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Evaluation of Lateral Pelvic Lymph Nodes Involvement in Rectal Carcinoma

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ABSTRACT

Background: worldwide, colorectal cancer is the third most commonly occurring cancer in men and the second most commonly occurring cancer in women. There were over 1.8 million new cases in 2018.
Objective: evaluation of lateral pelvic lymph node involvement among patients with middle and low rectal carcinoma.
Patients and Methods: a descriptive prospective study was conducted at Surgical Unit of Oncology Bab Elshaarya University Hospital, Al Azhar University, during the period between November 2018 and July 2019 (a total period of 8 months), in which 20 patients of middle and low rectal carcinoma were identified.
Results: all patients had rectal adenocarcinoma; 17 patients (85%) with grade 2 and 3 patients (15%) with grade 3. Of the 20 identified patients, 15 patients (75%) had vascular invasion and 5 patients (25%) had no vascular invasion. Only 4 patients (20%) had positive lateral pelvic lymph nodes and 11 patients (55%) had positive mesorectal lymph nodes. All patients with positive lateral pelvic lymph nodes had also positive mesorectal lymph nodes.
Conclusion: total Mesorectal Excision (T.M.E.) is a standard operation for rectal carcinoma due to high incidence of mesorectal lymph node metastases. Transanal total mesorectal excision (TaTME) is a promising technique in rectal surgery especially in low rectal cancers. Most of patients had positive mesorectal lymph nodes and all patients with positive lateral pelvic lymph nodes also had positive mesorectal lymph nodes.
Keywords: Lateral lymph node, Rectal carcinoma, Total Mesorectal Excision.

INTRODUCTION

Patients with lower rectal cancer have an increased risk of lateral lymph node (LLN) metastasis because the lower rectum drains both upwards through the superior rectal vessels and laterally along the middle rectal vessels and then to the internal iliac vessels. The rates of LLN metastasis in rectal cancer have been reported to range from 8.6% to 29% [(1)].

Based on this, pelvic sidewall dissection has become a standard procedure for lower rectal cancer in Japan, although it is rarely performed in other countries. One reason that pelvic sidewall dissection is not performed in other countries may be because positive LLN would represent systemic spread rather than regional disease [(2)].

Gilchrist first described the lymphatic spread of rectal neoplasms in 1938, and the term 'lateral lymph node' (LLN) was devised to encompass the common, external and internal iliac and obturator nodes in relation to rectal malignancies. The spread to these areas accounts for a significant proportion of the disease, with a reported incidence of 10–25 per cent [(3)].

The standardization of the technique of total mesorectal excision (TME) with accurate dissection of the anatomical plane enveloping the rectum and mesorectum constitutes major progress in rectal cancer surgery. TME has achieved much lower local recurrence rates [(4)].

Moreover, progress in chemoradiotherapy has achieved good local control and better survival rates in many Western countries.In Japan, rectal cancer with LLN involvement is considered a locally-advanced disease, and autonomic nerve-preserving LPND has now become a standard surgical treatment. However, LLN disease in Western countries is generally considered metastatic in nature, and patients are usually subject to neoadjuvant cheomoradiotherapy followed by total mesorectal excision (TME) surgery [(5)].

Magnetic resonance imaging (MRI) is assumed to be an optimal diagnostic modality for tumor staging in rectal cancer due to its high soft-tissue contrast [(6)]. However, there is a wide-ranging accuracy of 62±85% and a relatively poor sensitivity for lymph node staging [(7)].

AIM OF THE WORK

Evaluation of lateral pelvic lymph node involvement among patients with middle and low rectal carcinoma.

PATIENTS AND METHODS

A descriptive prospective study was conducted at Surgical Unit of Oncology Bab Elshaarya University Hospital, Al Azhar University, during the period between November 2018 and July 2019 (a total period of 8 months), in which 20 patients of middle and low rectal carcinoma were identified. Patients fulfilling the inclusion criteria were treated with lateral pelvic lympahdenectomy plus ultralow anterior resection, low anterior resection or intersphincteric resection to study the percentage of lateral pelvic lymph node involvement in middle and low rectal carcinoma and it's correlation with radiology; The number and groups of pelvic LN involved; and its relation with site; grade and stage of the primary tumor; Operative complications of study group.

Inclusion Criteria:

1. Operable Cases of primary middle and low rectal cancer.
2. Medically and anesthetically fit patients.

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3. Patients that did not receive neoadjuvant therapy.
4. All Tumor grades of differentiation.
5. Stage I-III rectal cancer.
6. Cases candidates for sphincter saving procedures.

Exclusion Criteria

1. Non-operable cases of rectal cancer patients.
2. Medically and anesthetically unfit patients.
3. High tumors above the peritoneal reflection.
4. Tumor Stage IV with unresectable metastasis.
5. Non Invasive Cancer.
6. Previous pelvic lymphadenectomy for a disease other than rectal cancer.
7. Tumour recurrence.
8. Irresectable lesion.

Ethical consideration and Written informed consent:

An approval of the study was obtained from Al- Azhar University Academic and Ethical Committee. Every patient signed an informed written consent for acceptance of the operation.

Preoperative preparation:

All patients were subjected to the following:

1- Full history with history of neoadjuvant therapy, clinical examination and clinical staging.

2- Complete laboratory investigations included:

- Complete blood picture, complete liver functions, serum blood glucose, and renal function tests.
- Tumour markers including CEA and CA19-9.

3- Complete radiological investigations: to evaluate the stage of the disease and to exclude metastases:

A- Abdominal and Pelvic CT or MRI: to determine the location, extend and local invasion of the tumour and also to detect liver metastases.

B- Metastatic workshop.

4- Endoscopic investigations: Colonoscopy for full assessment of the colon and rectum.

5- Pathological diagnosis: endoscopic biopsy.

Pre-anesthetic assessment:

Including

1. Cardiac and chest examination.
2. ECG and Echo-cardiography.
3. Blood pressure.

Patient's preparation:

1. Colonic preparation by conventional method.
2. Pre-operative antibiotics.
3. Prophylaxis against deep venous thrombosis (DVT): patient received LMWH at the night of operation and elastic stocking during surgery and postoperative until the patient become ambulant.
4. Insertion of epidural catheter to be used for post-operative epidural analgesia in some cases.
5. Urinary catheter just preoperative.

Surgical technique:

- Anesthesia: All procedures were performed under general anesthesia with endotracheal intubation.
- Position: Patient positioned supine with sacrum positioned over the table break or over a roll to allow for hyperextension and better vision into the pelvis.
- Incision: The abdomen is entered through an extended lower midline incision, Assisted Laproscopic or T.A.T.M.E operation.
- Exploration: Careful inspection of the abdominal cavity, liver and pelvis was done, to exclude the evidence of disseminated disease.
- Pelvic lymphadenectomy:

It was done for all patients:

1. Lateral Pelvic Lymph node Dissection consists of a complete dissection of the endopelvic fascia together with the rectum, mesorectum , and all lymph nodes as well as the lymphatic cellular tissue medially to the common and internal iliac vessels. Clearance of the obturator region was performed preserving the obturator nerve, and the superior vesical artery.
2. The internal iliac vessels were exposed and dissected to uncover the root of the middle rectal artery and the middle rectal vein which are ligated and divided at their root.
3. After complete mobilization of the lateral aspect of the rectum, the lateral vesical and obturator spaces are opened between the internal iliac vessels and the pelvic side wall, and clearance of lateral lymphatic tissue in these spaces is carried out while preserving the obturator nerve and vessels and the visceral and parietal branches of the internal iliac vessels, such as the superior gluteal and the pudendal vessels.

Low anterior resection; ultralow anterior resection or intersphicteric resection was done. Then refashioning of the route of the fecal passage: either by colo-anal anastomsis with temporary covering ileostomy (in intersphicteric and ultralow anterior resection) or colo-rectal anastomosis with temporary covering ileostomy in low rectal carcinoma.

- After careful hemostasis multiple drains were inserted for adequate drainage then Closure of the abdominal wall in layers.
- All patients were given prophylactic triple antibiotics, and daily LMWH given regularly as a prophylaxis again DVT.
- All patients started oral within 2-4 postoperative days.

Statistical analysis

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed

as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

The following tests were done:

- Independent-samples t-test of significance was used when comparing between two means.
- Chi-square (x^2) test of significance was used in order to compare proportions between two qualitative parameters.
- The confidence interval was set to 95% and the margin of error accepted was set to 5%. The p-value was considered significant as the following:
- Probability (P-value)
  - P-value <0.05 was considered significant.
  - P-value <0.001 was considered as highly significant.
  - P-value >0.05 was considered insignificant.

RESULTS

During the period between November 2018 and July 2019 (a total of 8 months), 20 patients with middle and low rectal cancer were enrolled in the study; 8 patients were males and 12 were females. Age range was 29 – 65 years: one (below 30 years), 5 (below 40 years), 14 (above 40 years). Patients were treated by lateral pelvic lymphadenectomy plus Low anterior resection (10 cases); or intersphincteric resection (10 cases).

All the patients were evaluated on the protocol discussed in the patients and method. For each, a clinical history was taken, general, abdominal and P.R. examinations were conducted to evaluate resectalbility and extension of the tumor. Along with E.C.G. , biochemical investigations (complete blood count, liver function tests , kidney function tests , blood sugar and tumor markers CEA&CA 19-9) ; radiological investigations ;

(Abdominal and pelvic CT or MRI, abdominal ultrasonography, X- ray chest), Endoscopic and pathological investigations (punch biopsy).

Table (1): Showed patients characteristics, with a mean age of 48.85 ± 12 years (range from 29 – 65). 8 patients were males and 12 patients were females, 11 were diabetic, 11 were hypertensive and 7 were smokers.

Table (1): Basic characteristics of the patients.

Variable		**Total no. = 20**
Age	Mean ± SD	48.85 ± 12.00
	Range	29 – 65
Sex	Females	12 (60.0%)
	Males	8 (40.0%)
DM	Negative	11 (55.0%)
	Positive	9 (45.0%)
HTN	Negative	11 (55.0%)
	Positive	9 (45.0%)
Smoking	Negative	13 (65.0%)
	Positive	7 (35.0%)

Table (2): Showed the tumor markers, operation and operative time. 14 patients (70%) have negative CEA and 6 (30%) have positive CEA , while 17 patients (85%) have negative CA19-9 and 3 patients (15%) have positive CA19-9. 10 patients (50%) were submitted to Low anterior resection and 10 patients (50%) were submitted to intersphincteric resection. The mean operative time was (173.35 ± 13.25 min) with range from (152 to 198 min).

Table (2): Tumor markers , operation and operative time of the patients.

Tumor Markers		**Total no. = 20**
CEA	Negative	14 (70.0%)
	Positive	6 (30.0%)
CA19-9	Negative	17 (85.0%)
	Positive	3 (15.0%)
Operation	Low Ant. Resection	10 (50.0%)
	Intersphincteric resection with coloanal anastomosis	10 (50.0%)
Operative Time /Min.	Mean ± SD	173.35 ± 13.25
	Range	152 – 198

Table (3): Showed the postoperative pathology of rectal cancer among the studied group. All patients have rectal adenocarcinoma. 17 patients (85%) with grade 2 and 3 patients (15%) with grade 3. 15 patients (75%) with vascular invasion and 5 patients (15%) with no vascular invasion.

Table (3): Postoperative pathology of rectal cancer among the studied patients.

Pathology Post.		**Total no. = 20**
Type	Adenocarcinoma	20 (100.0%)
Grade	2	17 (85.0%)
	3	3 (15.0%)
Vascular Invasion	No	5 (25.0%)
	Yes	15 (75.0%)

Table (4) shows the postoperative complications among the studied group. 9 patients (45%) accompanied of lower abdominal and anal pain. 13 patients (65%) complicated by postoperative fever. 7 patients (35%) complicated by wound infection.

1 patient (5%) with pain at the anal anastomosis. 3 patients (15%) complicated by prolonged ileus. 1 patient (5%) complicated by pelvic abscess. 1 patient (5%) complicated by prolonged lymph drainage.

Table (4): Postoperative complications among the studied patients.

Complications	Total no. = 20
Lower abd. Pain	9 (45.0%)
Postoperative fever	13 (65.0%)
Wound infection	7 (35.0%)
Pain at anal anastom.	1 (5.0%)
Prolonged ileus	3 (15.0%)
Pelvic abscess	1 (5.0%)
Prolonged lymph drainage	1 (5.0%)

Table (5) shows the relation between the positivity and demographic data of the patient. Among 16 negative patients there were 8 male patients and 8 female patients and among positive patients 4 female patients have positive lymph nodes and no males with positive lymph nodes with no significant P-value.

16 patients with negative pelvic lymph nodes 8 of them have DM and 4 patients with positive pelvic lymph nodes 3 of the have DM with no significant P-value.

16 patients with negative pelvic lymph nodes 6 of them have HTN and 4 patients with positive pelvic lymph nodes 3 of them have HTN with no significant P-value.

16 patients with negative pelvic lymph nodes 7 of them were smokers and 4 patients with negative pelvic lymph nodes all of them were non-smokers with no significant P-value.

Table (5): Relations between lymph nodes positivity and demographic data of the patients.

Variables		Positive L.N		Test value	P-value	Sig.
		Negative	Positive			
Age	Mean ± SD Range	47.75 ± 11.02 33 – 65	53.25 ± 16.50 29 – 65	-0.812	0.427	NS
Sex	Females	8 (50.0%)	4 (100.0%)	3.333	0.068	NS
	Males	8 (50.0%)	0 (0.0%)			
DM	Negative	8 (50.0%)	3 (75.0%)	0.808	0.369	NS
	Positive	8 (50.0%)	1 (25.0%)			
HTN	Negative	10 (62.5%)	1 (25.0%)	1.818	0.178	NS
	Positive	6 (37.5%)	3 (75.0%)			
Smoking	Negative	9 (56.3%)	4 (100.0%)	2.692	0.101	NS
	Positive	7 (43.8%)	0 (0.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test; •: Independent t-test

Table (6) shows the relation between the clinical presentation and pelvic lymph nodes status. 4 patients presented with constipation 2 of them have positive pelvic lymph nodes and 2 of the have negative pelvic lymph nodes with no significant P-value.

9 patients presented by marked weight loss 3 of them have positive pelvic lymph nodes and 6 of them have negative pelvic lymph nodes with no significant value.

5 patients presented by lower abdominal pain 1 of them have positive pelvic lymph nodes and 4 of them with negative pelvic lymph nodes with no significant value.

Table (6): Relations between the clinical presentations of the patients and pelvic lymph nodes status.

Presentation	Positive LN		Test value*	P-value	Sig.
	Negative	Positive			
Constipation	2 (12.5%)	2 (50.0%)	2.813	0.094	NS
Marked weight loss	6 (37.5%)	3 (75.0%)	1.818	0.178	NS
Pain	4 (25.0%)	1 (25.0%)	0.000	1.000	NS

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test

Table (7) shows the relation between the colonoscopic characteristics of the tumor and pelvic lymph node status.

- Mean site for negative patients (5.25 ± 2.54) and mean site for positive patients (6.25 ± 2.99) with no significant P-value.
- Mean length for negative patients (6.31 ± 2.55) and mean length for positive patients (5.50 ± 058) with no significant P-value.

16 patients with negative pelvic lymph nodes , 14 (87.5%) of them have circumferential tumor and 2 (12.5%) of them the tumor located at the left side and 4 patients with positive lymph nodes 3 of them have circumferential tumor and 1 of them the tumor located at the left side with no significant P-value .

Table (7): Relations between the colonoscopic characteristics of the tumor and pelvic lymph node status.

Colonoscopy		Positive LN		Test value	P-value	Sig.
		Negative	Positive			
Site (cm)	Mean ± SD Range	5.25 ± 2.54 3 – 10	6.25 ± 2.99 3 – 10	-0.682	0.504	NS
Length (cm)	Mean ± SD Range	6.31 ± 2.55 3 – 10	5.50 ± 0.58 5 – 6	0.622	0.542	NS
Location	Circum.	14 (87.5%)	3 (75.0%)	0.392	0.531	NS
	Lt. Side	2 (12.5%)	1 (25.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test; •: Independent t-test

Table (8) shows the relation between the pathology of colonoscopic specimen and pelvic lymph nodes status.

20 patients with adenocarcinoma 4 of them are mucinous 3 with negative pelvic lymph nodes and 1 with positive pelvic lymph nodes with no significant P-value.

16 patients with negative pelvic L.Ns, 15(93.8%) of them were grade two and one (6.3%) of them were grade three and 4 patients with positive pelvic L.Ns 2 (50%) of them were grade two and 2 (50%) of them were grade 3 with significant P-value for grade 3.

16 patients with negative pelvic L.Ns, 3 of them with no vascular invasion and 13 of them with vascular invasion and 3 patients with positive pelvic L.Ns all (100%) of them with vascular invasion, no significant P-value .

Table (8): Relations between the pathology of colonoscopic specimen and pelvic lymph nodes status.

Pathology		Positive LN		Test value *	P-value	Sig.
		Negative	Positive			
Type	Adeno-carcin.	13 (81.3%)	3 (75.0%)	0.078	0.780	NS
	Adeno-carcin. Mucinous	3 (18.8%	1 (25.0%)			
Grade	2	15 (93.8%)	2 (50.0%)	4.804	0.028	S
	3	1 (6.3%)	2 (50.0%)			
Vascular invasion	No	3 (18.8%	0 (0.0%)	0.882	0.348	NS
	Yes	13 (81.3%)	4 (100.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test

- Table (9) shows the relation between postoperative complications and the status of pelvic lymph nodes among study group.
  16 patients with negative pelvic L.Ns, 6 (37.5%) of them complaining of lower abdominal pain, 9 (56.3%) of them complicated by postoperative fever , 5 (31.3%) of them complicated by wound infection , 1 (6.3%) of them complaining of pain at anal anastomosis , 2 (12.5%) of them complicated by prolonged ileus and 1 (6.3%) of them complicated by prolonged lymph drainage with no significant P-value.
- 4 patients with positive pelvic L.Ns, 3 (75%) of them complicated by lower abdominal pain, 4 (100%) of them complicated by postoperative fever, 2 (50%) of them complicated by wound infection, 1 (25%) of them complicated by prolonged ileus and 1 (25%) of them complicated by pelvic abscess, with no significant P-value.

Table (9): Relations between postoperative complications and the status of pelvic lymph nodes among studied patients.

Complications	Positive LN		Test value*	P-value	Sig.
	Negative	Positive			
Lower abd. Pain	6 (37.5%)	3 (75.0%)	1.818	0.178	NS
Postoperative fever	9 (56.3%)	4 (100.0%)	2.692	0.101	NS
Wound infection	5 (31.3%)	2 (50.0%)	0.495	0.482	NS
Pain at anal anastom.	1 (6.3%)	0 (0.0%)	0.263	0.608	NS
Prolonged ileus	2 (12.5%)	1 (25.0%)	0.392	0.531	NS
Pelvic abscess	0 (0.0%)	1 (25.0%)	4.211	0.040	S
Prolonged lymph drainage	1 (6.3%)	0 (0.0%)	0.263	0.608	NS

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test

DISCUSSION

Our study was conducted on 20 patients with middle and low rectal cancer, 8 males and 12 females ; with mean age of 48.85+/-12.00 (range from 29 to 65 years).They were treated with lateral pelvic lymphadenectomy + low anterior resection or intersphincteric resection . The main concern is to study the percentage of lateral pelvic lymph node involvement in middle and low rectal cancer and it's correlation with radiology ; the number and groups of pelvic LN involved ;and it's relation to site; grade and stage of the primary tumor and operative complications.

In our study the most common presentation was bleeding per rectum (100%), followed by Marked weight loss (45%), then pain (25%) , then constipation (20%). **Moreno *et al.*** [8] reported that the most frequent symptoms in series of 388 CRC patients between 2011 and 2014 included the following: bleeding per rectum (37 %), abdominal pain (34%) , anemia (23%), change in bowel habits (1.3%).

In our study CT and MRI reveals positive mesorectal L.Ns 12/20 (60%) and pelvic L.Ns 5/20 (25%) .Preoperative radiological staging showed that 10 (50%) patients were stage 2 and 10 (50%) patients were stage 3.

Ishibe *et al.* [9] Lateral pelvic lymph-node metastasis was diagnosed on preoperative MRI in 16 patients (19.9 %). The overall patient-based sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of MRI were 75, 69.1, 36.4, 92.2, and 70.2 %, respectively. When a cut-off value of 10 mm was used for diagnosis, the corresponding values were 43.8, 98.5, 87.5, 88.1, and 88.1 %, respectively. The mean diameter of metastatic nodes (14.7 mm) was significantly larger than that of negative nodes (5.7 mm; $P < 0.01$).

Jhaveri *et al.* [10] MRI is the modality of choice for staging rectal cancer to assist surgeons in obtaining negative surgical margins. MRI facilitates the accurate assessment of mesorectal fascia and the sphincter complex for surgical planning. Multiparametric MRI may also help in the prediction and estimation of response to treatment and in the detection of recurrent disease.

Nie *et al.* [11] through a systematic analysis of multiparametric MR imaging features, we are able to build models with improved predictive value over conventional imaging metrics. The results are encouraging; suggesting the wealth of imaging radiomics should be further explored to help tailoring the treatment into the era of personalized medicine.

Battersby *et al.* [12] Overall pCRM involvement was 9.0% [95% confidence interval (CI), 5.9–12.3], significantly lower than previously reported rates of 30%. Patients with no adverse MRI features and a "safe" mrLRP underwent sphincter-preserving surgery without preoperative radiotherapy, resulting in a 1.6% pCRM rate. The pCRM rate increased 5-fold for an "unsafe" compared with "safe" preoperative mrLRP [odds ratio (OR) = 5.5; 95% CI, 2.3–13.3)]. Posttreatment MRI reassessment indicated a "safe" ymrLRP in 33 of 113 (29.2%), none of whom had ypCRM involvement. In contrast, persistent "unsafe" ymrLRP posttherapy resulted in 17.5% ypCRM involvement. Further independent MRI assessed risk factors were EMVI (OR = 3.8; 95% CI, 1.5–9.6), tumors less than 4.0 cm from the anal verge (OR = 3.4; 95% CI, 1.3–8.8), and anterior tumors (OR = 2.8; 95% CI, 1.1–6.8)

On exploration of our patients: 4 patients (20%) have lateral pelvic LN infiltration; 11 patients (55%) have positive mesorectal LNs ; 4 patients (20%) have both mesorectal and lateral pelvic L.Ns metastases.

Ogura *et al.* [13] LPLN metastasis was found in 26 patients (24.3 %) in the LPLND group. **Furuhata *et al.* [14]** the mean number of harvested lateral pelvic lymph nodes was 16.9 (7–27), and five patients (27.8 %) had lymph node metastases. **Sugihara *et al.* [15]** stated that Positive LLN was found in 129 patients (13.9 percent of patients with PSD).

Akiyoshi *et al.* [1] LPLN metastasis was confirmed in 31 patients (40.3 %). Metastasis was significantly higher in patients with LPLNs with a short-axis diameter ≥8 mm than in patients with LPLNs with a short-axis diameter <8 mm before CRT (75 vs. 20 %, $P < 0.0001$). LPLN metastasis was also significantly higher in patients with LPLNs with a short-axis diameter >5 mm than in patients with LPLNs with a short-axis diameter ≤5 mm after CRT (75 vs. 20 %, $P < 0.0001$). Multivariate analysis showed the independent association of female sex [$P = 0.0192$; odds ratio (OR) 5.616; 95 % confidence interval (CI) 1.315–28.942], pre-CRT short-axis diameter of the LPLN ≥8 mm ($P = 0.0047$; OR 9.188; 95 % CI 1.948–54.366), and CRT without induction systemic chemotherapy ($P = 0.0285$; OR 9.235; 95 % CI 1.241–106.947) with LPLN metastasis. **Kim *et al.* [16]** Pathologic LPN metastatic rate was not different between groups (robotic vs. laparoscopic group, 28.0 vs. 41.2%; $P = 0.243$).

In our study the median number of dissected LPLN 13 with range from 6 to 47 LN.

The pathology among the studied group was adenocarcinoma 20/20 (100%). 17(85%) of them were grade 2 and 3(15%) of them were grade 3. **Kobayashi *et al.*[16]** showed that 117 out of 784 (14.9%) patients of rectal cancer had positive lateral pelvic lymph nodes. According to the depth of invasion, the incidence of positive lateral nodes was 5.4% in pT1, 8.2% in pT2, 16.5% in pT3, and 37.2% in pT4**.**

The grade of the primary tumor in patients with pelvic L.N involvement was grade three in 2 cases and grade two in 2 cases. **Fujita *et al.* [17]** showed more prevalence of well and moderate differentiated tumors.

The stage of primary tumor of patients with involved L.Ns was stage 3 (75% of patients with positive pelvic L.Ns).

Postoperative complication in our study: 9 patients (45%) accompanied of lower abdominal and anal pain. 13patients (65%) complicated by postoperative fever. 7 patients (35%) complicated by wound infection. 1 patient (5%) with pain at the anal anastomosis. 3 patients (15%) complicated by prolonged ileus. 1 patient (5%) complicated by pelvic abscess . 1 patient (5%) complicated by prolonged lymph drainage.

Fujita *et al.* [17] stated that the most common complication with LPLND wound infection followed by anastomotic leak then ileus. **Fujita *et al.* [18]** stated that the most common complication in patients submitted to TME + LPLND was urinary retention (18%) followed by anastomotic leak (18%) then infection with normal neutrophil count (16%), wound infection (10%) and pelvic abscess (2%).

CONCLUSION

- The most common presentation of low rectal cancer is bleeding per rectum, followed by constipation and pain.
- 20% of patient with low rectal cancer have iliac lymph nodes infiltration; 55% have positive mesorectal LN and 20 % have both iliac and mesorectal LN.
- The more tumour invasion, the more likehood of lateral pelvic nodal metastasis.
- The lower the level of the lesion, the higher the possibility of positive iliac lymphadenopathy.
- Sites of involved iliac lymph nodes included obturator and internal iliac region.
- Surgical mortality of LPLD is low, but there is an increase of morbidities in the form of prolonged operative time, intraoperative blood loss and genito-urinary malfunction.

- For avoiding the drawbacks of LPLD extended lymphadenectomies with sparing of the pelvic nerves is recommended.
- Lateral pelvic lymph node involvement is a regional disease that is curable.
- LPLD was effective to control recurrence at lateral nodes sites.
- Mesorectal lymph nodes are positive in all patients with positive iliac nodes.
- 50% of lateral lymph nodes, which are radiologically negative, have micrometastases.
- T.M.E. is a standard operation for rectal carcinoma due to high incidence of mesorectal lymph node metastases.
- T.A.T.M.E. is a promising technique in rectal surgery especially in low rectal cancers.

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