

LAPAROSCOPIC VERSUS OPEN ABDOMINOPERINEAL RESECTION FOR LOW RECTAL AND ANAL CARCINOMA- A SINGLE INSTITUTIONAL EXPERIENCE

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ABSTRACT

BACKGROUND

There are various studies delineating that laparoscopic colonic surgery results in less postoperative pain, rapid recovery, shorter hospital stay, and quick resumption of daily activities when compared to open surgery. But there are only few studies comparing the laparoscopic assisted to open abdominoperineal resection for low rectal or anal canal cancers.

The aim of this study is to evaluate and compare the results of laparoscopic assisted and open abdominoperineal resection (Lap-APR and Open-APR) for low rectal cancer and anal canal cancer.

MATERIALS AND METHODS

Between 1st October 2012 to 30th September 2015 at Gujarat Cancer & Research Institute, 82 patients underwent surgery for low rectal adenocarcinoma or anal carcinoma. Among them, 37 patients underwent laparoscopic APR and 45 patients underwent open APR. The operative outcomes and postoperative complications of these two groups were compared.

RESULTS

There were no significant differences between Lap-APR and open-APR in patient's age and tumour stage. Post-operative recovery was better in Lap-APR group, with earlier return of bowel function and early mobilisation more significant. But the operative time was longer in Lap-APR. Perineal wound morbidity was same in both groups, but the abdominal wound infection rate was higher in Open-APR, as Lap-APR with no long laparotomy wounds will only have small Trocar wounds. Two-year survival was nearly same in both groups.

CONCLUSION

Lap-APR has advantages over Open-APR in rapid postoperative recovery of bowel function, early oral intake, and early mobilisation, but Lap-APR has longer operative time. The operating time of laparoscopic APR has also decreased over time.

KEYWORDS

Laparoscopic Abdominoperineal Resection, Open Abdominoperineal Resection.

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BACKGROUND

Abdominoperineal Resection (APR) is the surgical procedure done on patients with distal rectal cancer in which an anterior resection cannot be done to preserve anal sphincter or for anorectal cancer.^{1,2}

APR was first described by Ernest Miles in 1908, and Jacobs was the first who, in 1991 reported the Laparoscopic colectomy. Since then Laparoscopic colorectal surgery is being increasingly practised worldwide.¹

Recently APR was performed in not more than 14% of patients of rectal cancer.³ With laparoscopic technique for

colon and rectum resection, patients have less postoperative pain, shortened postoperative ileus, reduced duration of hospital stay with rapid recovery and quick resumption of normal daily activities.^{4,5} In laparoscopic APR, the magnified view of narrow pelvis facilitates identification of surgical planes and nerves.⁶ The purpose of this study was to evaluate and compare the results of laparoscopic and open abdominoperineal resection for low rectal adenocarcinoma and anal carcinoma, the postoperative recovery, complications.

MATERIALS AND METHODS

This prospective study was done on 82 patients, having low rectal cancer (within 5 cm of anal verge) and anal carcinoma admitted and operated (Laparoscopic APR/Open APR) from 1st October 2012 to 30th September 2015. Of these 82 patients, 37 patients underwent laparoscopic assisted abdominoperineal resection and placed in Lap-APR group, and 45 patients underwent open abdominoperineal resection, and placed in Open-APR group. Five patients were started as LAP but due to severe adhesion they were

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converted into Open, they were also grouped in 'Open' category. Decision about the technique (Lap-APR or Open APR) is made by the operating surgeon with consultation with patients. All patients gave written informed consent preoperatively.

Patients having following criteria were excluded from the study

- Tumour more than 5 cm higher up from anal verge,
- Bulky tumour or locally advanced tumour,
- Patients having multiple cancers or synchronous proximal colonic cancer,
- Patients having ulcerative colitis,
- Patients with distant metastasis,
- Patients having significant comorbidities (MI, DM, renal failure, chronic liver disease),
- Patients presenting with recurrent rectal cancer.

All patients after physical examination underwent preoperative proctoscopy and complete colonoscopy and biopsy of the tumour, abdominal and pelvis ultrasonography and computed tomography to record the size of tumour and involvement of adjacent structures, and to see the secondaries in liver, chest X-Ray to see the lung metastasis. Complete blood count and carcinoembryonic antigen tests were conducted before surgery. Patients with tumour stage T3 and regional lymph node enlargement were offered pre-operative chemoradiotherapy (CCRT). Mechanical bowel preparation was carried out day before surgery with sodium phosphate oral solution. Cefo-sulbactam 1.5 G was administered intravenously at induction of anaesthesia. Urinary bladder was routinely catheterised. All operations were done under general anaesthesia and patients were placed in modified lithotomy position. In a Lap-APR technique, surgeon stands right to the table, monitor and assistant stands left side. For perineal part of operation, surgeon stands/sits in between the leg rest of the table. Pneumoperitoneum is created by open technique and 10 mm trocar is inserted below the umbilicus. Three or four working trocars are inserted under direct vision in the right and left midclavicular line at the level of umbilicus and anterior superior iliac spine. The left lower Trocar is inserted in left lower quadrant at the planned site of colostomy. The sigmoid colon and rectum are mobilised by using medial and lateral approach. Inferior mesenteric artery 1.5 cm above its origin is clipped and divided. The ureter, the hypogastric nerve and the pelvic parasympathetic plexus are preserved. Rectum and whole mesorectum is completely mobilised, the sigmoid colon is transected with linear stapler and the specimen is removed through the perineal wound. An end colostomy is constructed at the left lower trocar site. The perineal wound is closed after placing a drain in the pelvic cavity through a separate stab wound. The Open-APR was performed by midline laparotomy incision, otherwise same as Lap-APR. Operative outcomes were recorded and compared between the two groups.

RESULTS

Eighty-two patients were operated for adenocarcinoma of low rectum. 37 (45.12%) patients were operated by Lap-APR technique, among them 23 (62%) patients were male, and 14 (38%) patients were female. 45 (54.88%) patients were

operated by Open-APR technique, among them 29 (64.45%) patients were male, while 16 (35.5%) patients were female. There were 5 patients who were converted from Lap-APR to Open-APR technique. Most common reason for conversion was dense adhesion in pelvis.

About operative outcomes, the mean operative time was slightly longer in Lap-APR (175 minutes), while in Open-APR it is 155 minutes. The time to pass first bowel movement was significantly less in Lap-APR (mean 56.4 hours) while in Open-APR it was 68 hours (mean).

Patients in Lap-APR group started taking water earlier than patients of Open-APR group (41 ± 13.2 hours in Lap-APR 54 ± 12.2 hours in Open-APR), which is statistically significant.

After surgery, patients of Lap-APR group started taking soft diet earlier than Open-APR group (4.6 ± 1.2 days in Lap-APR and 5.5 ± 1.7 days in Open-APR), that is also more significant.

Patients of Lap-APR were mobilised early, 6.9 ± 3.19 days in Lap-APR while 9.2 ± 3.45 days in Open-APR. Postoperative hospital stay was slightly less in Lap-APR than in Open-APR group, 14.8 ± 3.4 days in Lap APR and 16.5 ± 4.8 days in Open-APR. 3 (8%) patients in LAP group developed subacute intestinal obstruction, all of them managed conservatively, while 8 (17%) patients in Open-APR group developed intestinal obstruction in post-operative period, out of which in 3 patients (6%) exploratory laparotomy was done and rest were managed conservatively.

In Open-APR group, 6 patients developed abdominal wound infection, which is significant. 6 males (16.2%) and 3 females (8%) in Lap-APR while 7 males (15.5%) and 5 females (11%) in Open-APR described that their sexual function worsened.

The rate of tumour recurrence was similar in both groups.

Two-year survival was 91.9% in Lap-APR and 91.1% in Open-APR group. Local recurrence occurred in 2 (6.7%) and 3 (6.7%) patients of Lap-APR and open-APR group respectively.

Liver recurrences occurred in 4 (10.8%) patients of Lap-APR and 5 (11.1%) patients of Open-APR.

DISCUSSION

Laparoscopic assisted abdominoperineal resection was first described by the Sackier in 1992. After that many studies have demonstrated the benefits and safety of laparoscopic rectal surgery for rectal cancer. Decanini et al described in their study that Lap-APR can be performed according to oncologic principles with proximal vascular ligation of the inferior mesenteric artery. This study demonstrates that the Lap-APR did not jeopardise patients' oncologic outcome.

Toe-WeiKe et al study described the same oncologic outcome, but some studies reported the risk of port site metastasis in Lap-APR. In this study, no port site metastasis occurred in any patient.⁷

Some studies showed that Lap-APR had better immediate outcomes in terms of fast return of bowel function, early mobilisation and less analgesic requirement, when compared with open surgery for rectal cancer.⁸ This study also shows better results of Lap-APR in terms of faster return of bowel function and shorter postoperative hospital stay duration, when compared to Open-APR. But the mean operative time was longer in Lap-APR, while it is short in Open-APR. Patients

of Lap-APR were more comfortable, and were mobilised early as compared to Open-APR. Other studies also showed better mobilisation results of Lap-APR except longer operative time.^{9,10}

A study by Inomata M et al reveals no significant shortening in the length of hospital stay in Lap-APR.¹¹ Male and female sexual dysfunction after Lap- and Open-APR had no significant differences.

Quah H study shows poorer sexual outcomes in Lap-APR when compared to Open-APR.¹²

A study by Paraskevas et al elicited that sexual function was significantly worse one year after laparoscopic surgery.¹³

Patients in the Lap-APR group with no long abdominal laparotomy incisions except of trocar site, seem to provide early mobilisation and recovery, it also made easier to educate patients for stoma management. It also seems stoma care is easier without long abdominal incision in Lap-APR group. Open-APR cases had two big wounds, one long abdominal laparotomy wound, and a second perineal wound. In this way, APR is different from other colorectal resection, in having a higher complication rate because of the perineal wound. Although the Lap-APR is with no long laparotomy wound, the perineal wound and its related complications might not change by the Lap-APR. In addition to reduced abdominal wall trauma in Lap-APR, the less manipulation of abdominal contents may diminish postoperative adhesions and reduce the rate of incisional hernia. While in Open-APR there is more chance of postoperative adhesions, intestinal obstruction, and incisional hernia.

CONCLUSION

Lap-APR has particular advantages to patients with low rectal cancer, including rapid recovery of bowel function, early oral intake of water, semi-fluid and solid diet, and early education of stoma care. Stoma care is also easy in Lap-APR. Short hospital stay without jeopardising oncologic results is noted in Lap-APR, but at the expense of long operative time and more technically demanding procedure.

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