ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 07 | July - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISON OF INTRAOPERATIVE PARAMETERS AND POST OPERATIVE COMPLICATIONS IN NEPHRECTOMY FOR BENIGN NON-FUNCTIONAL KIDNEY AND EARLY RENAL MALIGNANCY.

Biochemistry

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ABSTRACT

The main aim of this study was to compare the outcome following open and transperitoneal laparoscopic nephrectomy at a single centre. In this study we compared and studied the effectiveness of Laparoscopic nephrectomy versus open nephrectomy methods in the diagnosed patients of benign non functional kidney and early stage renal cell carcinoma. A total number of 80 patients participated for the purpose of this study. Out of total 40 patients were scheduled for laparoscopic nephrectomy and 40 were operated through open route for better comparison. The comparison was made in relation to operative time, intra operative and post operative complications, blood loss and blood transfusion. Blood loss was more in the open group than the laparoscopic group. Patients in the laparoscopic group had better recovery rates and resumed earlier to oral intake. They also had earlier removal of drains, less post operative pain and early ambulation. Intraoperative complications were more commonly seen in the laparoscopic group while as blood transfusions were required in open group mostly. The mean operative time was significantly lesser in open group than the laparoscopic. In this study a total of 2 patients (5%) had major intra-operative complications and these occurred in the laparoscopic nephrectomy group. Overall the intraoperative complications in this study were lesser as compared to the literature and may be attributed to careful patient selection, procedure selection and also to the experience of the operating surgeons. The post operative complications were mostly wound related and were expectedly more in the open nephrectomy group.

KEYWORDS

Laparoscopic nephrectomy, open nephrectomy methods, benign non functional kidney, renal cell carcinoma.

INTRODUCTION:

Laparoscopic nephrectomy has replaced open nephrectomy as a treatment of choice for many benign and malignant diseases with excellent results. Laparoscopic nephrectomy is indicated in the treatment of most benign renal diseases in which permanent loss of renal function has occurred. In malignant cancers such as renal cell carcinoma surgery is the mainstay of treatment. As per literature, Radical or partial nephrectomy before and or after the radiation therapy is indicated in renal cell carcinoma. Various other diseases in which it is indicated include chronic pyelonephritis, calculus disease, obstructive or reflux nephropathy, renal tuberculosis etc. Laparoscopic urology has rapidly evolved since the mid 1990s through advances in video technology and instrumentation design. Clayman et al.[1] performed the first laparoscopic nephrectomy for a 3 cm renal mass in an elderly patient in June 1990 and since the first clinical report in 1991, laparoscopic nephrectomy has been embraced by urologists worldwide. There are various types of nephrectomy i.e. partial, simple and radical nephrectomy and choice depends on the degree of renal impairment and other associated co-morbidities. Time utilized for laparoscopic procedures is more as compared to open surgery.[2,3,4,5] However, there are considerable reductions in terms of morbidity and time taken to resume normal activities as well as to full recovery in these laparoscopic procedures.[6] Major complications are relatively common in early operations but with more advanced experience morbidity has been reduced.[6,7,8] In this study we compiled various intraoperative parameters so as to compare and evaluate the usefulness of open and laparoscopic procedures in case of benign renal diseases and malignancies. Post operative complications like wound healing; pneumonia, haematoma etc. were also compiled and statistically differentiated between open and laparoscopic groups of patients. Laparoscopic nephrectomy for the malignant renal disease is controversial as per many studies due to spillage of malignant tissue in the abdominal cavity during the surgical procedures.[8, 9, 10, 11] With the advent of abdominal CT scans and ultrasound imaging it has become relatively easier to diagnose malignant kidney diseases e.g. renal cell carcinoma at relatively earlier stages or by incidental diagnosis in asymptomatic patients. This may help in better survival, less recurrence and lower metastasis rates than RCC detected in symptomatic cases. Laparoscopic nephrectomy has become the preferred choice for early stage renal cancers.[8]

MATERIALS AND METHODS:

The present study was a prospective study, conducted in the Department of Urology (Surgery), Batra Hospital and Medical Research Centre, New Delhi. A total number of 80 patients were selected for the purpose of this study. A written informed consent was taken from all patients that participated for the purpose of this study. Out of these 40 patients underwent laparoscopic nephrectomy and 40 were operated through open route.The comparison was made in relation to operative time, intra operative and post operative complications, blood loss and transfusions.

Statistical analysis of the data:

Data was collected and managed using Microsoft Excel. Unpaired students t-test was used to determine the significance between two independent groups among continuous variables. For qualitative data chi square test was used to see the significant difference in proportion between two groups. A p value of <0.05 was considered as significant.

RESULTS:

Table 1: Comparison of intraoperative parameters between open and laparoscopic groups

		Open	Laparo	p value
Operative time	Mean	90 ±29.40	125.25 ±36.94	0.0038
	Range	50-140	70-190	
Blood loss (ml)	Mean	327 ± 118.78	104.25 ± 66.62	0.0001
	Range	150-600	40-350	
Oral intake (hrs)	Mean	33.6 ± 14.87	30.3 ± 13.3	0.2987
	Range	24-72	12-72	
Drain removal (days)	Mean	2.6 ± 0.68	1.55 ± 0.57	0.0786
	Range	2-3	1-2	
Intra operative complications	Major	2 (5%)	1 (2.5%)	
	Minor	2 (5%)	1 (2.5%)	
Blood transfusions		14 (35%)	8 (20%)	

The mean operative time was significantly less in open group than the laparoscopic (90 min and 125.25 min respectively). Blood loss was more in the open group than the laparoscopic group (327ml vs. 104.25 ml respectively). Intraoperative complications were more common in the laparoscopic group while as blood transfusions were more commonly required in open group. Patients in the laparoscopic group had early resumption of oral intake and an earlier removal of drains although the difference was not statistically significant.

Table 2: Post operative complications

	Open n=40	Lap (n=40)
Sup. Wound infection	4	1
Hematoma/ collection	1	1
Fever	0	0
Prolonged ileus	1	0
Pneumonia/atelactasis	0	0
Flank pain/hernia	1	0
Total	7 (17%)	2 (5%)

In this study a total of 2 patients (5%) had major intra-operative complications and these occurred in the lap nephrectomy group. Both these patients had history of previous surgeries done. In one of the patients there was profuse bleeding while breaking dense perinephric adhesions and while as in another patient a rent occurred in the diaphragm while dissecting the upper part of kidney with "Harmonic ace". Both these complications manifested difficulty in approaching adhesions through laparoscopic route. There was one (2.5%) major complication in the open route. A patient of calculus kidney disease with non functioning kidney had a pleural injury while access and was primarily closed. A total of 2% of the patients had to be converted to open and were the same two patients who had complications due to perinephric adhesions and diaphragmatic injury respectively. Overall the intraoperative complications in our study were lesser as compared to the literature and may be attributed to careful patient selection, procedure selection and also to the experience of the operating surgeons. The post operative complications were mostly wound related and were expectedly more in the open group.

DISCUSSION:

Laparoscopic surgery has made tremendous advances in the recent years. Earlier reports of laparoscopic nephrectomy showed the advantages of less post operative pain and quicker recovery. Gill et al. (1995) reported that the average operative time was more in laparoscopic route than the open route but the patients had a shorter hospital stay, less post operative complications and early resumption of orals. With the gain in experience and modification of techniques operative times have been significantly reduced and are comparable with open surgery. Keely and Tolly (1998), Fornara et al. (2001-2003) and many more recent studies have revealed less operative time comparable with that of the open surgery. In the present study 80 patients participated. Out of them 40 were in open group and 40 were in laparoscopic group. More females were present in the laparoscopic group and more males in the open group. Most common age group was 21-40 years in the laparoscopic group and 41-60 in the open group. In this study mean operative time for laparoscopic group was 125.25 minutes which was significantly longer than the open group having 90 minutes and correlated with the suggested literature. In laparoscopic nephrectomy the blood loss was significantly less compared to open group which correlates with the literature. Laparoscopic nephrectomy group had a mean blood loss of (104.25 ml) compared to (327ml) in open nephrectomy group. This is an important consideration as most of the female patients in our study were anaemic.

CONCLUSION:

Overall the intraoperative complications in our study were lesser as compared to the literature and may be attributed to careful patient selection, procedure selection and also to the experience of the operating surgeons. The post operative complications were mostly wound related and were expectedly more in the open group. Operative time and cost was more in laparoscopic procedure but overall benefits were more in laparoscopic than the open group. Blood loss was also more in open group. Therefore, laparoscopic procedures are preferable surgical procedures.

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