

Practice of Endo-Urology in the Centre of Ivory Coast: Overview and Results

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How to cite this paper: Avion, K.P., Akassimadou, N., Aguia, B., Zouan, F., Alloka, V., Kamara, S. and Dje, K. (2023) Practice of Endo-Urology in the Centre of Ivory Coast: Overview and Results. *Open Journal of Urology*, 13, 407-417.

<https://doi.org/10.4236/oju.2023.1310047>

Received: June 28, 2023

Accepted: October 14, 2023

Published: October 17, 2023

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Abstract

Background: Endoscopic exploration and treatment of urinary tract disorders, whether by retrograde, percutaneous or endoscopic approach, defines endo urology. **Objective:** To report the results of endo urology practice in Bouaké during the two practice sessions. **Patients and Methods:** Cross-sectional and descriptive study of patients followed up and had benefited from exploration and/or endoscopic surgery in Bouaké. Our study was carried out in a facility in Bouaké, for two years, from January 2021 to December 2022. The parameters of interest were clinical, diagnostic, endoscopic procedure and results. **Results:** During the study period, 157 patients underwent endoscopic exploration and/or intervention. The mean age was 58.9 years (range 28 - 90 years). Males predominated with 95.5% (n = 150). Acute urinary retention was the most frequent reason for consultation (55.41%). Benign prostatic hyperplasia (BPH) was the most frequent pathology at 22.92% (n = 36). Urethrocytostomy was performed in 52 cases (33.12%), Transurethral resection of the prostate (TURP) in 36 cases (22.92%), Endoscopic resection of secondary cervical sclerosis in 23 cases (14.64%), Endoscopic internal urethrotomy (EUI) in 15 cases (9.55%) and Transurethral resection of the bladder (TURB) in 10 cases (6.36%). Post-operative management was straightforward in 93.63% of cases (n = 147). Operative times of between 21 and 35 minutes were more frequent in 55.41% of cases (n = 87). Urinary tract infections accounted for 3.8% (n = 6) of surgical morbidity. The germ responsible for the infections was essentially *Escherichia coli* (*E. coli*). The mean duration of post-operative urinary drainage was 5.5 days (range: 4 - 6 days) for patients who underwent TURP, TURB and endoscopic resection of secondary sclerosis of the bladder neck. The mean duration of drainage after endoscopic internal ureterotomy was 21.6 days (range 14 - 30 days). Of the 157 endoscopies performed, 154 patients (98.08%) had a favourable outcome, with adenomyofibroma of the

prostate being the most common histological type (52.17%, n = 36). Mortality was 1.27% (n = 2) in our series. **Conclusion:** Endo urology should be the urologist's first choice for both exploration and surgery, given the satisfactory results.

Keywords

Endo Urology, Uretrocystoscopy, TURP, EIU, TURB

1. Introduction

Endoscopy in urology brings together all the minimally invasive techniques used to explore and treat certain pathologies of the urinary tract by means of optical equipment called an endoscope. It dominates the practice of urology in developed countries. Endoscopic exploration and treatment of disorders of the urinary tract, whether by retrograde, percutaneous or laparoscopic route, defines endo-urology [1]. Endo-urology has revolutionised the practice of urology, as it allows operations to be carried out through natural passages without opening the walls, under the control of a device called an endoscope. Endoscopic surgery is a minimally invasive, elegant and attractive technique, with many undeniable advantages for the patient. It is less invasive than laparotomy, can be performed at any age, requires no incision, causes less cosmetic damage, has a low risk of adhesion, reduces the length of hospital stay, is comfortable post-operatively, allows patients to return to work quickly and reduces morbidity and mortality [2] [3] [4]. It was introduced into the therapeutic armoury of urologists in Côte d'Ivoire in 1982 by Dje *et al.* [5], but in Bouaké the practice of endo-urology is recent. To this end, we conducted a preliminary study with the aim of reporting the various explorations and/or endoscopic procedures performed and the results in Bouaké.

2. Patients and Methods

- Study design and approval

After obtaining the approval of the ethics committee of the private facility and the university hospital of Bouaké (Ivory Coast), we conducted a cross-sectional and descriptive study of the medical records of patients followed and having undergone exploration and/or endoscopic surgery. This study was conducted in a private facility in Bouaké for two years, from 01 January 2021 to December 2022.

- Inclusion and non-inclusion criteria

All patients who underwent endoscopic exploration and/or surgery were included in the present study. Patients who underwent any other means of exploration or open surgery were excluded from our study. All endoscopies were performed on sterile urine. Patients who underwent endoscopic surgery were systematically subjected to a preoperative work-up consisting of: haemogram, par-

tial thromboplastin time (PTT), prothrombin rate (PT), uremia, creatinemia, electrocardiogram, pulmonary radiography, and urine cytobacteriological examination (UCE).

The endo-urological equipment consisted of:

- ✓ A urethrotome
- ✓ A CH 21 cystoscope
- ✓ Sheath resector 26CH
- ✓ 30 degree optics
- ✓ Monopolar electric current
- ✓ A continuous irrigation system using glycine with cut/coagulation set at 130/70 W
- ✓ ELLIK bulb for recovery of swarf after resection
- ✓ A cold light source

Data were collected using a survey form containing the parameters studied and entered using Word software. EPI-Infos 7 software was used to analyze the data.

The parameters studied were: Age, sex, reason for consultation, pre and per operative diagnosis, endoscopic procedure performed, duration of operation, outcome of operations, duration of post operative drainage and mortality.

3. Results

During our study period, 157 patients underwent endoscopic exploration and/or endoscopic intervention, the results are as follows.

3.1. Epidemiological Data

3.1.1. Age

The mean age of the patients was 58.9 years, ranging from 28 to 90 years.

The most represented age group was 61 - 70 years in 58.5% (n = 92), **Table 1**.

3.1.2. Sex

In our series, men represented the majority of patients with 96.1% (n = 151), **Table 2**.

Table 1. Distribution of patients by age group.

| Parameters | Numbers | Percentage |
|------------|---------|------------|
| 28 - 38 | 11 | 7 |
| 39 - 50 | 15 | 9.5 |
| 51 - 60 | 17 | 10.8 |
| 61 - 70 | 92 | 58.5 |
| 71 - 80 | 19 | 12.1 |
| 81 - 90 | 3 | 1.9 |
| Total | 157 | 100 |

Table 2. Distribution of patients by sex.

| Parameters | Numbers | Percentage |
|------------|---------|------------|
| Women | 6 | 3.8 |
| Men | 151 | 96.1 |
| Total | 157 | 100 |

3.2. Clinical Data

Reason for Consultation

Acute retention of urine was the most frequent reason for consultation with 55.41% (n = 87), followed by dysuria 25.47% (n = 40) and haematuria 9.55% (n = 15), **Table 3**.

3.3. History and Comorbidity

The majority of patients had no urological history 61.78% (n = 97). 15 patients had hypertension and 9 had diabetes as comorbidities. These represented 9.55% and 5.73% respectively.

3.4. Diagnosis

3.4.1. Pre-Operative Diagnosis

The diagnosis of benign prostatic hyperplasia (BPH) predominated in 22.92% (n = 36), **Table 4**.

3.4.2. Intraoperative Diagnosis

The intraoperative diagnosis was dominated by benign prostatic hyperplasia with 33.12% (n = 52), **Table 5**.

3.5. Endoscopic Procedures

Urethrocystoscopy was the most common endoscopic procedure with 33.12% (n = 52) followed by TURP 22.92% (n = 36), **Table 6**.

3.5.1. Associated Procedures

We performed procedures associated with endoscopy in 49 patients, and dilatation with a benique was most often associated with endoscopy 15.92% (n = 25), **Table 7**.

3.5.2. Duration of Procedure

Procedures lasting between 21 and 35 minutes were the most common, 55.41% (n = 87), **Table 8**.

3.5.3. Anatomopathology

Adenomyofibroma of the prostate accounted for 52.17% (n = 36) of the 69 pathological findings.

3.5.4. Operative Follow-Up

Post-operative follow-up was straightforward in 93.63% (n = 147) of cases.

Table 3. Breakdown of patients by reason for consultation.

| Reason for consultation | Numbers | Percentage |
|-----------------------------|---------|------------|
| Dysuria | 40 | 24.47 |
| Haematuria | 15 | 9.55 |
| Urinary frequency | 3 | 1.91 |
| Chronic retention | 2 | 1.27 |
| Acute Urine Retention (AUR) | 87 | 55.41 |
| Urinary urgency | 3 | 1.91 |
| Urinary burning | 3 | 1.91 |
| Haemospermia | 2 | 1.27 |
| Lumbar pain | 2 | 1.27 |
| Total | 157 | 100 |

Table 4. Distribution of patients according to preoperative diagnosis.

| Diagnosis | Numbers | Percentage |
|-------------------------------------|---------|------------|
| Secondary sclerosis of the cervix | 23 | 14.64 |
| Sclerosis of the prostatic cavity | 10 | 6.36 |
| Urethral stricture | 15 | 9.55 |
| Bladder lithiasis | 4 | 2.54 |
| BPH | 36 | 22.92 |
| Obstructive prostate adenocarcinoma | 13 | 8.28 |
| Acute prostatitis | 2 | 1.27 |
| Pyeloureteral junction | 5 | 3.18 |
| Urethral stricture | 3 | 1.91 |
| Bladder tumour | 10 | 6.36 |
| Ureteral lithiasis | 5 | 3.18 |
| Bladder neck disease | 31 | 19.74 |
| Total | 157 | 100 |

Table 5. Breakdown of patients by intraoperative diagnosis.

| Diagnosis | Numbers | Percentage |
|------------------------------|---------|------------|
| Cervical disease | 47 | 29.93 |
| Benign prostatic hyperplasia | 52 | 33.12 |
| Urethral stricture | 15 | 9.55 |
| Bladder tumour | 10 | 6.36 |
| Bladder lithiasis | 3 | 1.91 |

Continued

| | | |
|-----------------------------------|-----|------|
| Obstructive ADK | 12 | 7.64 |
| Sclerosis of the prostatic cavity | 9 | 5.73 |
| Pyeloureteral junction | 5 | 3.18 |
| Ureteral stenosis | 4 | 2.54 |
| Total | 157 | 100 |

Table 6. Distribution of patients according to endoscopic procedure performed.

| Procedure | Numbers | Percentage |
|--|---------|------------|
| Uretrocystoscopy | 52 | 33.12 |
| TURP | 36 | 22.92 |
| TURB | 10 | 6.36 |
| EIU | 15 | 9.55 |
| Resection of secondary sclerosis of the cervix | 23 | 14.64 |
| Endo-bladder cystolithotomy | 3 | 1.91 |
| Double J catheter rise | 9 | 5.73 |
| Double J removal | 9 | 5.73 |
| Total | 157 | 100 |

Table 7. Distribution of patients according to the procedure associated with endoscopy.

| Procedure associated | Numbers | Percentage |
|----------------------------|---------|------------|
| Removal of cystostomy tube | 15 | 9.55 |
| Dilatation with a benique | 25 | 15.92 |
| Bladder tumour biopsy | 5 | 3.18 |
| Bilateral pulpectomy | 2 | 1.27 |
| Bilateral orchiectomy | 2 | 1.27 |
| No associated procedure | 108 | 68.78 |
| Total | 157 | 100 |

Table 8. Distribution of patients according to length of procedure.

| Time in minutes | Numbers | Percentage |
|-----------------|---------|------------|
| 0 - 20 | 10 | 6.36 |
| 21 - 35 | 87 | 55.41 |
| 36 - 45 | 27 | 17.19 |
| 46 - 55 | 23 | 14.64 |
| 56 - 65 | 10 | 6.36 |
| Total | 157 | 100 |

3.5.5. Morbidity

Morbidity was dominated by urinary tract infections in general 3.82% (n = 6); **Table 9**.

3.5.6. Germs Found on Antibiotic Susceptibility Testing

The most frequent germ was *E. coli*, accounting for 66.66% of cases.

3.5.7. Length of Hospital Stay

The average length of hospital stay was 4.7 days, with extremes of 1 to 7 days.

3.5.8. Outcome of Endoscopic Procedures

Out of 157 endoscopies performed, only 1.9% resulted in failure of the procedure (n = 3).

3.5.9. Average Post-Operative Drainage Time

The average duration of post-operative drainage was:

- Average of 5.5 days, with extremes of 4 to 6 days for patients who had undergone TURP, TURB and endoscopic resection of secondary sclerosis of the cervix.
- Average of 21.6 days, with extremes ranging from 14 to 30 days, for patients who underwent EIU.

3.5.10. Mortality

Mortality was 1.27% (n = 2) in our series.

4. Discussion

Endo-urology has revolutionised the practice of urology, both in exploration for aetiology and in surgical management, and its introduction into our therapeutic arsenal has reduced the major complication of open surgery such as surgical site infections in our practice. In our series, the average age of patients was 58.9 years. This result, which shows an age greater than 50 years, is in line with that reported by MAHAMAT in his study in N'DJAMERA, who reported an average age of 53.54 years [1]. Other authors such as DIAKITE [6] in MALI and OFOHA [7] in NIGERIA reported an average age of 62 and 63.8 years respectively. However, cases of patients under 50 years of age were reported by COULIBALY and colleagues in Côte d'Ivoire in their study of prostatic adenectomy in twins [8]. Our result could be explained by the prevalence of

Table 9. Distribution of patients according to morbidity.

| Morbidity | Numbers | Percentage |
|------------------------------|---------|------------|
| Urinary tract infection | 4 | 2.54 |
| Recurrent urethral infection | 1 | 0.63 |
| Orchi-epididymitis | 2 | 1.27 |
| Vesico-rectal fistula | 1 | 0.63 |
| Haemorrhage | 2 | 1.27 |

cervicoprostatic pathologies, which increases from the age of fifty (50), and also by physiological ageing. Male patients predominated in our study (95.5%). The same observation has been made in the literature [3] [4] [5]. Our result could be due to the high frequency of urogenital pathologies in men, as opposed to women. We found that acute retention of urine was the most frequent reason for consultation, at 55.41%. This finding was made by MAHAMAT [1], LOTTERSTATTER [3] and DIALLO [9]. The high frequency of urinary retention in our series reflects the long evolution of the pathologies and also the delay in patient consultation.

From a diagnostic point of view, benign prostatic hyperplasia was the most frequent pathology with 22.92%. This is consistent with studies by SAHIN [10], WANG [11] and SHABBIR [12] in which benign prostatic hyperplasia was the urogenital disease with the highest frequency. Our results confirm the thesis that adenomyofibromatous hyperplasia of the prostate is the most frequent benign pathology in men over fifty (50) years of age. In our study, we found that urethroscopy was the most frequently performed endoscopic procedure (33.12%). This result is close to that of other authors. It was 36.3% in the MAHAMAT study in N'Djamena [1]. The common practice of urethroscopy in urology consultations could justify our results.

The exploration and surgical treatment of pathologies of the upper urinary tract require appropriate endoscopic tools such as rigid or flexible urethroscopy for diagnostic urethroscopy and interventional urethroscopy for stone fragmentation [13]. As we did not have this equipment, we mainly used double J endoprotheses, *i.e.* 5.73%. This is much lower than the results reported by ZAKOU in SENEGAL [14] and PEDJA in Morocco [15], which were 54.55% and 30.12% respectively.

Transurethral resection of the prostate accounted for 22.92% of endoscopic procedures performed. Our rate is lower than that of DIAKITE in MALI [6], LOUSAIEF in TUNISIA [16] and NOURI in MOROCCO [17] which were respectively 57.7%, 58% and 52.18%. But higher than the rates reported by other authors such as KANE in SENEGAL [18], KAMBOU [19] and ZONGO [20] in BURKINA FASSO who noted respectively 18.5%, 10% and 8.11%. Our results show the importance of trans-urethral resection in the surgical management of benign prostatic hyperplasia.

We performed 23 endoscopic resections of the bladder neck, *i.e.* 14.64%. This was the second most common endoscopic procedure in our series. It was used to treat secondary sclerosis of the bladder neck by removing the sclerotic and fibrous tissue stenosing the bladder neck. In 2000, XAVIER GAME *et al.* [21] experimented with this technique for the treatment of chronic retention of urine after urinary incontinence. These spectacular results led him to describe the technique as effective, quick to perform, minimally invasive and without morbidity or mortality.

Endoscopic internal urethrotomy (EIU) accounted for 9.55% of endoscopic procedures performed during the study period. It alone accounted for 28.7% in

the series by MAHAMAT [1]. EIU is a simple technique, which can be repeated, with simple postoperative follow-up and a shorter hospital stay. In our series, it was the third most common endoscopic procedure. It was indicated for short, simple strictures. Complicated or complex forms of urethral stricture were reserved for urethroplasty.

Trans-urethral resection of the bladder (TURB) accounted for 6.34% in our study. This result is close to that of MAHAMAT [1] in N'Djamena, who reported 7% of TUR in his study. TUR remains an essential examination for the diagnosis of bladder tumours on the one hand, and on the other hand occupies a place of choice in the initial treatment of these tumours. The low number of trans-ureteral bladder resections could be explained by the unavailability of endo-urological equipment in our public centres. 55.41% of operations last less than 1 hour. MAHAMAT *et al.* [1] reported average times of 23.2 minutes for UIE and 45.98 minutes for RTUP. In 2016, DIAKITE in MALI reported an average duration of 40 minutes [6]. These short endoscopic times reflect the skill and experience of the surgeon and the quality of the endoscopic equipment.

The post-operative course was simple in 93.63% of cases. However, we observed 3.8% complications, mainly urinary tract infections with *Escherichia coli* as the main germ. DIAKITE reported 5% complications [6], MAHAMAT [1], 27.3% haemorrhagic complications. Other authors have reported cases of bladder explosions during endoscopic manipulations [22]. This low complication rate in our study could be explained by the mastery of the different procedures and the scrupulous respect of the different endoscopic intervention times.

The average length of hospital stay was 4.7 days. DIAKITE [6] reported 3 days, DJE [5] 12.53 hours. These different lengths of hospital stay confirm the thesis that endo-urology has a short hospital stay. 98.08% of operations were successful. Three (3) procedures (1.9%) were unsuccessful. This low failure rate has been noted by several authors in the literature [5]-[10].

Our study finds its strength in the rigorous methodology, the first carried out to our knowledge in Bouaké in the center of the Ivory Coast. It lifted the veil on the panorama of endoscopic explorations and/or interventions over two years of practice of endourology. However, it has its limits. It is a cross-sectional and descriptive study therefore these results deserve external validation with an independent and larger sample. It would be helpful if future studies with a larger sample size were done to substantively judge our results. We believe, however, that these results are clinically relevant due to their strong characterization in the real-life context.

5. Conclusion

The results of our study have enabled us to assess the extent of endoscopic procedures performed in Bouaké. The results show that ureterocystoscopy and trans-ureteral resection of the prostate are the most common endoscopic procedures, both in terms of diagnostic exploration and surgical management. The reduced intervention time, the reduction in morbidity and mortality, and the

short length of stay all bear out the reliability of endo-urology.

Authors' Contributions

AVION Kouassi Patrice, AKASSIMADOU N'diamoi, AGUIA Brice: statistical analysis and re-reading of the article as well as its drafting.

ZOUAN Freddy, ALLOKA Venance, KAMARA Sadia, DJE Koffi: documentary research and editing of the work.

Ethical Considerations

We have protected the confidentiality of the information gathered during the survey. Thus, an anonymity number was assigned to each survey form with authorisation obtained from the administrative and health authorities.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- [1] Mahamat, L.M., Valantin, V., Ndormadjita, A.S., Okim, A. and Moussa, K. (2020) Expérience de la prise en charge endoscopique de service d'urologie de l'hôpital général de référence nationale (HGRN) de N'DJAMENA, TCHAD. *Urologia e Andrologia*, **2**, 45-49.
- [2] Halidou, M., Kodo, A., Diongole, H., Zakou, A., Adamou, H., Doucthi, M., *et al.* (2022) Bilan d'activité de 10 ans de pratique d'endoscopie urologie au NIGER: résultats, défis et perspectives. *European Scientific Journal*, **18**, 228-238. <https://doi.org/10.19044/esj.2022.v18n14p228>
- [3] Lotterstatter, M., Seklechner, S., Wimpissinger, F., Gombos, J., Bektic, J., Stolzlechner, P., *et al.* (2022) Résection trans-urétrale de la prostate chez 85 patients: Une étude rétrospective multi antique. *Journal Mondial d'urologie*, **40**, 3015-3020. <https://doi.org/10.1007/s00345-022-04179-w>
- [4] Saddam, H., Aldemoura, Mohammad, A.B. and Mohammad, A.Z. (2022) L'effet de la résection trans-urétrale de prostate sur les fonctions érectiles et éjaculatoires chez les patients atteints d'hypertrophie bénigne de prostate. *Urologia Internationales*, 1-7.
- [5] Dje, K., Coulibaly, N. and Sangare, S. (1999) l'Uretrotomie interne endoscopique dans le traitement du rétrécissement urétral acquis du noir africain: À propos de 140 cas. *Médecine d'Afrique Noire*, **46**, 56-61.
- [6] Diakite, M., Berte, H., Diallo, M., Kambou, D., Banou, P. and Diakite, A. (2016) la résection endoscopique bipolaire: Expérience du service d'urologie CHU de point G. *Urologia e Andrologia*, **1**, 264-268.
- [7] Ofoha, G.C., Edoke, J.R., Dakun, N.K., Shuaibu, S.I., Akhaine, J. and Yaki, M.I. (2021) Prise en charge chirurgicale de l'hypertrophie bénigne de la prostate au NIGERIA: Adénomectomie versus résection trans-urétrale de la prostate. *The Pan African Medical Journal*, **39**, Article No. 165. <https://doi.org/10.11604/pamj.2021.39.165.24767>
- [8] Coulibaly, N., Akassimadou, N., Dje, K., Yao, B., Bogni, L. and Avion, K.P. (2012) Adénomectomie prostatique trans vésicale chez des jumeaux. *Afrique Biomédicale*, **17**, 111-113.

- [9] Diallo, M., Konate, M., Konate, S., Keita, M., Samake, A., Diassuna, M., *et al.* (2020) Adénome de la prostate dans l'unité de chirurgie générale du centre de santé de référence de la commune VII du district de BAMAKO. Aspects cliniques, paracliniques et thérapeutiques. *Health Sciences and Disease*, **21**, 1-4.
- [10] Sachin, B. and Cam, H.K. (2021) L'approche actuelle des patients masculins présentant des symptômes des voies urinaires inférieures. *Journal of Urological Surgery*, **8**, 130-134.
- [11] Wang, J.W. and Man, L.B. (2020) Trans Urethral Resection of the Prostate Structure Management. *Asian Journal of Andrology*, **22**, 140-144.
<https://doi.org/10.4103/aja.aja.126.19>
- [12] Shabbir, A., Tariq-Khan, U., Nisar, D., That, P.K., Kamari, C., Zehra, T., *et al.* (2021) Frequency and Trends of Prostatic Diseases in a Subset of Karachi Population: A Retrospective Study. *Pakistan Journal of Medicine and Dentistry*, **10**, 17-23.
- [13] Dje, K., Avion, K.P., Akassimadou, N., Konan, P.G. and Coulibaly, N. (2018) Ureterscopie interventionnelle pour calcul: Notre expérience à propos de 13 cas. *Urologia e Andrologia*, **1**, 455-459.
- [14] Zakou, A.R.H., Ndoeye, M., Niang, L., Jalloh, M. and Lahou, I. (2018) Dérivation du haut appareil urinaire par une sonde JJ: Indication et résultats dans une étude rétrospective et mono centrique. *African Journal of Urology*, **24**, 303-307.
<https://doi.org/10.1016/j.afju.2018.08.001>
- [15] Pedja, E.I., Barra, A.V., Lmezguidi, K., Janane, A., Ghadouane, M., Ameer, A., *et al.* (2015) Ureterscopie souple laser dans le traitement des calculs du haut appareil urinaire: Résultats à propos de 166 interventions. *Pan African Journal*, **22**, 13-20.
<https://doi.org/10.11604/pamj.2015.22.13.7591>
- [16] Loussacef, H., Bennis, M., Ben Hassine, L., Chebil, M. and Ayed, M. (1995) Traitement de l'adénome de la prostate: Chirurgie ouverte ou resection trans urétrale de la prostate ? À propos de 681 cas. *Tunisie Chirurgicale*, **6**, 110-115.
- [17] Nouri, M., Elkhadir, El Fessi, J., Koutani, A., *et al.* (1999) L'hypertrophie bénigne de la prostate: Aspects cliniques et thérapeutiques à propos de 1280 cas opérés. *Annales d'Urologie*, **33**, 243-251.
- [18] Kone, R., Ndaye, A. and Ogoubemy, M. (2013) Resection trans urétrale de prostate. Expérience de l'hôpital principal de DAKAR, SENEGAL. *Médecine d'Afrique Noire*, **60**, 110-114.
- [19] Kambou, T., Zong, B., Ekoue, F., Traore, A.C., Bonkougou, B., Ouattara, T., *et al.* (2006) Traitement chirurgical de l'hypertrophie bénigne de la prostate au CHU senou souro de BOBO DIOULASSO (BURKINA FASSO) résultats à court et moyen terme—À propos de 190 cas. *Médecine d'Afrique Noire*, **53**, 605-612.
- [20] Zongo, S., Kambor, T. and Sanou, A. (2002) La resection trans urétrale de la prostate à l'hôpital banou souro de BOBO DIOULASSO à propos de 68 cas. *African Journal of Urology*, **8**, 1-5.
- [21] Gani, X., Malavaud, B., Mouzin, M., Braud, F., Rischmann, P., Sarra Mon, J., *et al.* (2000) Traitement des retentions chroniques d'urine après cure chirurgicale d'incontinence urinaire par resection trans urétrale du col vésical. *Progrès en Urologie*, **10**, 629-633.
- [22] Jihad, E.A., Najib, A., Younes, E.H., Oumar, G., Driss, T., Mohammed, L., *et al.* (2013) L'explosion intra vésicale au cours des procédures de résections endoscopiques. Un incident dangereux qui peut être évité. *Canadian Urological Association Journal*, **7**, 517-519. <https://doi.org/10.5489/cuaj.416>