


Nephrectomy for Non-Functioning Kidney at the Ouakam Military Hospital: A Five-Year Retrospective Study

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Abstract

Introduction: The destruction of renal parenchyma is a complex process resulting from acute or chronic affections. Simple nephrectomy is indicated in the management of irreversible destruction of renal parenchyma due to benign affections. The aim of this study is to describe the diagnostic, etiological, and therapeutic aspects of non-functional kidney treated in the urology department of the Ouakam Military Hospital. **Patients and Method:** This was a retrospective, descriptive, single-center study of cases of nephrectomy for non-functioning kidney in the Urology-Andrology Department of the Ouakam Military Hospital between January 1st, 2019 and December 31st, 2023. **Results:** Forty-seven nephrectomies were indicated for non-functioning kidney (83.9% of all nephrectomies). The average age of the patients was 38.8 years and the sex ratio was 1.23. The functional signs were dominated by lumbar pain and hematuria, and computed tomography urography enabled the diagnosis of non-functioning kidney in all patients. The destruction of the renal parenchyma was caused by upper urinary tract stones (53.2%), pyeloureteral junction syndrome (25.5%), iatrogenic ureteral stenosis (14.8%), tuberculous pyonephrosis (4.25%), and calcified double J stents (2.13%). All patients underwent open surgery. **Conclusion:** Nephrectomy for non-functioning kidney remains a common practice in our setting. Despite recent advances in diagnostic and therapeutic methods, preventable causes of non-functioning kidney are still the primary indications for nephrectomy.

Keywords

Non-Functioning Kidney, Benign Conditions, Nephrectomy

1. Introduction

The destruction of renal parenchyma is a complex process resulting from acute or chronic pathologies. Understanding the pathophysiological mechanisms is essential for the early management of these conditions and the preservation of renal function. The treatment of renal affections has been revolutionized by the development of early diagnostic methods. Simple nephrectomy is indicated for the management of non-functioning kidney due to benign pathologies. In developed countries, laparoscopic nephrectomy has largely replaced open surgery due to its advantages in terms of morbidity and postoperative recovery [1]. Nevertheless, in many developing countries, including Senegal, open nephrectomy remains a common technique, particularly due to technical and material constraints.

The aim of this study is to describe the diagnostic, etiological, and therapeutic aspects of non-functional kidney treated in the Urology Department of the Ouakam Military Hospital.

2. Patients and Method

This was an observational, descriptive, retrospective, single-center study of cases of nephrectomies for non-functional kidney in the urology department of the Ouakam Military Hospital over a five-year period from January 1st, 2019 to December 31st, 2023.

The diagnosis of non-functional kidney was based only on uro-computed tomography data showing total destruction of the renal parenchyma associated with the absence of contrast medium secretion and excretion on urographic images. Renal scintigraphy was not performed as it is only available at one hospital and is inconsistently.

The parameters studied included age, gender, medical and surgical history; clinical aspects during diagnosis; renal function before and after nephrectomy; preoperative imaging results; causes of non-functioning kidney; duration of hospitalization, and postoperative complications.

3. Results

During the study period, 56 nephrectomies were performed in the urology department of the Ouakam Military Hospital, of which 47 nephrectomies (83.9%) involved non-functioning kidney and 9 radical nephrectomies (16.1%) were performed for kidney cancer. All patients underwent open surgery, and the approach was a lumbotomy for nephrectomies for non-functioning kidneys.

There were 26 men and 21 women, giving a sex ratio of 1.23. The average age of the patients was 38.8 years, ranging from 4 to 76 years (**Figure 1**). The most frequently reported functional signs were lumbar pain followed by hematuria (**Table 1**). Regarding surgical history, eight patients had undergone pelvic or upper urinary tract surgery: ureterolithotomy (n = 2), pyeloplasty (n = 1), hysterectomy (n = 4), and cesarean section (n = 1). Uro-computed tomography revealed, in all patients, an absence of contrast medium secretion and complete destruction of

the renal parenchyma, confirming the diagnosis of non-functioning kidney. The causes of renal parenchyma destruction were dominated by upper urinary tract lithiasis (53.2%), followed by pyeloureteral junction syndrome (25.5%) and iatrogenic ureteral stenosis (14.8%) (**Table 2**).

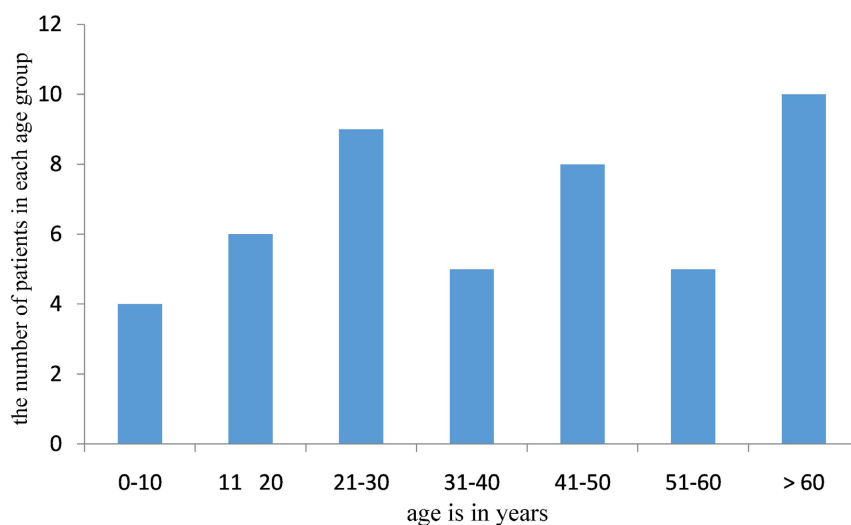


Figure 1. Distribution of patients according to age group.

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

Reason for consultation	Number	Percentage
Lower back pain	37	78.7
Hématuria	11	23.4
Weight lost/anorexia	9	19.1
Abdominal mass	3	6.3
Ureterocutaneous fistula	1	2.13

Table 2. Causes of non-functional kidneys.

Causes	Number	Percentage
Urinary tract stones	25	53.2
Pyeloureteral junction syndrome	12	25.53
Iatrogenic ureteral stenosis	7	14.89
Tuberculous pyonephrosis	2	4.25
Calcified double J stents	1	2.13
Total	47	100

The mean preoperative serum creatinine level was 13.56 mg/L, with extremes of 6.2 and 63 mg/L. Preoperative renal function impairment, based on increased serum creatinine and blood urea, was noted in six patients. After nephrectomy, the mean creatinine level was 12.73 mg/L, indicating stable postoperative renal function.

Postoperative recovery was uneventful in 89.4% of cases. Postoperative complications included surgical site infection in 8.5% (n = 4) and thrombophlebitis of the left lower limb in 2.1% (n = 1). The mean duration of hospitalization was 5.6 days. One death, due to massive pulmonary embolism, was observed one month after surgery.

4. Discussion

Nephrectomies for non-functioning kidneys remain a concern for urologists in developing countries due to the high frequency of lithiasis, late diagnosis of urological malformations, and poorly treated or untreated urinary tract infections [2]. There is a significant disparity between developed and developing countries in terms of the indications for nephrectomies for non-functioning kidneys. Nephrectomies for malignant conditions are more common than nephrectomies for benign conditions in developed countries [3]-[5]. Beisland *et al.* [6], in a series of 646 nephrectomies over 20 years, reported 33% of nephrectomies for benign conditions and 67% for kidney cancer. They also observed a gradual decrease in the indications for nephrectomy for benign conditions, from 75% in the first five years to 32% in the last years of the study. This reduction was attributed to improved diagnostic methods, the rise of minimally invasive techniques, and the wider use of effective antibiotics for the treatment of urinary tract infections.

In developing countries, delayed diagnosis due to lack of access to modern technologies and ignorance of the severity of kidney disease contributes to the persistence of advanced forms. Thus, most nephrectomies are still indicated for benign conditions, as shown in our study, where 83.9% of cases involved non-tumor-related kidney damage. Similar results were reported by Ndoye *et al.* [7] and Kassa *et al.* [8], with 53% and 73.6% of nephrectomies performed for benign kidney conditions, respectively. Other studies confirm this trend: 68.8% in Pakistan [9], 62.5% and 84% in India [1] [10]. In contrast, in Ghana and Nigeria, Otu-Boateng *et al.* [11] and Batmus *et al.* [12] reported a higher frequency of nephrectomies for kidney cancer, reaching 66.6% and 63.3%, respectively.

Clinically, lumbar pain (78.7%) was the most common symptom, followed by hematuria (23.4%). These results are consistent with those of Ndoye [7] and Andualem [13]. The presence of an abdominal mass (6.3%), observed only in children, reflects at this stage the delay in diagnosis and late management of certain obstructive uropathies.

On the technical level, laparoscopic surgery has largely replaced open surgery in developed countries [14] [15]. Numerous studies have demonstrated the superiority of this minimally invasive approach, particularly in terms of reducing postoperative complications, analgesic consumption, hospital stay, and recovery time [16] [17]. However, in developing countries such as Senegal, open surgery remains the most widely used method due to the high cost of equipment, lack of specialized training, and inadequate infrastructure [7] [9]. The major challenge in our department is to train practitioners in laparoscopy and ensure the regular procurement

of consumables.

In our series, upper urinary tract lithiasis was the main cause of kidney damage (53.2%). This result is comparable to those reported in other African and Asian studies [7] [8] [18]. Zaki *et al.* [2] and Shresha *et al.* [19] reported 52.4% and 65.5% of nephrectomies for lithiasis-induced kidney destruction, respectively. For comparison, in Zelhof's series [20] in the United Kingdom, lithiasis was responsible for only 12.9% of nephrectomies for benign conditions, reflecting a clear difference between healthcare contexts.

Pyeloureteral junction syndrome, often diagnosed late, was the second leading cause of nephrectomy indications in our series. This result is consistent with those of Datta [1] and Otu-Boateng [11], who identified it as the main cause of nephrectomy. In children, Bouhaf *et al.* [21] emphasized that this was the leading cause of obstructive uropathy leading to nephrectomy in children. Iatrogenic ureteral stenosis, observed in 12.7% of cases in our series, remains a serious complication of pelvic surgery in women. Its frequency varies between 0.9% and 2.5% according to the literature [8] [9] [22]. These benign conditions should not lead to non-functioning kidney. Access to quality medical care for the population is an effective way to avoid late diagnosis, which leads to destruction of the renal parenchyma.

The main postoperative complication was infection of the surgical site (8.5%), a complication also reported by Anduaem [13] (2.7%) and Akmal [9] (4.9%). Mortality in our series was 2.1%, a rate comparable to those observed in the literature, where it varies between 0.9% and 3.1% [6] [8] [9].

The retrospective and single-centre nature of this study constitutes a limitation. A multicentre study would allow for an approximate assessment of the national prevalence of nephrectomies for non-functional kidneys.

5. Conclusions

Nephrectomy for non-functioning kidney remains a common practice in our setting, reflecting the high prevalence of benign kidney conditions diagnosed late, such as urinary lithiasis, ureteropelvic junction syndrome, and iatrogenic ureteral strictures. Despite recent advances in diagnostic and therapeutic methods, preventable causes of destroyed kidneys are still the primary indications for nephrectomy.

This study shows that open surgery via lumbotomy remains the most used approach, despite the proven superiority of laparoscopy in reducing postoperative morbidity.

Conflicts of Interest

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

References

- [1] Datta, B., Moitra, T., Chaudhury, D.N. and Halder, B. (2012) Analysis of 88 Nephrectomies in a Rural Tertiary Care Center of India. *Saudi Journal of Kidney Diseases and*

- Transplantation*, **23**, 409-413.
- [2] Zaki, M.R., Ghazanfar, A. and Asif, K. (2012) Nephrectomy for Non-Traumatic Benign Renal Diseases: Its Indications and Outcomes in a Developing Country. *Pakistan Journal of Medical & Health Sciences*, **6**, 216-219.
 - [3] Phillips, J., Catto, J.W.F., Lavin, V., Doyle, D., Smith, D.J., Hastie, K.J., et al. (2005) The Laparoscopic Nephrectomy Learning Curve: A Single Centre's Development of a De Novo Practice. *Postgraduate Medical Journal*, **81**, 599-603.
<https://doi.org/10.1136/pgmj.2004.030148>
 - [4] Kubba, A.K., Hollins, G.W. and Deane, R.F. (1994) Nephrectomy: Changing Indications, 1960-1990. *British Journal of Urology*, **74**, 274-278.
<https://doi.org/10.1111/j.1464-410x.1994.tb16609.x>
 - [5] Glazier, W.B. (1997) Indications and Complications in 347 Patients. *Urology*, **118**, 930-931.
 - [6] Beisland, C., Medby, P.C., Sander, S. and Beisland, H.O. (2000) Nephrectomy—Indications, Complications and Postoperative Mortality in 646 Consecutive Patients. *European Urology*, **37**, 58-64. <https://doi.org/10.1159/000020101>
 - [7] Ndoye, M., Niang, L., Natchagande, M., Jalloh, M., Labou, I. and Gueye, S.M. (2014) Néphrectomies: Indications-techniques et résultats au service d'urologie de l'Hôpital Général de grand Yoff de Dakar. *URO'ANDRO*, **1**, 120-128.
 - [8] Kassa, A., Hagos, M. and Kidanu, M. (2019) Indications and Outcome of Nephrectomy in Ayder Comprehensive Specialized and Mekelle Hospital, Northern Ethiopia: A 5 Year Experience. *Ethiopian Medical Journal*, **57**, 13-18.
 - [9] Akmal, M., Mirza, Z.I. and Murtaza, B. (2017) Are We Performing a Lot of Simple Nephrectomies? *Journal of the Pakistan Medical Association*, **67**, 438-441.
 - [10] Bagalkot, V.S. and Prasad, H.L. (2019) Profile of Nephrectomy in a Tertiary Care and Teaching Hospital at Mysuru: A Retrospective Study. *Urology Nephrology Andrology International*, **4**, 61-64.
 - [11] Otu-Boateng, K., Amoah, G., Appiah, K.A.A., Azorliade, R., Gyasi-Sarpong, C.K., Maison, P.O.M., et al. (2020) Analysis of Adult Nephrectomies at the Komfo Anokye Teaching Hospital, Kumasi, Ghana. *Open Journal of Urology*, **10**, 93-100.
<https://doi.org/10.4236/oju.2020.104011>
 - [12] Badmus, T.A., Salako, A.A., Sanusi, A.A., Arogundade, F.A., Oseni, G.O. and Yusuf, B.M. (2008) Adult Nephrectomy: Our Experience at Ile-Ife. *Nigerian Journal of Clinical Practice*, **11**, 121-126.
 - [13] Andualem, D., Teklebrihan, B. and Wuletaw, C. (2002) Indications, Complications and Mortality of Nephrectomy in Tikur Anbesa General Specialized Hospital. *East and Central African Journal of Surgery*, **17**, 92-97.
 - [14] Kaba, M., Piriççi, N., Taken, K., Geçit, I., Demiray, Ö. and Eren, H. (2015) Laparoscopic Transperitoneal Nephrectomy in Non-Functioning Inflammatory Kidneys with or without Renal Stone. *European Review for Medical and Pharmacological Sciences*, **19**, 4457-4461.
 - [15] Kim, H.H., Lee, K., Park, K. and Ahn, H. (2000) Laparoscopic Nephrectomy for Non-functioning Tuberculous Kidney. *Journal of Endourology*, **14**, 433-437.
<https://doi.org/10.1089/end.2000.14.433>
 - [16] Fornara, P., Doehn, C., Friedrich, H. and Jocham, D. (2001) Nonrandomized Comparison of Open Flank versus Laparoscopic Nephrectomy in 249 Patients with Benign Renal Disease. *European Urology*, **40**, 24-31. <https://doi.org/10.1159/000049745>
 - [17] Boublil, V., Traxer, O., Sebe, P., Doublet, J.D., Gattegno, B. and Thibault, P. (2004)

La néphrectomie par laparoscopie pour pathologie bénigne du rein. *Progrès en Urologie*, **14**, 137-143.

- [18] Cissé, D., Berthé, H.J.G., Coulibaly, M.T., Diallo, M.S., *et al.* (2020) Les néphrectomies à l'Hôpital Sominé Dolo de Mopti (Mali). *Health Sciences and Disease*, **21**, 74-78.
- [19] Shrestha, A., Chhettri, P., Yadav, B.K., Basnet, R.B. and Shrestha, P.M. (2019) Urinary Stone Disease and Preventable Nephrectomies. *Journal of Nepal Health Research Council*, **17**, 238-241. <https://doi.org/10.33314/jnhrc.v0i0.1996>
- [20] Zelhof, B., McIntyre, I.G., Fowler, S.M., Napier-Hemy, R.D., Burke, D.M. and Grey, B.R. (2015) Nephrectomy for Benign Disease in the UK: Results from the British Association of Urological Surgeons Nephrectomy Database. *BJU International*, **117**, 138-144. <https://doi.org/10.1111/bju.13141>
- [21] Bouhaf, A., Dendane, A., Azzouzi, D., Belkacem, R. and Barahioui, M. (2003) Les néphrectomies totales chez l'enfant: Une expérience de 11 ans sur 80 cas. *Annales d'Urologie*, **37**, 43-46. [https://doi.org/10.1016/s0003-4401\(03\)00002-0](https://doi.org/10.1016/s0003-4401(03)00002-0)
- [22] Rafique, M. (2007) Nephrectomy: Indications, Complications and Mortality in 154 Consecutive Patients. *Journal of the Pakistan Medical Association*, **57**, 308-311.