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ADULT NEPHRECTOMY: OUR EXPERIENCE AT ILE-IFE

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ABSTRACT

Objectives: To determine indications for adult nephrectomy in our community and the outcome of the procedure in our Institution.

Materials and Method: Records of adult patients scheduled for nephrectomy at Obafemi Awolowo University Teaching Hospital from January 1993 to December 2004 were reviewed. Information extracted and analysed included age of patient, sex, presentation, investigations, indication, type and outcome of nephrectomy, histopathology result and duration of follow up.

Results: During the period, thirty adult patients mean age 42.73yrs (range 16-80yrs, M: F=2:1) were scheduled for nephrectomy. Indications included suspicion of malignancy in 19(63.3%) patients, protracted loin pain in non-functioning kidney in 2(6.7%), uncontrollable bleeding in a patient with bilateral polycystic kidney (3.3%), pyonephrosis with septicaemia in a patient (3.3%), kidney injury (grade 5) in 2(6.7%) and kidney donation for transplantation in 3(10%). Ultrasound and intravenous urography were useful in the patients' evaluation. Twenty-seven (90%) patients were operated upon, but only 25(83.3%) had nephrectomy. Sixteen (53.3%) had radical nephrectomy, 5(16.7%) had simple nephrectomy, 3(10%) had nephro-ureterectomy, and one (3.3%) had partial nephrectomy. Major surgical complications included wound sepsis (18.5%) and primary haemorrhage (7.4%). The overall morbidity and mortality rates were 7.4% and 3.7% respectively. Post-uninephrectomy, patients' renal function remained stable after an average of 34.05months follow-up.

Conclusion: Renal tumours constitute the main indication for adult nephrectomy in our community. Kidney injury, kidney donation, and pyonephrosis are relatively uncommon indications. Open nephrectomy, which remains our local practice, is safe and unilateral nephrectomy is compatible with normal life.

Key Words: Nephrectomy, renal tumours, loin pain, haematuria, kidney injury and kidney donation.

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INTRODUCTION

The first planned nephrectomy was performed by Gustav Simon to treat uretero-vaginal fistula in 1869 [1-3]. Twelve years later (1881), Henry Morris applied the term "nephrectomy" to removal of the kidney [4]. In 1887, Vincenz Czerny performed the first partial nephrectomy to treat renal tumour [5]. Since then, different indications and type of nephrectomy have been defined and various surgical techniques have also evolved.In the pre-antibiotic era, nephrectomy was associated with high incidence of peritonitis and other abdominal complications. With the advent of potent antibiotics, the danger posed by sepsis has been drastically reduced, but nephrectomy is still associated with major complications [6-8]. Following radical nephrectomy, postoperative complications are still as high as 20.0%, with a mortality rate of about 2.0% [9].The zeal for safer technique and better result gave birth to the current era of minimally invasive laparoscopic nephrectomy introduced in 1991 by Clayman [10]. This technique has been applied in simple as well as in radical nephrectomy for benign and malignant renal diseases [11-14], and recently in harvesting kidney for transplantation [15]. While this procedure is being perfected with good results reported in many centers [11, 12, 14, 16], in most developing countries like ours; nephrectomy is still solely performed by the open surgical technique.With the current advances in this procedure, we are challenged to assess our local practice with respect to adult nephrectomy. This study was carried out in a Nigerian teaching hospital, which sub-serves the health needs of the urban and semi urban population in southwestern Nigeria. It was undertaken to determine the various indications for nephrectomy in our adult population, the type of operation and the outcome of the procedures in our health Institution

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OBJECTIVES

This study is aimed at determining the indications for adult nephrectomy in our immediate environment and the outcome of the surgical procedure in our health institution, and to compare our results with findings elsewhere.

MATERIALS AND METHOD

The hospital records of adult patients scheduled for nephrectomy from January 1993 to December 2004 were reviewed. Information extracted and analysed includes the age of patients, sex, presentation, investigations, indication for surgery, surgical procedure, histopathology result of organ/tumour specimens removed at surgery and at autopsy, outcome of surgery and the duration of follow up.

RESULTS

During the period, thirty adult patients with mean age 42.73yrs (range 16-80yrs, M: F=2:1) were scheduled for nephrectomy. The indications for nephrectomy and tissue diagnosis, surgical procedures and complications of surgery were as listed in Tables 1-3. Twenty-five (83.3%) patients t had renal tumours of which 19(63.3%) were malignant (mean age 48.3yrs, range 16-80yrs), and 6(20.0%) were benign (mean age 32.5yrs, range 20-47yrs). Presentation in patients with malignancy included protracted loin pain 18(94.7%), abdominal mass 16(84.2%), weight loss 14(73.7%), haematuria 10(52.6%), fever 2(10.5%) and generalised body weakness 3(15.8%). All the six patients with benign tumours also had loin pain with abdominal mass, and half of them also had haematuria and weight loss. In 90.0% of cases, the neoplastic kidneys showed no excretion on intravenous urography. Two patients had renal injury from knife stab and gun shorespectively. Both presented with haematuria, pain, and massive bleeding from the wound site. Patients with pyonephrosis had abdominal swelling and pain, fever, weight loss and anaemia. The three kidney donors (11.1%) were normal patients. Nephrectomy was successfully carried out in 25(83.3%) of the 30 patients. Postoperatively, patients with malignancy were scheduled for radiotherapy and all the patients were followed up with serial abdominal ultrasound and renal function test to detect tumour recurrence and to monitor the remaining kidney.

Table 1**: Indications for Nephrectomy**

DIAGNOSIS	SUB-TYPE	NO OF PATIENTS (%)
Malignant Renal tumours 19 (63.3%)	Renal cell carcinoma	14 (46.7%)
	Transitional cell carcinoma	2 (6.7%)
	Malignant fibrous histiocytic tumour	1 (3.3%)
	Squamous cell carcinoma	1 (3.3%)
	Metastatic adenocarcinoma	1 (3.3%)
	Sub-total	**19 (63.3%)**
Benign Renal tumours 6(20%)	Chronic non-specific Oncocytoma	1 (3.3%)
	Simple renal cyst	1 (3.3%)
	Hydronephrosis	1 (3.3%)
	Developing congenital renal cyst	1 (3.3%)
	Polycystic kidney in end stage renal disease	1 (3.3%)
	Infected simple renal cyst	1 (3.3%)
	Sub-total	**6 (20.0%)**
Renal Trauma 2 (6.7%)	Severe contusion with pedicle injury (Grade 5)	2 (6.6%)
Donor Nephrectomy 3 (10%)	-	3 (10%)
Grand-Total		**30 (100%)**

Table 2: **Type of Nephrectomy**

Operation	Indications	Number of patients	Average Duration of hospital stay (days)
Radical Nephrectomy	Tumours suspected to be malignant	16 (53.3%)	9.5 (Range 6-17)
Simple Nephrectomy	Benign tumours (3) Injured kidneys (2)	5 (16.7%)	17.2 (Range 7 42)
Partial Nephrectomy	Pyonephrosis	1 (3.3%)	13
Nephro-ureterectomy	Organs for transplantation	3 (10%)	8.6 (Range 6-14)

Table 3: **Complications of Surgery**

Complications	No of Patients(%)
Wound sepsis	5(18.5%)
Primary haemorrhage	2 (7.4%)
Anxiety state	2 (7.4%)
Septicaemia + Lobar pneumonia	1 (3.7%)
Cystitis	1 (3.7%)
Duodeno-cutaneous fistula	1(3.7%)
Peroneal nerve palsy	1(3.7%)
Fat necrosis	1(3.7%)
Intraperitoneal abscess + pancreatic pseudocyst + Burst abdomen	1(3.7%)
Hypertrophic scar	1(3.7%)
Pulmonary embolism	1(3.7%)
Tumour recurrence	1(3.7%)

Surgical Procedures and Outcome

Twenty-seven patients were operated upon under inhalational general anaesthesia. Radical nephrectomy was carried out on 16 (53.3%) cases suspected to be malignant (later confirmed as 14 malignant and 2 benign tumours), simple nephrectomy in 5(16.7%) patients, which included 2 patients with injured kidneys and 3 with benign tumours. One patient with infected renal cyst (pyonephrosis) had partial nephrectomy, while the three living donors for renal transplantation had left nephro-ureterectomy (table 2). Only exploratory laparotomy was possible in two patients due to fixity of the tumours. One patient with secondary renal tumour with the primary in the colon had descending colectomy along with the radical left nephrectomy. Intra-operative blood loss was_low (= 0.2L) in simple nephrectomy for small benign lesions and high (= 1.7L) in radical nephrectomy for big malignant tumours. Apart from minor complications listed in table 3, the overall morbidity and mortality rates were 7.4% and 3.7% respectively. The average duration of hospital stay and follow up were 11.2 days (range 642 days) and 34.05months respectively.

DISCUSSION

This review shows that in our adult population, nephrectomy is more commonly performed on males (M: F=2:1) aged 16-80yrs. The small number of adult patients scheduled for nephrectomy over the twelve-year period indicates that nephrectomy is not a common procedure in adults in this community. Comparable number of patients had nephrectomy over a ten-year period at the University of Port-Harcourt Teaching hospital[18].

This review also shows that renal tumours which accounted for 25(83.3%) of the cases, constitute the main indications for adult nephrectomy in our community. Other indications include injury to the kidney, pyonephrosis and kidney donations for transplantation into patients with end stage renal disease (ESRD). Two cases of renal injuries and a case of pyonephrosis managed over the 12-year period indicate that trauma and infective conditions are uncommon indications for adult nephrectomy in our society [18]. With the observation that kidney transplantation for treating ESRD has just commenced locally, kidney donation (12.0% in this series) may become an important indication for adult nephrectomy in this community if our people show positive attitude toward donation.Loin pain observed in 18(94.7%), abdominal mass in 16(84.2%), and haematuria in 10(52.6%), were common presentations in patients with malignant renal tumour in this review just as earlier reports in literature [17-20]. Fourteen (73.7%) of them also lost weight possibly due to late presentation. All the patients with benign renal tumours had loin pain with abdominal mass, while half of them also had haematuria. The presence of these symptoms regarded as "too late triads of renal malignancy" in patients with benign tumours indicates that benign renal tumours can clinically be misdiagnosed as malignant tumours. Similarly, haematuria and abdominal pain were also prominent symptoms in patients with penetrating renal injury besides life threatening bleeding. The shattered kidney and renal pedicle involvement in both cases respectively accounted for the massive bleeding.

Based on the clinical, ultrasound and the intravenous urographic features, the benign and malignant renal tumours were accurately diagnosed except in two patients where benign tumours were preoperatively misdiagnosed as malignant tumours. Beside its non-invasiveness, ultrasound accurately localized the tumours and depicted diagnostic features in these patients thereby negating the need for invasive procedures for making diagnosis [21].

Although malignancy was suspected in 21(70.0%) patients, histopathology confirmed same in 19(63.3%). The two patients preoperatively misdiagnosed as having malignant lesions were among the 16 that had radical nephrectomy. Histopathology later confirmed chronic non-specific oncocytoma and simple renal cyst in these two patients. This finding illustrates some of the preoperative difficulties in differentiating benign from malignant renal tumours. Renal cell carcinoma (RCC) of various cell types which accounted for 14(73.7%) of the 19 malignant tumours indicates that RCC is the commonest histopathological type. Benign tumours, confirmed in 6(20.0%) patients were mainly cystic tumours. One of them had simple renal cyst that became infected and presented with pyonephrosis, perinephric abscess and septicaemia.

Nephrectomy was successfully carried out in 25 (92.6%) of 27 patients operated upon. In two patients, tumours were not resectable due to fixity to the surroundings structures and the great vessels. All the operations were performed by the open surgical technique because the laparoscopic method, the current trend, has not been commenced locally due to lack of necessary facilities and expertise [11-15].

Although partial nephrectomy is indicated in selected patients with localized non-malignant kidney pathology [22], loss of function established preoperatively negates the need for partial resection in most of our patients with benign tumours. Associated vascular injury with late presentation in the two patients with renal injury also precluded partial nephrectomy. Only one patient with localized infected renal cyst had partial nephrectomy. The patient with bilateral polycystic kidneys was in ESRD and was well maintained on regular haemodialysis and erythropoietin until he developed uncontrollable bleeding in the right kidney. He had 5 units of fresh blood transfused to no avail before the affected right kidney was removed.

One obese patient with malignancy died from pulmonary embolism four hours after surgery while 9(33.3%) patients had one or more surgical complications. Wound sepsis, observed in 5 (18.5%) patients was the most common complication.

The high wound sepsis rate was due to the fact that in three patients, the wounds were 'surgically dirty wounds' (i.e. the pyonephrosis and the two penetrating renal injuries). The intra-operative blood loss was observed to be influenced by the underlying pathology, the type of surgery and the size of the tumour, due to extensive neo-vascularisation. Although most of our patients were discharged home within a week after surgery, the overall mean duration of hospital stay was 11.2 days due to prolonged hospitalization in two patients with severe morbidity.

Morbidity involved a case of oncocytoma and a stab kidney injury. Both patients had severe anaemia on presentation and were resuscitated with four units of blood each before surgery. The patient with oncocytoma had wound sepsis with duodeno-cutaneous fistula, a known complication of nephrectomy [8]. The fistula started leaking on postoperative day 3 and closed 2 weeks later with conservative management. The patient with stab injury presented with infected loin wound two days after injury. Beside the wound sepsis, he also had septicaemia, peritonitis with intra-peritoneal abscess, burst abdomen and lobar pneumonia. He was re-explored to drain the abscess. Both were discharged home 42 days after surgery.

Following scanty reports of glomerulopathy and renal failure developing as late as 22 years post-nephrectomy [23, 24], all our patients have been advised on moderate protein intake to reduce this risk [25]. They are also being followed up jointly with nephrologists with regular clinical evaluation, quarterly electrolytes, urea and creatinine measurement with ultrasound scanning for early detection of renal insufficiency or tumour recurrence.

Out of the 14 confirmed malignant cases operated upon, 6(42.8%) patients were stable until they were lost to follow up after an average duration of 13.03 months, two died after 5.3 and 50 months of follow up, while the remaining 6 (42.8%) patients that are still of follow up have remained stable after an average duration of 49.2 (range 5-78) months. The two trauma cases were also stable till they were lost to follow up after 18 and 24 months respectively, while all the living donors and those operated upon for benign tumours (except the patient with bilateral polycystic kidney who died from ESRD 2months after surgery) have remained stable after an average duration of 43.7 and 56.7 months respectively. Throughout the period of follow up, the patients remained in healthy conditions with normal renal function; lending credence to the fact that one kidney is sufficient for normal life [26-29].

CONCLUSION

Kidney tumours (mostly malignant) constitute the main indication for adult nephrectomy in our immediate environment. Kidney injury, pyonephrosis and kidney donation are relatively uncommon indications. Open nephrectomy, which remains our local surgical technique, is safe and unilateral nephrectomy is compatible with normal life.

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