THE ROLE OF SURGICAL PATIENT ENHANCEMENT TEAM (SPET) IN POST OPERATIVE RECOVERY OF PATIENTS WHO UNDERWENT LAPAROSCOPIC RADICAL NEPHRECTOMY THROUGH TRANS-PERITONEAL VERSUS RETROPERITONEAL ACCESS

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ABSTRACT

Objective: To evaluate the impact of surgical patient enhancement team (SPET) in post-operative recovery of patients who had laparoscopic radical nephrectomy through Trans-peritoneal versus retroperitoneal access.
Study Design: Quasi experimental study.
Place and Duration of Study: Medway NHS Trust Hospital for renal masses, United Kingdom, from Aug 2013 and Oct 2014.
Methodology: During our study duration ninety patients underwent Laparoscopic Radical nephrectomy at Medway NHS Trust Hospital for renal masses. Fifty three patients had Laparoscopic Trans-peritoneal Nephrectomy (LTN) and 23 had Laparoscopic Retroperitoneal nephrectomy (LRN). Demographic and clinico-pathological parameters were compared for the two groups.
Results: The two groups were comparable for age, gender, pre and post-operative blood parameters, length of hospital stay and post-operative complication. The analgesia requirement was statistically significant for Laparoscopic Trans-peritoneal nephrectomy group with high pain score however with the involvement of surgical patient enhancement team the patients were safely discharged home on a comparable date to Laparoscopic Retroperitoneal nephrectomy group.
Conclusion: The two approaches are comparable and with the added support of surgical patient enhancement team, the patients with Trans-peritoneal radical nephrectomy could be safely and efficiently discharged.

Keywords: Laparoscopic, Post-operative recovery, Renal cell carcinoma, Radical nephrectomy.

INTRODUCTION

Renal cell carcinoma (RCC) is an important surgical predicament in urology. It is the most common solid renal tumour and is approximately 90% of all renal cancers. It has an incidence rate of 2-3%, making it the 8th commonest cancer. Western countries represent the highest incidence rates[1]. According to the data published by the cancer research UK, there were 12,523 new cases of kidney cancer in the UK reported in 2014: 7,839 (63%) in males and 4,684 (37%). In the era of ultrasonography and computer tomography, there have been increased detection rates, leading to a higher rate of incidental diagnosis and a lower stage of disease[2]. As most renal cancers are incidental tumors, their size is much smaller at diagnosis, and identified after imaging done for other reasons[3]. The average size of renal tumors has decreased from 67 mm to 59 mm between 1988 to 2002 according to the Surveillance Epidemiology and End Results (SEER) database[4].

Radical nephrectomy is the curative treatment of choice for RCC. Laparoscopic radical nephrectomy is now considered the gold standard for up to a T2 stage disease as per European Association of Urology Guidelines, in patients who cannot be treated with nephronsparing surgery[1].

Laparoscopic surgery can be performed through Trans-peritoneal or Retroperitoneal

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access. There is ongoing debate on the safety and efficacy of each approach. Most studies found the two approaches comparable[5,6], however for posterior masses retroperitoneal approach can prove to be superior. The results from the meta-analysis showed that laparoscopic radical nephrectomy had a quicker time to vascular control, shorter operating time, and overall lower complication rates. Although outcome results were not different between the two approaches, this meta-analysis demonstrated that if the selection of patients is appropriate then retroperitoneal approach might be a better option[7].

The present study evaluates the outcome of patients who underwent laparoscopic retroperitoneal nephrectomy (LRN) versus laparoscopic trans-peritoneal nephrectomy (LTN) in an attempt to discern that the presence of a SPET team has an effect on variables that were deemed comparable in other studies.

The Surgical Patient Enhancement Team (SPET) is a seven-day service offered by a team of staff including an experienced physiotherapist, a part-time occupational therapist, an enhanced recovery program clinical nurse, and an emergency pathway coordinator that manage post-operative patients in the community. Their role facilitates a speedier discharge from hospital after surgery and to enable patients access to medical attention in the community. Nurses visit patients based on post-operative need and monitoring. For instance, daily drain output is monitored; surgical wounds are checked and re-dressed; drains are removed; clinical post-operative status is monitored. If there are concerns, nurses have access to medical professionals to seek advice and may refer patients back to hospital for a medical review if necessary. Any patients within a specific catchment area have SPET available; those outside the boundaries do not receive any support in the community apart from district nurses and general practitioners.

METHODOLOGY

This was a quasi experimental study comparing the outcome of the patients who underwent Laparoscopic nephrectomy for treatment of Renal mass between August 2013 and October 2014. These patients were identified through the hospital database by using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9CM). Patients with incomplete clinical notes at time of data collection, those who required intensive care post operatively or who had conversion to open nephrectomy were excluded.

Renal cancer was diagnosed on imaging (CT Scan with contrast or MRI) while renal biopsy was done for indeterminate lesions. The preoperative staging work-up included CT Chest, Full blood count, U&Es and LFTs. The tumors were staged according to TNM 2009 classification. The patients underwent either trans-peritoneal or retro-peritoneal laparoscopic nephrectomy depending on the preferred approach by the operating surgeon. Post operative pain control was achieved with Patient controlled intermittent analgesia (PCIA), morphine and oral analgesia. The pain score was recorded using 11 point Numeric pain intensity scale, each post-operative day starting from first post-operative day to the day of discharge.

All patients have post-operative blood checked for Full blood count (FBC) and Renal functions (Serum creatinine, estimated glomerular filtration rate and electrolytes). Patients were subsequently discharge home once clinically stable. SPET team reviewed the patients on regular intervals. First post-operative visit in clinic was after multidisciplinary team (MDT) meeting discussion followed by routine follow up based on histopathology.

Statistical analysis was performed using SPSS version 19. The variables evaluated were age, gender, retro-peritoneal Vs. trans-peritoneal, Pre and post operative FBC and U & Es, post op complication rate, pain scores, analgesia requirement, length of stay, involvement of SPET Team and final histology. The chi-square test and independent sample t-test were used for statistical analysis. The association of SPET team

involvement with categorical variables was assessed by using the Fisher exact test or the chi-square test, while the Mann-Whitney U test was used for continuous variables. Results were presented as mean ± standard deviation for quantitative variables and as number (%) of patients for qualitative variables.

RESULTS

A total of 90 patients underwent Laparoscopic Radical Nephrectomy during the study period. Eight patients had incomplete clinical notes at time of data collection, three patients required intensive care post operatively while three patients had conversion to open nephrectomy. Our final study population consisted of 76 patients.

The mean age of the study population was 67.2 ± 11.3 (range: 37-88) and of them majority were male 48 (63.2%). The median length of stay was 2.8 days. Fifty three patients (69.74%) underwent radical nephrectomy through Trans-peritoneal access while 23 patients (30.26%) had retro-peritoneal access. The demographic and clinico-pathological details are shown in table-I.

There was no statistically significant difference between two groups in terms of age, gender, performance status, co-morbidities, length of stay and various clinical parameter as shown in table-II. There was statistically significant difference in terms of analgesia requirement, as patient in Trans-peritoneal group were likely to use PCA more than Retro-peritoneal group (p=0.000).

There was no statistically significant difference between the two groups in terms of mean pain score on first post-operative day and day of discharge however the data suggest that the patients who had trans-peritoneal procedure had high analgesia requirement for pain control. The SPET team was involved in care of 50 patients and all of these were from Trans-peritoneal group (p<0.001). Despite high analgesia requirement the re-admission rate was similar in both groups (p=0.58). The overall complication rate was similar in each group however one patient in Trans-peritoneal group had Clavien grade III complication requiring drainage of collection under local anesthesia. There was no 90 day Peri-

Table-I: Clinico-pathological variables of all patients.

Variables	(n=76)
Age (mean ± SD)	67.2 ± 11.3 (range: 37-88)
Gender	Male: 48 (63.2%) Female: 28 (36.8%)
American Society of Anesthesiologists	I: 14 (18.4%) II: 49 (64.5%) III: 13 (17.1%)
WHO Performance status	0: 33 (43.4%) I: 38 (50%) II: 5 (6.6%)
Length of Stay (median)	2.8 days
Pre Operative Hemoglobin (mean ± SD)	139.13 ± 16.15
Pre Operative Creatinine (mean ± SD)	88.6 ± 22.9
Pre Operative eGFR (mean ± SD)	73.1 ± 15.99
Access	Trans-peritoneal: 53(69.74%) Retro-peritoneal: 3 (30.26%)
Pain score (mean ± SD)	1.94 ± 1.6
Analgesia	Diamorphine: 53 (69.7%) Local anesthetic infiltration: 3 (3.9%) PCA: 20 (26.3%)
Pain Score 1st Post Op Day (mean ± SD)	2.98 ± 1.9
Pain score on discharge Day (mean ± SD)	1.1 ± 1.0
Tumor Subtype	RCC: 53 (69.74%) Upper tract TCC: 10 (13.16%) Benign: 13 (17.10%)
Tumor Grade	
Morbidity (Modified Clavien grade)	I: 07 (9.21%) II: 01 (1.32%) III: 01 (1.32%) No Morbidity: 67 (88.15%)
Post Operative Hemoglobin (mean ± SD)	118.44 ± 16.33
Post Operative Creatinine (mean ± SD)	97.54 ± 26.6
Post Operative eGFR (mean ± SD)	57.34 ± 18.4
Surgical Patient Enhancement Team	Yes: 50 (65.8%) No: 26 (34.2%)

operative mortality.

DISCUSSION

Radical nephrectomy is considered as standard in the management of Renal cancer. Historically it has been performed through an open approach using a flank incision however Minimally invasive surgery has developed rapidly in the last two decades. With the help of newer entities like Laparoscopic and Robotic approaches, radical nephrectomy through MIS is now perceived as the gold standard and is taking over from open radical nephrectomy[8] however the oncological outcome is similar for all three approaches based on the available literature[7,9-11].

Laparoscopic approach for Radical nephrectomy was first described by Clayman *et al* in 1991[12]. This can be performed through transperitoneal or retroperitoneal access[13]. The choice of access is usually based on surgeons' experience and choice. Trans-peritoneal approach is by and large preferred in patients with history of retroperitoneal surgery and in patients with large

Table-II: Comparison of clinico-pathological details of transperitoneal and retroperitoneal group.

Variables	Transperitoneal (n=53)	Retroperitoneal (n=23)	*p*-value
Age (mean ± SD)	66.26 ± 11.26 (Range: 37-88)	67.17 ± 11.21 (Range: 38-86)	0.633
Gender			
Male Female	34 (64.15%) 19 (35.85%)	14 (60.87%) 09 (39.13%)	0.801
ASA			
I II III	I: 11(20.75%) II: 35 (66.05%) III: 07(13.20%)	I: 03 (13.05%) II: 14 (60.87%) III: 6 (26.08%)	0.365
WHO Performance status	0: 26 (49.05%) I: 24 (45.28%) II: 03 (5.67%)	0: 07 (30.44%) I: 14 (60.86%) II: 02 (8.7%)	0.285
Length of Stay (median)	2.6 ± 1.86	3.0 ± 1.5	0.633
Pre Operative Hemoglobin (mean ± SD)	132.13 ± 17.13	134.13 ± 14.20	0.173
Pre Operative Creatinine (mean ± SD)	86.2 ± 23.5	87.6 ± 22.9	0.28
Pre Operative eGFR (mean ± SD)	72.3 ± 14.79	73.3 ± 13.89	0.783
Pain score (mean ± SD)	2.8 ± 1.4	1.93 ± 1.5	0.07
Analgesia	Diamorphine: 05 (9.44%) Local anesthetic infiltration: 01 (1.89%) PCA: 47 (88.67%)	Diamorphine: 06 (26.1%) Local anesthetic infiltration: 02 (8.7%) PCA: 15 (65.21%)	<0.001
Pain Score 1st Post Op Day (mean ± SD)	2.98 ± 1.9	2.98 ± 1.9	0.77
Pain Score on discharge Day (mean ± SD)	1.6 ± 1.2	1.0 ± 0.8	0.97
Tumor Subtype	RCC: 34(64.15%) Upper tract TCC: 06 (11.32%) Benign: 13 (24.53%)	RCC: 19 (82.6%) Upper tract TCC: 04 (17.4%) Benign: 0 (0%)	0.013
Morbidity (Modified Clavien grade)	I: 4 (7.54%) II: 1 (1.89%) III: 1 (1.89%) No Morbidity: 47(88.68%)	I: 3 (9.21%) II: 0 (0%) III: 0 (0%) No Morbidity: 20 (86.95%)	0.840
Post Operative Hemoglobin (mean ± SD)	118.44 ± 16.33	118.44 ± 16.33	0.11
Post Operative Creatinine (mean ± SD)	97.54 ± 26.6	97.54 ± 26.6	0.86
Post Operative eGFR (mean ± SD)	57.34 ± 18.4	57.34 ± 18.4	0.90
SPET Team	Yes: 50 (94.3%) No: 3 (5.66%)	Yes: 0 (0%) No: 23 (100%)	0.000
Readmission	02	01	0.58

tumours as this approach offer larger working space in comparison to retroperitoneal approach. On the other hand, retroperitoneal approach allows early access to the renal hilum and it is particularly useful for patients with prior intra-abdominal surgery. Many researchers have shared their experience with laparoscopic nephrectomy using trans-peritoneal and retroperitoneal approach[5,6,14,15]. In a randomized controlled trial, both approaches were found to be comparable in terms of estimated blood loss, hospital stay, intra-operative complications, post operative complications and post operative analgesia requirement[5]. Similar findings were noted in a comparative study by Okegawa *et al*[6]. In a meta-analysis Fan *et al* demonstrated similar findings however the retroperitoneal approach had lower complication rate and shorter hospital stay. In our study, the two groups had similar outcome in terms of intra operative and postoperative complications but the analgesia requirement was significantly higher in Trans-peritoneal group with high pain score on first post-operative day when compared to Retroperitoneal group however the later finding didn't reach statistical significance. We still managed to safely discharge these patients with similar hospital stay as Retroperitoneal group due to involvement of SPET team. This is demonstrated by only two readmissions in comparison to one in retroperitoneal group. The SPET team is linked to the hospital and is in direct contact with the consultant teams and quick access to bring patient back to hospital if need be. On the other hand the Retroperitoneal group patients were discharged with support provided by the GP or emergency services.

The idea of Multimodal rehabilitation programme which was later described as Enhanced recovery Programme was introduced by Basse *et al*[17] in year 2002 for patients who underwent Colonic resection. The authors noted significant improvement in peri-operative care and recovery of patients. This model was later introduced in urology with positive impact on post-operative recovery[18]. This is now considered as standard of care in many specialties[19-22]. Managed care pathways determine efficacy in improving the quality of perioperative care[19]. This programme is initiated from the preoperative assessments and continued till the time of discharge after surgery. Patients are provided with the emergency contact numbers for 24 hour advice and nurse specialist contact number. Taken few steps further, SPET has direct contact with the patient with regular visits that allow post-operative recovery assessment and opportunity to identify any clinical concern that needs to be addressed promptly. In our department, we have support of SPET for all major cases that allow early but safe discharges. To our knowledge, the role of SPET has not been evaluated in literature before and this is a first report on the outcome. However, the caveat associated with the study is smaller sample size. Unlike previous studies, we did not evaluate the oncological outcome as it is unrelated to the involvement of the SPET team. SPET support was available to the transperitoneal group only so there is a possibility that if SPET support will be available for Retroperitoneal group, it can further reduce the hospital stay. A study with larger sample size with multi-institutional involvement for various urological procedures is needed to confirm these findings.

CONCLUSION

Trans-peritoneal Radical nephrectomy is an equally safe procedure as Retroperitoneal radical nephrectomy and with the added support of the SPET, patients with Trans-peritoneal surgery could be safely and efficiently discharged at a comparable date if not earlier.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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