Transanal total mesorectal excision for patients with middle-low rectal cancer in locally advanced stage

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Abstract

Introduction: Patients with middle-low rectal cancer in advanced stage had many difficulties in performing laparoscopic total mesorectal excision (TME), especially in those with narrow pelvis or obese with or without neoadjuvant therapy. We conducted the study of transanal TME (TaTME) for these patients to evaluate the safety and efficacity of this technique.

Material and Methods: Prospective study. Patients with middle-low rectal cancer in advanced stage underwent rectal resection with TaTME technique were enrolled.

Results: 38 patients including 25 middle and 13 low rectal tumors underwent 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 ±2.5 kg/m^2.

Mean operation duration:210 ± 42 minutes. Specimen were removed through abdominal incision in 23 patients and 15 via anus. Anastomoses were performed by hands in 100% patients. The protective ileostomie was performed 100%.

One left ureteral burning and postoperative difficulty in voiding, one presacral abscess due to anastomotic fistula and one totally leakage of the anastomose.

Good Quirke assessment in 87% patients. The distal resection margins (DRM) was 20 ± 5 mm. Distal resection margins (DRM) were negative in 100% patients and circumferential resection margins (CRM) were positive in one (2.6%) patients. The hospital stay was 6 days.

Median follow-up time was 12 months. One patient had local recurrence at 18th months and 1 had liver metastasis at 6th months.

Conclusion: TaTME for patients with middle-low rectal cancer in advanced stage is safe and efficacious. However, there is a need for large, multicentric studies to accurately evaluate this technique.

Introduction

Total mesorectal excision (TME) is the gold-standard approach for rectal cancers with 65% rates of 5 years survival and 6–10% rates of local recurrence [1,2]. Laparoscopic TME was proven to be safe with short and long-term results comparable to open TME [3,4].

However, in patients with middle-low rectal

cancer, especially patients with narrow pelvis, overweight or after neo-adjuvanr therapy, laparoscopic TME is still considered a challenge. Several studies reported that macroscopic quality of TME specimen assessed completely was only 72.4%, the rate of APR was 11.2 % [5] or even 30%[6] and the rate of conversion to open procedure was 28% [5,7].

With the increasing of number of patients suffering from middle-low rectal cancer following neoadjuvant therapy as recommended by NCCN, requiring a new strategy to minimize the shortcomings of laparoscopic TME [8].

Transanal TME (TaTME) "open" was reported by Bannon et al in 1995 and in 2010, Sylla P. reported the first case of Transanal TME "laparoscopy". Since then, transanal TME has become increasingly accepted [9,10].

It was found that patients with middle-low rectal cancers following neo-adjuvant chemoradiotherapy had many difficulties in performing laparoscopic TME, especially in those with narrow pelvis or obese. We conducted the study of TaTME for patients with middle-low rectal cancer following neo-adjuvant chemoradiotherapy to evaluate the safety and efficacity of this technique.

Materials and method

Patient selection:

Selected patients with middle-low rectal cancer who gave informed consent for rectal resection via transanal total mesorectal excision technique were included. Hospital ethics committee approval was obtained for this cohort study. All underwent operation at Hue Central Hospital in Vietnam.

Patient selection criteria included: Patients with middle-low rectal cancer (lower: 3-6 cm from anal verge, middle: more than 6 to 9 cm), T3-4. The diagnosis was based on MRI, abdominal CT scan, rectal endoscopic ultrasonography and clinical examination. Patients with tumor T3, having a clear margin of circumferential resection margin (CRM) on MRI, received short-course radiation therapy (5Gy×5f), surgery after one week. Patients with tumor T3 without clear margin of CRM, or positive nodules, or T4, received long-course chemoradiotherapy (50.4Gy×28 and 5FU+Oxiliplatin), surgery after 6-8 weeks [7]. Patients with no distant metastasis, ASA ≤ 3, have no history of colonic surgery, prostatic surgery and no external sphincter invasion.

Exclusion criteria who had a synchronous distant metastasis, multiple malignancy discovered intraoperative. Some complications such as bowel obstruction or perforation after received for study.

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 Vicryl® (Ethicon, Cornelia, Georgia, USA) 2.0. 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.

With open technique, mesorectal excision was performed until the ability to observe by "open" surgery was limited. If the upper margin of the tumor was overcome a few centimeters, we stopped and moved to the abdomen stage.

In cases of the tumors were not overcome, a SILS port multiple access port (Covidien Minneapolis) was placed and the TME was proceeded until the peritoneal fold using traditional instruments and harmonic scalpel.

The operative specimens were taken out through the anus if the tumor less than 4 cm or through a lower right quadrant incision.

Abdominal stage was performed with 4 ports. And anastomoses were made by hand.

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

Postoperative assessment and analysis

Patient demography included age, BMI.

Tumor position, preoperative clinical TNM, postoperative TNM were noted.

Rate of conversion, rate of APR, duration of operation, intraoperative events and post-operative complications, procedure of specimen extraction, Quirke assessment[11], circumferential resection margin (CRM) assessment, distal resection margin (DRM) assessment, hospital stay were recorded.

Follow-up included late complication, local recurrence, distance 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 middle-low rectal cancer by transanal total mesorectal excision. Male/female ratio was 1,9: 1. Mean age was 58.2 ± 16.4 and BMI was 24.2 ± 2.5 kg/m^2.

There were 25 middle and 13 low rectal tumors in which 28 patients were followed neoadjuvant therapy (5 short-courses and 23 long-courses). Mean diameter of tumors was 5.2±1.5 cm. Clinical TNM stage were detailed in table 1.

Table 1: Preoperative characteristics of tumors

Charac-teristics	T3(CRM-)	T3 (CRM+)	T3N1	T3N2	T4N1	Total
Middle	8	0	12	3	2	25
Low	2	5	2	1	3	13
Total	10	5	14	4	5	38

TaTME "open" was performed in 25 patients and TaTME "laparoscopy" in 13 patients.

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

Specimen 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 and APR.

There was no death. One patient had 1/3 superior left ureter intraoperative burn which was managed with JJ catheter placement. This patient then suffered the difficulty in voiding but resolved after 1 month with conservative treatment.

Postoperative complications included 1 presacral abscess due to anastomotic fistula detected by 10th days managed by transanal drainage and the anastomotic opening was sutured after 2 weeks. The other was totally necrosis of 4 cm distal colon and the anastomose discovered by 12thdays. The patient was re-operated by abdominal approach, the colon was descending for the anastomose again.

The hospital stay was 6 days (5-8).

Postoperative characteristics of tumors were detailed in table 2

Table 2: Postoperative characteristics of tumors

Characteristics	T3(CRM-)	T3(CRM+)	T2N1	T2N0	Total
Middle	15	1	7	2	25
Low	10	0	2	1	13
Total	25	1	9	3	38

Anatomo-pathology assessment showed good Quirke assessment in 33 patients (87%) and intermediate 5 patients (13%) (Figure 1). The distance from lower pole of tumor to distal resection margins (DRM) was 20 ± 5 mm (Figure 2). Distal resection margins (DRM) were negative in 38 patients (100%) and circumferential resection margins (CRM) were positive in 35 patients (92%).

Figure 1: Macroscopic aspect of TaTME specimen showed good assessment

Figure 2: Intralumen aspect of TaTME specimen showed safe distal margin

Median follow-up time was 12th months. One patient (2.6%) had local recurrence and invaded to urinary bladder and left ureter at 18 months and was managed by transversal colostomy and left ureterostomy. One had liver metastasis at 6th months. Both were middle rectal cancer with T3N2, in which one had CRM (+).

Discussions

With the results above, we found that TaTME technique was effective for middle-low rectal cancer in locally advanced stage.

As we learned performing laparoscopic TME in patients with middle-low rectal cancer always difficult, especially in male patients often having narrow pelvis or obese patients [12,13,14]. More difficulties in patients have received chemo-radiotherapy due to unclear dissection plan. The conversion rate ranged from 1.2 to 28% [5,6,7], and in study of Akiyoshi [6], 30% of APR were required. In the other hand, operative duration ranges from 267-284 minutes in these studies in which TME were performed up to down [5,6,7]. Our series showed the conversion rate of 0%, APR rate of 0% and the operative duration was shorter (210 ± 42 minutes) compared with previous studies.

Besides, after radiotherapy, the rectal wall near the tumor became harder making it difficult to identify the lower border of the tumor for placing endo GIA. In some cases, TME by laparoscopy up-to down was almost impossible. In these cases, if the attempt to do so would break the tumor or lead to APR [14,15,16]. We noted that TaTME making easier retraction of the rectum in abdominal stage and the inferior border of rectal tumor being accurately identified by TaTME technique helped overcome the disadvantages.

These results showed that TaTME "open" was feasible and effective. "Laparoscopy" technique was used only in 13/25 middle rectal cancers and there were no urethral as well as posterior vaginal wall injuries which were reported in several studies [10,17,18]. Indeed, in term of technique, we did not have difficulty in performing TME from the anus. The dissection plane was identified clearly although the tumors were big and even followed neoadjuvant therapy.

Should a laparoscope be used to observe the peritoneal cavity before performing TaTME? Several studies have shown that there is a low incidence of synchronized peritoneal metastasis in locally advanced rectal cancers, especially in female patients or large tumors [19,20,21].

There were 15 tumors under 4 cm taken through the anus. However, after this study, we found that the mesenteric remains and selection of colonic resection site in this group was not as good as that

of the patients whom specimens were taken out through lower right quadrant incisions.

Ureteral lesion due to burn in abdominal stage was not quite unrelated to TaTME technique. Difficulty in voiding met in one patient in this study. This complication was also met in other studies and was mostly restored with conservative treatment [22,23,24,25,26].

Presacral abscesses due to anastomotic leakage met in the TaTME technique at a rate of 1,2% and are usually well resolved by transanal approach. This complication occurred in one patient in this study [22,23,24,25,26].

Distal part necrosis of the colon that came down for the anastomose in this study was serious. The symptoms appeared late (10^{th}days), so that we suspected of atherosclerosis or marginal vessels lesions in the process of pulling the specimen out through the anus.

Result of two anastomotic complications showed that protective ileostomy plays an important role in reducing the severity of complications and to prevent patients from suffering of definitive stomy.

In term of oncologic safety, this study showed 87% specimens good and 13 inter-mediate in Quirkeassessment. This assessment was only 72.4% good in laparoscopic TME of Kang S.B [5]. Mean distal margin in this study was 20 ± 5 mm, shorter than other studies [10,22,23,24,25,26]. However, the distal resection margin in this study satisfied the oncologic safety.

DRM was negative in 100% cases and there was one (2.6%) positive in CRM in this study. These results were similar in comparison with other studies [22,23,24,25,26].

One patient with cT3N2 and postoperative CRM (+) had local recurrent at 18^{th} months, and one patient had liver metastasis at 6^{th} months, although strictly followed by adjuvant chemotherapy. This rate was not higher than other studies [27]. This study and several other studies [27,28] showed the importance of CRM as well as TaTME.

Conclusions

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

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