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Research Article

Transanal Total Mesorectal Excision for Patients with Middle-Low Rectal Cancer Following Neoadjuvant Therapy -

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ABSTRACT

Background: Transanal total Mesorectal Excision (TaTME) combined with traditional laparoscopy might be a promising alternative for locally advanced mid-low rectal cancer. However, some potential complications were recorded and should be evaluated further. The aim of this prospective study was assessment the results of TaTME combined with traditional laparoscopy in treatment of locally advanced mid-low rectal cancer of a single institution.

Methods: Prospective study of patients with mid-low locally advanced rectal cancer who were undergone rectal resection with TaTME technique.

Results: 38 patients including 25 middle and 13 low rectal tumors were undergone elective rectal resection by TaTME from March 2015 to September 2018. Male/female ratio: 25/13. Mean age: 58.2 ± 16.4 and BMI: $24.2 \pm 2.5 \text{ kg/m}^2$. Mean operation duration: 210 ± 42 minutes. Specimen were exteriorized in 23 patients through abdominal incision and 15 via anus. 100% patients had hand sew anastomoses and protective ileostomies. No conversion, no Abdominal Perineal Resection (APR) and no death. One postoperative difficult voiding, two presacral abscess and one totally broken down anastomose. Good Quirke' assessment in 33 patients (87%) and intermediate in 5 patients (13%). Negative distal resection margin: 38 patients (100%). Positive circumferential resection margins: 3 patients (7.9%). Median follow-up time was 12 months. One patient had local recurrence at 18th months and one had liver metastasis at 6th months.

Conclusion: Transanal total mesorectal excision for patients with mid-low locally advanced rectal cancers are safe and efficacious. However, a study with larger number of patients, multicentric are needed to evaluate accurately.

Keywords: Transanal total mesorectal excision; Rectal cancer; Neoadjuvant therapy

INTRODUCTION

Laparoscopic Total Mesorectal Excision (TME) for locally advanced mid-low rectal cancer, especially patients with narrow pelvis, overweight or following neo-adjuvant therapy, is still considered a challenge [1-5].

Besides, Natural Orifice Transanal Endoscopic Surgery (NOTES) in treatment of rectal cancer with satisfactory results was showed its limitation in indication for this difficult population of rectal cancer [6-10].

Transanal Total Mesorectal Excision (TaTME) combined with traditional laparoscopy might be a promising alternative to laparoscopic TME as well as NOTES for locally advanced mid-low rectal cancer [8,11,12]. However, some potential complications were recorded and should be evaluated further [13].

The aim of this prospective study was assessment the results of TaTME combined with traditional laparoscopy in treatment of locally advanced mid-low rectal cancer of a single institution.

MATERIAL AND METHODS

Patients

Prospective study on patients with mid-low locally advanced rectal cancer who were given informed consent for rectal resection via transanal total mesorectal excision and traditional laparoscopy. Hospital ethics committee approval was obtained for this cohort study. All patients were undergone operation at Hue Central Hospital in Vietnam.

Inclusion criteria: Patients with locally advanced mid-low rectal cancers (lower: 3-6 cm from anal verge, middle: more than 6 to 9 cm; T3-4 or N+) were diagnosed based on MRI, abdominal CT scan, rectal endoscopic ultrasonography and clinical examination. The indication for neoadjuvant and adjuvant therapy was following ESMO guidelines [14]. Patients with no distant metastasis, ASA ≤ 3 , have no history of colonic surgery, prostatic surgery and no external sphincter invasion.

Exclusion criteria: Distant metastasis (liver, peritoneum), multiple malignancy discovered intraoperatively. Intestinal obstruction or

perforation during preparation for operation. Patients had clinical complete response following chemoradiotherapy.

Surgical technique

Place 10 mm trocar in the umbilicus to observe the peritoneum. In the absence of peritoneal and hepatic metastases we started firstly TME by transanal approach.

Lone star[®] retractor (Cooper surgical, Trumbull, Connecticut, USA) and then a Covidien hemorrhoidectomy anal dilator was placed, the rectum was sterilized with 10% Betadine solution. A purse-string suture closing rectal lumen was performed one centimeter below the inferior border of tumor with Prolene[®] (Ethicon, Cornelia, Georgia, USA) 2.0. The rectal lumen was sterilized again with betadine 10%. Full thickness of the rectal wall was resected another 1 cm from the purse-string suture, starting at 6 o'clock, then go around the rectum. Using 1 malleable and 1 Langenbeck made it easier to identify dissection plane. The mesorectal excision was continued until the visual ability was limited. A SILS port multiple access port (Covidien Minneapolis) was placed and the TME was proceeded to the peritoneal fold using traditional instruments and harmonic scalpel.

One abdominal gauze impregnated with betadine 10% was placed in perineal space and the abdominal stage was performed with 4 ports including one 10 mm umbilical port, one 10 mm right lower quadrant port, one 5 mm left lower quadrant port and one 5 mm right flank port. Abdominal stage finished when abdominal dissection met previous dissection from the anus. The specimens less than 5 cm were taken out through the anus or through a right lower quadrant incision if more than 5 cm.

Anastomoses were made by hand and protective ileostomy was done.

Intestinal continuity was re-established after 4-6 weeks or after completion of postoperative adjuvant therapy.

Postoperative assessment and analysis

Patients' demography (age, sex, BMI), tumor position, preoperative clinical TNM, postoperative TNM, rate of conversion, rate of APR, duration of operation, intraoperative events, postoperative complications (following Clavien-Dindo classification

[15]), procedure of specimen extraction, Quirke' assessment [16], Circumferential Resection Margin (CRM) assessment, Distal Resection Margin (DRM) assessment, hospital stay were recorded.

Follow-up included late complication, local recurrence, distant recurrence, death.

Patient data are shown as mean (s.d) unless indicated otherwise.

RESULTS

Between March 2015 and September 2018, there were 38 patients underwent elective surgery for rectal resection by transanal total mesorectal excision combined traditional laparoscopy. Male/female ratio was 25/13. Mean age was 58.2 ± 16.4 and BMI was 24.2 ± 2.5 kg/m².

There were 25 middle and 13 low rectal tumors in which 30 patients were received neoadjuvant therapy (7 short-courses and 23 long-courses). Mean diameter of tumors was 5.2 ± 1.5 cm. Clinical TNM stage were detailed in table 1.

Mean operation duration was 210 ± 42 minutes (150-270), in which mean anal stage duration was 72 ± 15 minutes (40- 75).

Specimens were exteriorized through right lower quadrant incision in 23 and 15 via anus. Anastomoses were performed by hands in all patients. All patients had protective ileostomy in right lower quadrant.

There was no conversion, no Abdominal Perineal Resection (APR) and no death.

One post-operative complication grade II, and three post-operative complications grade III were recorded. One patient suffered difficulty in voiding but resolved after 1 month with conservative treatment (grade II). Two presacral abscess discovered by 10th and 14th days (grade III) which was managed by trans-anastomotic drainage and the anastomotic opening was closed after 2 weeks. One anastomosis was totally broken down and pelvis abscess discovered by 12th days (grade III). The patient was re-operated by abdominal open approach and the colon was descended further to redo the anastomose.

The hospital stay was 7 ± 2.4 days (5.5-8.4) (Excluding patients readmitted to hospital due to complications).

Preoperative and postoperative characteristics of tumors were detailed in table 2 and 3, respectively.

Quirke' assessment showed good in 33 patients (87%) and intermediate in 5 patients (13%). Mean Distal Resection Margin (DRM) was 20 ± 5 mm and negative in 38 patients (100%). Circumferential Resection Margins (CRM) were positive in 3 patients (7.9%).

Median follow-up time was 12th months. One patient (2.6%) had local recurrence with invasion to urinary bladder and left

Table 1: Preoperative characteristics of tumors.

cTNM	T3N0M0	T4N0 M0	T3N1M0	T3N2M0	T4N1M0	Total
Middle	8*	0	12	3	2	25
Low	2**	5**	2	1	3	13
Total	10	5	14	4	5	3

*Without neoadjuvant therapy; ** Short-course.

Table 2: Preoperative characteristics of tumors following long-course therapy.

yTNM	T2N0M0	T3N0M0	T2N1M0	T3N1M0	Total
Middle	8	4	3	2	17
Low	1	1	3	1	6
Total	9	5	6	3	23

Table 3: Postoperative characteristics of tumors.

pTNM	T2N0M0	T3N0M0	T4N0M0	T2N1M0	T3N1M0	Total
Middle	10	7	1	5	2	25
Low	2	4	3	3	1	13
Total	12	11	4	8	3	38

ureter at 18 months and was managed by transversal colostomy and left ureterostomy (middle, pT3N1, CRM positive). One had liver metastasis at 6th months (middle, pT3N1, CRM negative).

DISCUSSION

Laparoscopic TME for mid-low locally advanced rectal cancer was always difficult, especially in male patients often having narrow pelvis or overweight patients [1-5]. The difficulty become more severe in patients receiving chemoradiotherapy due to unclear dissection plan [17-21]. The difficulty led to conversion rate from 1.2 to 28% [19], Abdominal Perineal Resection (APR) rate of 11.2% [20] and even 30% of APR were required in study of Akiyoshi [17]. In the other hand, operative duration ranges from 267-284 minutes in these studies in which TME were performed up to down [17-21]. This series without cT2 and having 30 (81.6%) preoperative radiotherapy patients (Table 1) showed the feasibility and efficacy of TaTME technique with conversion rate of 0%, APR rate of 0% and short operative duration (210 ± 42 minutes).

The feasibility of the technique was also demonstrated by the technical relevance. Several studies have shown that there is a low incidence of synchronized peritoneal metastasis or hepatic metastasis undiscovered preoperatively in locally advanced rectal cancers, especially in female patients or large tumors [22-24]. So, an umbilical endoscope was used to observe the peritoneal cavity before performing TaTME in this study. However, there was not any distant metastasis discovered in the process of study. The results of 15 specimen exteriorization through anus showed that the transanal pull-through of specimen less than 5 cm was without any difficulties. And 23 patients with the specimen more than 5 cm exteriorized via an abdominal incision in right lower quadrant (planned for protective ileostomy) was reasonable because of the hardness of specimen and avoiding to injuring the external sphincters. With the help of an anal holder, the distal margin of rectal was seen clearly, and the hand-sew anastomosis was performed without any difficulties in all cases in this study.

The results also showed the effectiveness of the TaTME technique for surgical outcomes and oncologic safety.

This study recorded one patient with post-operative difficulty in voiding considered as minor complication (grade II). This problem was resolved after one month by conservative treatment. This complication was also met in other studies [25,26] and was mostly restored with conservative treatment.

This study recorded also two presacral abscesses considered as

major complications (grade III). The complication was managed by trans-anastomotic drainage and the anastomotic opening was closed 2 weeks later. Velthuis met this complication with the rate of 20% and bacterial contamination was suspected as a cause [27,28]. But, we didn't meet this complication in our NOTES series [6] in which most of cases were in early stage. So, Bacterial contamination combined radiation causing ischemia was susceptible cause, following the authors.

One breakdown anastomosis with pelvis abscess (major complication) had late symptoms (10th days). Following the authors, this complication was suspected secondary to a presacral and pelvis abscess. With 3 (7.8%) complications related to presacral abscess in this study and 20% in Velthuis' study, this complication should be required a special attention in TaTME technique for locally advanced rectal cancer. The definitive result of three above complications showed that protective ileostomy played an important role in reducing the severity of complication and to prevent patients from suffering of definitive stoma.

In term of oncologic safety, Quirke' assessment showed 33(87%) good and 5 (13%) inter-mediate specimens in this study. Good specimen assessment was only 72.4% in laparoscopic TME of Kang S.B [21]. Mean distal margin in this study was 20 ± 5 mm, shorter than other studies [8,11,12], but the oncologic safety was satisfied.

Although pTNM stage II-III was 30 patients (68.4%) (Table 3), 100% DRM were negative and one (2.6%) CRM was positive in this study. These results were similar in comparison with other studies [8,11,12].

One patient with middle cancer, pT3N1 and CRM (+) had local recurrent at 18th months, and one patient had liver metastasis at 6th months, although strictly followed by adjuvant chemotherapy. This rate was not higher than other studies [29,30].

CONCLUSION

Transanal total mesorectal excision for patients with mid-low locally advanced rectal cancers are safe and efficacious. However, a study with larger number of patients, multicentric are needed to evaluate accurately.

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