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Lateral pelvic lymphadenectomy for low rectal cancer

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Abstract---Background: Uncertainty exists regarding importance of lateral pelvic lymph node metastases in advanced low rectal cancer. Our research identified LPLD-related oncological prognosis in studied cases with rectal cancer below peritoneal reflection. Methods: We examined studied cases at Al Haram Hospital who received LPLD between May 2015 and December 2020 & had clinical stage II-III low rectal cancer below peritoneal reflection. Results: there had been no correlation among pelvic LN & colonoscopy & there had been no correlation among pelvic LN & pathology. Conclusion: When compared to entire mesorectal excision alone, lateral pelvic lymph node dissection had not been significantly related with decrease in recurrence rates or enhancement in survival; nevertheless, LPLND had been linked to higher complication rate. Key words: Lateral pelvic lymph node dissection. Local recurrence, Rectal cancer, Surgical strategies, Surgical outcomes, Survival outcomes.

Keywords---lateral pelvic, lymphadenectomy, rectal cancer.

Introduction

When compared to colon cancer, rectal cancer surgery has historically had worse prognosis. The limited pelvis and proximity to the ureter, bladder, and prostate prevented wide surgical resection of this tumour (1). Although local recurrence rates have decreased & disease-free survival has increased over past 20 years, therapy of rectal cancer has changed (2). Treatment of locally advanced rectal cancer presents difficulties for both clinicians & studied cases in terms of influence on long-term functional & cancer-specific outcomes as well as degree of aggressiveness of treatment (3). usual therapies for advanced low-rectal cancer to lessen local recurrence have been preoperative chemoradiotherapy & total mesorectal excision. But even without circumferential resection margin that was implicated, local recurrence may happen (4). Organ preservation, protection of autonomic nerve supply, & potential role for lateral pelvic lymph node

dissection are additional concerns with reference to surgical strategy & radicality of resection (5).

For middle or lower rectal cancer, lateral pelvic lymph node dissection is demonstrated to have lower local recurrence rate than traditional surgery (6). Urinary & sexual disruption, longer operating time, & more blood loss than with normal surgery are all issues related to LPLD (7). studied cases with lateral lymph node metastases have bad prognosis, & number of studied cases who benefit from LPLD could be few, which explains inconsistent results of LPLD (8). In studied cases with rectal cancer below peritoneal reflection, goal of current research has been to ascertain oncological outcome related to LPLD.

Material and Methods

Patients at Al Haram Hospital who have stage II or stage III middle or lower rectal cancer that is at or under peritoneal reflection are candidates for LPLD between May 2015 & December 2020. We looked at studied cases who underwent curative surgery for lower rectal cancer at stages II & three (below peritoneal reflection). Clinical Staging & Treatment Plan: The MDCT or MRI had been used to determine the pretreatment clinical stage. Low rectal cancer is described as tumour with inferior border that is eight cm or lower from anal margin and below peritoneal reflection. Before CRT, degree of peritoneal reflection had been evaluated using barium enema (middle Houston's valve is thought to correspond to peritoneal reflection). total dose of forty five Gy or 50.4 Gy of five-fluorouracil-based CRT was administered to the patients. Typically, radiation target volume encompassed lateral pelvic region. Following the conclusion of preoperative CRT, surgery was done four to eight weeks later. Unilateral LPLD was performed independently of imaging results following CRT if preoperative MDCT or MRI prior to CRT revealed unilaterally enlarged LPLNs (LPLD group). Bilateral LPLD had been done if preoperative imaging revealed bilaterally enlarged LPLNs. In the absence of enlarged LPLNs, just normal TME had been carried out (TME group). Although multidisciplinary team meetings ultimately decided whether swollen LPLNs had been indicative of LPLD, they had been typically deemed to measure seven mm or larger. At our hospital, pathologically node-positive disease had been primary indication for adjuvant chemotherapy, but at surgeon & oncologist's discretion, adjuvant chemotherapy had been given to some pathologically node-negative studied cases.

Based on JSCCR classification, lateral pelvic area is divided into 4 regions: internal iliac, obturator, external iliac, & common iliac (9). external iliac artery, pelvic plexus, bifurcation of common iliac artery, levator ani muscle, & sciatic nerve are lateral, medial, cranial, caudal, & dorsal anatomical borders of LPLD, respectively. decision to preserve internal iliac artery or any of its branching arteries, including umbilical, superior or inferior vesical, or obturator artery while removing LPLN, is at surgeon's discretion. However, if metastatic LPLN invasion is suspected, we typically resect nearby artery. In accordance with 7th edition of American Joint Committee on Cancer (AJCC) Cancer Staging Manual, pathologic stage (ypT & ypN) had been identified (10).

Size of LPLNs on MDCT: Without any prior preparation, all studied cases had MDCT with Sixteen pelvic & abdominal detectors (Light Speed; GE Medical Systems, Milwaukee, WI). Slice interval had been set to five mm & contrast medium (Iopamiron; Bayer, Osaka, Japan) had been supplied intravenously. Onto workstation (HOPE/ EGMAIN-EX, Fujitsu, Tokyo, Japan), sequences had been downloaded. anatomy of lateral pelvis & gastrointestinal radiologist, as well as colorectal surgeon who had been blind to studied cases' clinical information, retrospectively assessed all of pictures. Using digitised pictures taken before & after CRT, we used electronic callipers to estimate maximum long-axis & corresponding short-axis diameter of LPLN following bifurcation of common iliac artery.

Results

Table 1
Distribution of cases based on baseline data

	Cases (n = 24)	
Age		
Range.	31 – 70	
Mean ± SD.	49.04 ± 11.42	
Gender		
Woman	15.00	62.50
Man	9.00	37.50
Comorbidities		
Diabetes	11	45.8
Hypertension	12	50.0
Smoking	6	25.0

This table shows that the mean age of the studied cases was 49.04 (±11.42 SD) with range (31-70) years, among the studied cases there were 15 (62.5%) female and 9 (37.5%) male, there were 11 (45.8%) with DM and 12 (50%) with HTN and there were 6 (25%) smokers.

Table 2
Distribution of cases based on pelvic lymph nodes

	Cases (n = 24)	
State of pelvic lymph nodes		
Negative	18	75.0
Positive	6	25.0

This table shows that among the studied cases there were 18 (75%) with negative LN and 6 (25%) with positive LN.

Table 3
Relation between pelvic LN and presentation

	pelvic LN				χ^2	p
	Negative (n=18)		Positive (n=6)			
	No.	%	No.	%		
Constipation	4	22.2	2	33.3	0.296	0.586
Marked weight loss	8	44.4	3	50.0	0.056	0.813
Pain	4	22.2	1	16.7	0.084	0.772

χ^2: Chi square test
p: p value to compare among studied groups
*: Statistically significant at $p \leq 0.05$
This table finds that there had been no correlation among pelvic LN & presentation.

Table 4
Relation between pelvic LN and Colonoscopy

	pelvic LN				Test	p
	Negative (n=18)		Positive (n=6)			
Size (cm)						
Range.	3 – 8		3 – 10		t= 0.124	0.903
Mean ± SD.	5.39 ± 1.54		5.5 ± 2.81			
Length (cm)						
Range.	2 – 10		5 – 6		t= 0.634	0.532
Mean ± SD.	6.5 ± 2.53		5.83 ± 0.41			
Location	No.	%	No.	%		
Constipation	15	83.3	5	83.3	χ^2= 0.0	1.0
Marked weight loss	3	16.7	1	16.7		

SD: Standard deviation
χ^2: Chi square test t: student t-test
p: p value to compare among studied groups
*: Statistically significant at $p \leq 0.05$

This table shows that there had been no correlation among pelvic LN & colonoscopy.

Table 5
Relation between pelvic LN and Operation data

	pelvic LN				Test	p
	Negative (n=18)		Positive (n=6)			
Operative Time (Min)						
Range.	152 – 195		156 – 187		t= 0.374	0.712
Mean ± SD.	171.28 ± 14.23		173.67 ± 10.89			
Operation type	No.	%	No.	%		
Intersphincteric resection with coloanal anastomosis	9	50.0	3	50.0	χ^2= 0.0	1.0
Low Ant. Resection	9	50.0	3	50.0		

SD: Standard deviation
χ^2: Chi square test t: student t-test
p: p value to compare among studied groups
*: Statistically significant at $p \leq 0.05$

This table shows that there was no statistically significant relation between pelvic LN and operation data.

Table 6
Relation between pelvic LN and pathology

	pelvic LN				χ^2	p
	Negative (n=18)		Positive (n=6)			
Type	No.	%	No.	%		
Adenocarcin	14	77.8	4	66.7	0.296	0.586
Adenocarcin. Mucino us	4	22.2	2	33.3		
Grade						
2	17	94.4	4	66.7	3.175	0.075
3	1	5.6	2	33.3		
Vascular invasion	15	83.3	6	100.0	1.143	0.285

χ^2: Chi square test
p: p value to compare among studied groups
*: Statistically significant at $p \leq 0.05$

This table finds that there had been no correlation among pelvic LN & pathology.

Table 7
Relation between pelvic LN and Complications

	pelvic LN				χ^2	p
	Negative (n=18)		Positive (n=6)			
	No.	%	No.	%		
Lower abd. Pain	7	38.9	3	50.0	0.229	0.633
Postoperative fever	9	50.0	6	100.0	4.800	0.028*
Wound infection	5	27.8	3	50.0	1.000	0.317
Pain at anal anastom	2	11.1	0	0.0	0.727	0.394
Prolonged ileus	3	16.7	1	16.7	0.0	1.0
Pelvic abscess	0	0.0	2	33.3	6.545	0.011*
Prolonged lymph drainage	3	16.7	0	0.0	1.143	0.285

χ^2: Chi square test
p: p value to compare among studied groups
*: Statistically significant at $p \leq 0.05$

This table finds that there had been correlation among pelvic LN & postoperative fever and pelvic abscess.

Discussion

Following adoption of entire mesorectal excision during conventional surgical procedures & neoadjuvant chemoradiotherapy (11), Locally advanced rectal cancer had five–year local recurrence rate of five percent–ten percent (12). frequency of lateral lymph node metastasis in locally progressed rectal cancer below peritoneal reflection is sixteen percent–twenty three percent (13), This goes beyond parameters of standard TME dissection. Moreover, mounting evidence points that LPN metastasis as significant contributor of LR following surgery (14). There has been ongoing debate globally regarding efficacy of lateral pelvic lymph node dissection as prophylactic & maybe curative operation for lateral pelvic recurrence (15). Surgeons in western nations prefer to use TME alone & view LPN metastasis as systemic illness (apart from internal iliac lymph nodes) (16).

Contrarily, according to recommendations in Japan, LPN metastasis has been regarded as local metastasis that primarily affects people with middle-low cT3-T4 rectal cancer; also, LPND demonstrated therapeutic benefits (17). Thus, as standard treatment for advanced low rectal cancer, Japanese Society for Cancer of Colon & Rectum advised TME plus central D3 resection & preventive LPND (18). TME with LPND had been more successful at suppressing LR in lateral pelvis, such as LPNs, than TME alone at improving overall survival in JCOG0212 large-scale clinical trial (19). Additional, Kanemitus et al. (20) noted that 1,191 rectal cancer studied cases from two high-volume centres in Japan underwent TME with LPND; findings revealed that treatment of superior rectal artery lymph node dissection & dissection of internal iliac & obturator lymph nodes had been comparable. Even so, risk of LR throughout unilateral LPND had been twice as high as that of bilateral LPND.

In this study we found that the mean age of the studied cases was 49.04 (±11.42 SD) with range (31-70) years, among the studied cases there were 15 (62.5%) female and 9 (37.5%) males, there were 11 (45.8%) with DM and 12 (50%) with HTN and there were 6 (25%) smokers. Similarly, Elsheekh et al. (21) Eight men & twelve women with intermediate & low rectal cancer participated in the research, which had mean years old of 48.85+/-12.00. (Range from twenty nine to sixty five). Treatment options included intersphincteric resection or lateral pelvic lymphadenectomy plus low anterior resection. In study to assess Effective dissecting range & prognostic significance of lateral pelvic lymph node dissection for middle-low rectal cancer studied cases with lateral pelvic lymph node metastasis, Zhou et al. (22) found that average years old of recruited studied cases was 57.2, and majority (sixty one percent) had been female.

In this study we demonstrated that among the studied cases there were 18 (75%) with negative LN and 6 (25%) with positive LN. Ogura et al. (23) found that twenty-six individuals (24.3percent) in LPLND group had LPLN metastases. Furuhata et al. (24) found that average number of lateral pelvic lymph nodes extracted ranged from 7.9 to 27, & 5.0% of studied cases had lymph node metastases. Kim et al. (25) indicated that 129 studied cases had Positive LLN (13.9% of studied cases with PSD). Akiyoshi et al. (26) found that LPLN metastasis had been proven in thirty-one studied cases (40.3 %). In this study we illustrated that there had been no correlation among pelvic LN & presentation. Elsheekh et al. (21) found that Constipation was reported by four studied cases. With no statistically significant P-value, two of them have positive pelvic lymph nodes & two have negative pelvic lymph nodes. Nine studied cases showed significant decrease of weight. Three of them have healthy pelvic lymph nodes, while six have unimportantly negative pelvic lymph nodes. Five studied cases had lower stomach pain. One of them has healthy pelvic lymph nodes, while other four have unimportantly negative pelvic lymph nodes.

Moreno et al. (27) revealed that there had been no correlation among pelvic LN & presentation in series of 388 CRC studied cases among 2011 & 2014, with most common symptoms being bleeding per rectum (thirty seven percent), stomach discomfort (thirty four percent), anaemia (twenty three percent), & change in bowel habits (1.3percent). In this study we demonstrated that there had been no correlation among pelvic LN & pathology. Elsheekh et al. (21) found that twenty adenocarcinoma studied cases. There are Four of them that are mucinous, Three of which have negative pelvic lymph nodes & One of which has positive pelvic lymph nodes with insignificant Pvalue. Dev et al. (28) found that Mucinous and signet adenocarcinoma and poor differentiation/non-differentiation had been more common in positive LPN group, however results was still insignificant.

Kim et al. (29) Pathologic LPN metastatic rate had not been different among groups (28.0 vs. 41.2%; P = 0.243). In current research we cleared that there had been relation among pelvic LN and postoperative fever and pelvic abscess. Elsheekh et al. (21) found that four studied cases had positive pelvic L.Ns, Three (seventy five percent) had lower abdomen discomfort that was complicated, Four (one hundred percent) had postoperative fever, Two (fifty percent) had wound infection, One (twenty five percent) had delayed ileus, & one (25%) had pelvic abscess that was complicated, all with significant P-value. Similarly, Fujita et al.

(30) reported that anastomotic leak, ileus, and wound infection are most typical complications with LPLND.

In a recent study, Fujita et al. (31) indicated that urinary retention (eighteen percent), anastomotic leak (eighteen percent), infection with normal neutrophil count (sixteen percent), wound infection (ten percent), & pelvic abscess (two percent), were most frequent complications in studied cases who underwent TME + LPLND. Kiriyama et al. (32) found that in cases of rectal cancer postoperative morbidity rates reported in the literature varied from 18 to 44%, most common complication is surgical wound infection.

Conclusion

When compared to entire mesorectal excision alone, lateral pelvic lymph node dissection had not been significantly related with decrease in recurrence rates or improvement in survival; nevertheless, LPLND had been linked to higher complication rate.

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