

Place of Open Radical Nephrectomy, in the Era of Laparoscopy in Subsaharian Africa

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Abstract

Introduction: Kidney cancer is discovered in Africa often at advanced or locally advanced stages. These patients could be treated by radical nephrectomy or cytoreductive nephrectomy. Open surgery still retains its place due to the technical difficulties which are linked to the stage of the tumors in this era where laparoscopy is becoming the gold standard. Through this study, we wanted to highlight the advanced stages of patients operated by open surgery in our institution rather than laparoscopy, however, with good results. **Patients and Method:** It was a retrospective study over a period of 5 years. Were included all patients in whom radical nephrectomy had been performed during this period. **Results:** Thirty-five (35) open radical nephrectomies for kidney cancer were performed. The average tumor size was 11.6 cm (± 3.4 cm). The mean operating time was 169 min \pm 63.4 min with extremes of 115 min (1 h 55 min) and 360 min (6 h). This duration was longer for large tumors ($p = 0.002$). Intraoperative incidents occurred in 4 patients (11.4%); it was a vena cava injury (02) and a spleen injury (02). Blood loss was estimated on average at 535 ml. The mean follow-up time was 19 \pm 11 months. The overall survival rate was 90% at 3 months, 53% at 12 months and 35.4% at 24 months. **Conclusion:** The large size of kidney tumor found in Africa may constitute an obstacle to performing nephrectomies by laparoscopy. However, mastering the laparoscopic technique with appropriate equipment can help reduce operative morbidity.

Keywords

Open Radical Nephrectomy, Indications, Results, Africa

1. Introduction

Kidney cancer represents 2.2% of solid cancers in the world [1]. In 2020, the

global incidence was 431,288 with 179,368 deaths reported by GLOBOCAN. In Africa and the Middle East the standardized incidence of kidney cancer was 1.8 - 4.8/100,000 in men and 1.2 - 2.2/100,000 in women [2].

In the management of localized and locally advanced kidney cancer, radical nephrectomy is indicated and the procedure was first described by Robson in 1963 [3]. The principle of radical nephrectomy is to remove the kidney along with perirenal fat, Gerota's fascia with or without the adrenal gland with or without lymph node dissection. It can be performed laparoscopically, robot-assisted laparoscopic and open [4]. Regardless of the technique used, studies show that there is no difference in terms of specific survival and overall survival or in terms of oncological results [5]. Even though, laparoscopic and robot-assisted approaches are supposed to offer the advantages of reduced blood loss, rapid resumption of activity and fewer complications, the open route remains the reference technique for nephrectomies for large tumors and cyto-reductive nephrectomies [6].

By this study, our aim was to highlight the stages at which patients are operated by open surgery in our institution and the results of this surgery.

2. Patients and Method

This was a retrospective cross-sectional study over a period of 5 years from January 1st 2015 to December 31st 2019 at the Urology Department of the Sylvanus Olympio University Hospital in Lomé. Included were all patients in whom a radical nephrectomy had been performed during the study period. All the patients have been treated by open surgery. The parameters studied were: the tumor stage, the type of skin incision (median supra and subumbilical, subcostal, lumbotomy); additional surgical procedures performed (adrenalectomy, lymph node dissection); intraoperative incidents and postoperative complications; elements of post-operative follow-up such as: local and metastatic recurrences, renal function, patient survival. Overall survival was studied using the Kaplan-Meier estimation curve.

3. Results

During the study, thirty-five (35) radical nephrectomies for kidney cancer were performed which was 57.14% of all nephrectomies and 2.40% of all procedures performed. The average age was 46.5 ± 12.5 years with extremes of 21 years and 72 years old and women represented 70% of patients, a sex ratio of 3/1. The computed tomography was the imaging test for the diagnosis and the assessment of extension in all our patients. The average tumor size was 11.6 cm (± 3.4 cm). Thirteen (13) patients (37%) were diagnosed at stage T2bN0M0 (**Figure 1**).

Regarding surgery, all patients had undergone general anesthesia and all had been operated by open surgery. The primary routes used were the midline transperitoneal route in 19 patients (54% of cases), the anterior subcostal transperitoneal route in 9 patients (26%) and lumbotomy in 7 patients (20%). The mean operating time was $169 \text{ min} \pm 63.4 \text{ min}$ with extremes of 115 min (1 h 55

min) and 360 min (6 h). This duration was longer for large tumors ($p = 0.002$). In 20 patients (57.1%), separate ligation of the renal vessels was performed. Adrenalectomy was performed in 9 patients (25.7%). Lymph node dissection was performed in one (1) patient. Intraoperative incidents occurred in 4 patients, i.e. 11.4%; it was a vena cava injury repaired immediately with sutures, and a spleen injury that resulted in splenectomy. Blood loss was estimated on average at 535 ml with extremes of 200 and 1000 ml. Intraoperative blood transfusion was necessary in 15 patients, i.e. 42.8% of cases. The mean volume of red blood cell concentrates (RBCs) transfused was 1000 ml [± 500 ml] with extremes of 500 ml and 3000 ml. The average length of hospital stay was 7 days with extremes of 4 and 19 days.

The most common histological type was clear cell carcinoma in 80% of cases and renal papillary carcinoma in 20%. Ten (10) patients or fifty percent (50%) of patients presented lesions classified stage pT2bN0. The ISUP 3 and 4 nucleolar grades were the most represented, respectively 51.4% and 40% of cases.

In the context of postoperative monitoring, the mean follow-up time was 19 ± 11 months. Regarding prognostic classification, 65% of patients were classified in the intermediate risk group according to the UISS classification, 20% in the low group and 15% in the high risk group. Local recurrence was observed in 6 patients (17%). Four (4) patients had presented a local recurrence between 12 and 24 months including one (1) at 13 months, two (2) at 17 months and one (1) other at 20 months. Local recurrence was present in less than 12 months in two (2) patients, one (1) at 5 months and the second at 8 months after the operation. Metastatic recurrences were found in 3 patients (8.5%). Two (2) cases of lung metastasis and one (1) case of liver metastasis. Three (3) patients (8.5%) died during follow-up and all 12 months after the surgery. Among the deceased patients, two (2) were stage pT2bN0 and one (1) stage pT3N. Among the deceased patients, two (2) were classified as grade 4 ISUP and one (1) grade 3 ISUP. The overall survival rate was 90% at 3 months, 53% at 12 months and 35.4% at 24 months as shown in **Figure 2**.

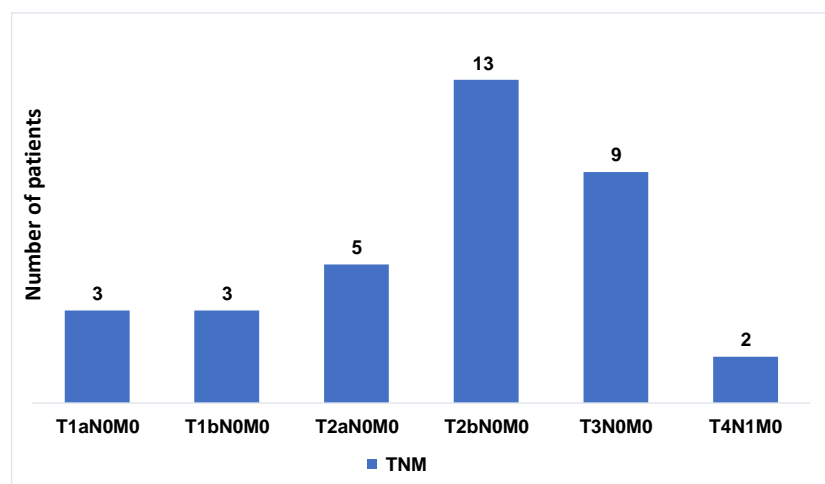


Figure 1. Distribution of patients according to TNM stage.

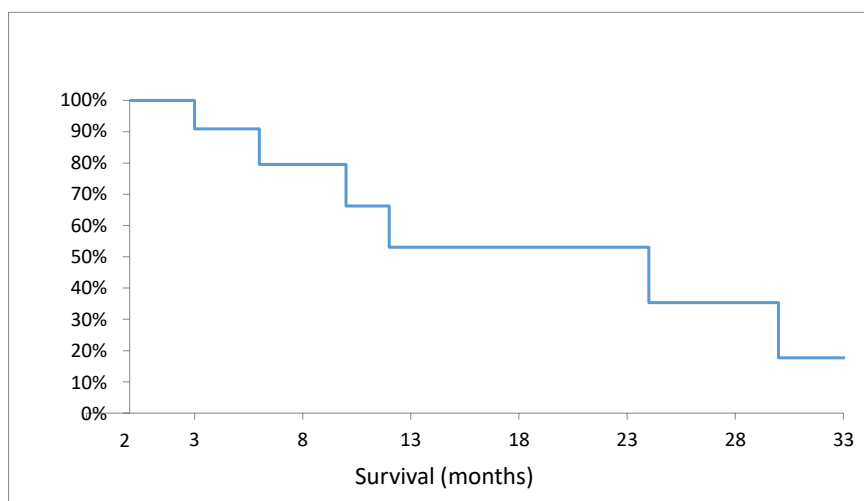


Figure 2. Kaplan Meyer curve showing the overall survival of the patients.

4. Discussion

In 5 years 35 radical nephrectomies for kidney cancer had been performed. This low incidence was found in the series of Ndoye M. [5] in Senegal and Badmus A [7] in Nigeria who had reported respectively 31 in 12 years and 18 cases in 10 years. However, Bellec L [8] in France had performed 274 radical nephrectomies in 4 years. These low incidences in our African countries are thought to be due to the non-practice of routine health check-ups, in the absence of clinical signs and the low level of education of our populations. In these countries tumors are more often found at an advanced stage, usually inoperable [9].

All of our patients had been operated by open surgery. This route was the only one described in the series by Ndoye M *et al.* [5] in Senegal, Avakoudjo DGJ *et al.* [10] in Benin and Badmus A *et al.* [7] in Nigeria. However, the laparoscopic route is currently the most widely used in developed countries. This is the case of James F.B *et al.* [11] in the USA, Hemal AK *et al.* [12] in India who asserted that the laparoscopic route is the gold standard for radical nephrectomies. Indeed, laparoscopic routes allow a reduction in intraoperative blood loss, rapid resumption of activities and fewer complications. Studies have shown that after surgery with laparoscopic radical nephrectomy, the operation time, intraoperative blood loss, hospital stay were better than open surgery [13].

With the continuous development of laparoscopic technology, the application range of laparoscopic radical nephrectomy is expanding. For large size renal tumor, technical problems have also been raised for the application of laparoscopic radical nephrectomy (LRN) An increase in tumor volume will reduce the space for surgery. The possibility of cancer rupture and the possibility of surgery to cause tumors to invade other organs are enhanced [14]. For these reasons, open radical nephrectomy is a technical challenge for larger tumor treatments. In theory, the treatment of larger tumors is a more sensible choice. There should be a clear range for the size of the tumor to which the LRN is applied. Dunn *et al.* reported that LRN can be selected for tumor size range <10 cm [15], Hemal *et al.*

reported a tumor size range of 7 to 10 cm [12]. Zhao even advocates the LRN in cytoreductive nephrectomy [16]. However, the extent of tumor size is not a factor in determining LRN use. Advances in laparoscopic techniques and increasing surgeon experience have helped to improve the adverse effects of LRN on larger kidney cancers.

The overall survival rate was 35.4% at 24 months, lower than that of HEMAL AK *et al.* and Polo G *et al.* [17] who had respectively 88.7% at 5 years and 82% at 60 months. The low survival rate observed in our patients could be explained by the large size of the tumors, the high ISUP nucleolar grade, which are factors of poor prognosis after radical nephrectomy [18].

5. Conclusion

Radical nephrectomy is a procedure that is not commonly performed in our institution because kidney tumors were most often found at an advanced stage. When realized, it was open radical nephrectomy for large size tumor or open cyto-reductive nephrectomy for metastatic renal carcinoma. Even though the oncological results are comparable to laparoscopic surgery, it should not be forgotten that the laparoscopic radical nephrectomy reduces morbidity. It will then be necessary to adapt to gold standard practices by acquiring the appropriate technical equipment.

Authors' Contribution

KT, EVS, and KHS were responsible for the conceptual design. Analysis, drafting, and critical revision of the article were performed by KT, EVS, GB. K T, EVS, EP and MTK were responsible for the final approval of the article.

Conflicts of Interest

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

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