LAPAROSCPIC VERSUS OPEN TOTAL MESORECTAL EXCISION FOR MIDDLE AND LOWER THIRD RECTAL CANCER: EVALUATION OF THE PATHOLOGICAL CRITERIA

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Introduction

- Laparoscopic colectomy was first reported in 1991 , and laparoscopic technique has been applied for the treatment of colorectal disease.
- A meta-analysis comparing laparoscopic with open colectomy for colon cancer which included :

- Barcelona trial
-COST trial
-COLOR trial
-CLASICC trial

have established the oncologic safety of laparoscopic surgery for colon cancer.

- Compared with laparoscopic colectomy, laparoscopic total mesorectal excision is more complex, but it is feasible.
- Despite the superior short term outcomes reported, the oncological outcome of laparoscopic surgery for rectal cancer was controversial.

- Total mesorectal excision (TME) is the mainstay of treatment for rectal adenocarcinoma which was introduced by Heald et al. as a technique to avoid the unacceptably high local recurrence rates associated with the conventional techniques.

- The main prognostic factors for rectal cancer is the macroscopic integrity of mesorectal fascia, the total number of lymph nodes harvested, and proximal, distal and circumferential resection margins.

- Laparoscopic surgery for rectal cancer offers several advantages in comparison with open surgery, including:

-less postoperative pain

-shorter duration of ileus

-shorter hospital stay

-less disability.

- To date, there is evidence that laparoscopy for rectal cancer offers the chance for a meticulous and easy dissection of the mesorectum under direct vision.

Aim of the work

- Evaluation of the efficacy of laparoscopy in total mesorectal excision for rectal cancer as regards the macroscopic integrity of mesorectal fascia, the total number of lymph nodes harvested and proximal, distal and circumferential resection margins as compared to open surgery.

Patients

- This study have been carried out prospectively on 40 patients in colorectal unit in Alexandria University who underwent elective total mesorectal excision for rectal cancer. Comparing 20 patients open (group A) and other 20 patients laparoscopic (group B).

- **Inclusion criteria:**

Patients with lower two thirds rectal adenocarcinoma stages II and III 6-8 weeks after finishing neoadjuvant therapy.

- **Exclusion criteria:**

Rectal tumors other than adenocarcinoma.

Emergency cases.

Patients with recurrent rectal carcinoma.

Stages IV rectal adenocarcinoma.

The mesorectum was graded according to the Quirke's graded assessment of completeness of mesorectal excision protocol.

Grade 3: Good

Intact mesorectum with only minor irregularities of a smooth mesorectal surface. No defect deeper than 5 mm. No coning on the specimen. Smooth circumferential resection margins (CRM) on slicing.

Grade 2: Moderate

Moderate bulk to the mesorectum but irregularity of the mesorectal surface. Moderate coning of the specimen toward the distal margin. At no site is the muscularis propria visible with exception of the insertion of the levator muscles. Moderate irregularity of the CRM.

Grade 1: Poor

Little bulk to the mesorectum with defects down into the muscularis propria and/or very irregular circumferential resection margin.

Grade 3 APR

Grade 2 APR

Grade 1 APR

Grade 3
LAR

Grade 2
LAR

Grade 1
LAR

- The CRM was considered to be involved when the tumor was within 1 mm of the resected CRM according to the criteria established by Quirke et al.
- All lymph nodes in the specimen should be placed in fat clearing solutions (xylene) then counted, sampled and processed for histo-patholiogical examination.

Characteristics of patients, tumors, and procedures: laparoscopic vs. open total mesorectal excision

Studied Variables	Lap (n=20)		Open (n=20)		Test of significance (P-value)
	N°	%	N°	%	
Age (years) $\overline{X}$ ±S Min-Max	45.4 ±11.22 31-65		48.55 ±14.24 24-71		Mann-Whitney test Z=-0.62 (p=0.533)
Sex Male Female	9 11	45.0 55.0	9 11	45.0 55.0	Chi-square test X^2=0.000 P=1.0
BMI (Kg/m2) $\overline{X}$ ±S Min-Max	22.3 ±1.53 20-25		23.0 ±1.49 20-26		Student t-test t=-1.47 (p=0.15)

Studied Variables	Lap (n=20)		Open (n=20)		Test of significance (P-value)
	N°	%	N°	%	
Procedure LAR APR	16 4	80.0 20.0	16 4	80.0 20.0	Fisher's exact test P=1.0
Distance from anal verge (cm) • LAR $\overline{X}$ ±S Min-Max	7.75 ±1.44 5-9		8.06 ±1.06 5-9		Mann-Whitney test Z=-0.378 (p=0.724)
• APR $\overline{X}$ ±S Min-Max	2.5 ±0.58 2-3		2.5 ±0.58 2-3		Mann-Whitney test Z= 0.000 (p=1.0)
Clinical Stage III T2 T3 T4	2 16 2	10.0 80.0 10.0	2 16 2	10.0 80.0 10.0	Monte Carlo test P=1.0

Pathological data on the surgical specimens resected: laparoscopic vs. open total mesorectal excision

Studied Variables	Lap (n=20)		Open (n=20)		Test of significance (P-value)
	N°	%	N°	%	
Mesorectal integrity					Monte Carlo test P=1.0
G3	10	50.0	11	55.0	
G2	8	40.0	8	40.0	
G1	2	10.0	1	5.0	
Number of LNs harvested					Mann-Whitney test Z=-0.336 (p=0.737)
$\overline{X}\pm S$	9.90 ±2.71		10.55 ±1.57		
Min-Max	4-13		8-13		

- **CRM involvement: None**
- **Distal & proximal margin involvement: None**

Conclusion

- The present study suggests that there are no statistical differences between the laparoscopic surgery and open surgery for rectal cancer in terms of the mesorectal integrity, number of lymph nodes harvested and the involvement of CRM in correlation to the stage.

- However, more high-quality and well designed RCTs are needed to evaluate the oncologic adequacy of resection and long-term oncologic outcomes of laparoscopic rectal cancer surgery.

Discussion

- The main problem for implementing laparoscopic surgery for rectal cancer (LSRC) is the more or less prolonged learning curve required, which does not guarantee accomplishment of the standards of quality established for this type of surgery.

- So, it is crucial that the team performing this type of surgery during the learning stage has a combination of:

-Thorough experience in open colorectal surgery

-Advanced laparoscopy techniques

-Specific LSRC training obtained at referral hospitals

- In these conditions, laparoscopic surgery can be performed safely during the learning curve, reaping its clinical benefits, without compromising the oncologic principles of resection or increasing procedure costs.


Thank You