are respectively 95.24% and 92.3%.

In our series, we noted a predominance of the right side with percentages very close to those found in the Lopez study [20].

On the other hand, our results went against most of the series which objectified a clear predominance of the left side without the reason being clearly specified.

Renal function is assessed by measuring uremia and creatinine levels before any intervention. These were carried out in all our patients, among whom only one, or 6.67%, had obstructive renal failure. This result contrasts with that of GALIFER [21] which obtained a frequency of 3.7% of transient renal failure, however it remains lower than those of KONE A [22] and MOUH [1].

Our low frequency of renal failure can be justified by the fact that, in our series, we had only one bilateral form because renal failure is found in the case of bilateral form.

ECBU is routinely performed in cases of PUJ syndrome due to its frequent association with urinary tract infection [23]. It was performed in 11 of our patients, i.e. 73.3%, was positive in 36.4% and the most frequently found germ was Escherichia Coli in 75% of cases.

Among the rare series where ECBU has been studied we find the GALIFER series [21] with a positive ECBU in 52.4% of patients and a predominance of Escherichia Coli.

These relatively high rates can be explained by the associated pyelic urinary stasis. In contrast, TSAI [24] only found a positive ECBU in 6% of its patients.

In the literature, several radiological examinations are requested to confirm the diagnosis of PUJS.

These are mainly ultrasound, uroscan, IVU and renal scintigraphy.

These examinations make it possible to establish the diagnosis of the disease, to assess the repercussions on the upper urinary tract, to study the separate functional value of the kidneys, to look for associated vesicourethral reflux, lithiasis and an anomaly of the urinary tract. [19, 25-27]

In our series, two radiological examinations were performed. These are essentially ultrasound and uroscanner, whereas in the series of DARHOUR [10] in Senegal in 2016 and KIRAKOYA [5] in Burkina Faso in 2015, the diagnostic couple was ultrasound and IVU.

This can be explained by the fact that IVU is abandoned in our practice in favor of other radiological examinations such as uroscanner and MRI.

As for renal scintigraphy, it was not performed in our study because it is relatively recent in our practice.

The treatment of PUJ syndrome has changed profoundly as many advances have been made. It ranges from simple monitoring and/or nephrostomy to surgical treatment or endoscopic treatment. [10]

Supervised surgical abstention is indicated in cases of prenatally diagnosed PUJ syndrome because spontaneous improvement is noted in infants by simple tissue maturation in a large proportion of cases. [9]

This monitoring can be associated with medical treatment (anti-inflammatory, analgesic, antiseptic, antibiotic) depending on the situation in the event of urinary infection or associated vesicoureteral reflux [10].

When the diagnosis is postnatal, the literature suggests that surgery should be performed as early as possible. [9]

In our series, 5 patients (33.3%) underwent conservative open surgery, pyeloplasty using the KUSS ANDERSON HYNES technique.

Nephrectomy was the treatment performed in the majority of cases (10) or 66.7% of cases. This result is far superior to that of RB Galifer et al [21] who obtained a frequency of 5.9%.

This high frequency of nephrectomy in our patients is justified by the destruction of the renal parenchyma due to the delay in consultation.

Lumbotomy was the preferred approach in our study.

In our series, the most used material for drainage was the transanastomotic drain of the renal compartment and the average duration of drainage was 14 days, similar to the MOUH series [1].

However, for GUYS [28], trans-anastomotic drainage is useless in the face of a pyelo -ureteral anastomosis performed without difficulty, which does not present watertight tension at the end of the intervention.

In our series, the average length of hospitalization was 3.3 days. This corresponds to that of DANJOU [29] which was 3 days.

In the literature, postoperative complications are multiple and varied.

Some are related to the pathology and others to surgery in general. We recorded a morbidity of 6.7%. This rate is lower than that of DIARRA [19] in Mali and those of the Moroccan and French authors. This difference could be explained by the size of the sample, the operative techniques and the follow-up time.

We had a zero postoperative mortality rate. This rate is comparable to that of Assande AG [12] which recorded zero mortality. These zero mortality rates in our context could be explained by the quality care and the awareness of the children's parents regarding the seriousness of the JPU syndrome.

5. Conclusion

PUJ syndrome is a relatively uncommon uropathy in our daily practice.

Ultrasound and computerized tomography scan, (CT scans) play a key role in the investigation of this pathology. Lumbar and/or abdominal pain were the main reasons for consultation. The male sex was the most common, and right-sided involvement was the most common.

Uroscanner is the reference examination, having been performed in all patients, it allowed us to confirm the diagnosis. The management in our series is dominated by nephrectomy which reflects the diagnosis and late management.

Regardless of the stage of development, PUJ syndrome must always be taken seriously given the serious complications that can range from total kidney destruction to renal failure in bilateral forms and can be life-threatening for the patient.

Abbreviations

UHC	University Hospital Center
UPJ	ureteropelvic Junction
IVU	Intravenous Urography
SPSS	Statistical Package for the Social Sciences
ECBU	Cytobacteriological Examination of Urine
CT scans	Computerized Tomography Scan

Author Contributions

Benjamin Kouame: Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Validation, Visualization, Writing – review & editing

Felicite Nykan Kramo: Investigation, Methodology, Writing – original draft, Writing – review & editing

Issoufou Coulibaly: Formal Analysis, Investigation, Methodology, Writing – original draft

Ali Drabo: Data curation, Formal Analysis, Writing – original draft

Conflicts of Interest

The authors declare no conflicts of interest.

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