

Transanal endoscopic microsurgery (TEM) for early rectal cancer: single center experience

Transanalinė endoskopinė mikrochirurgija ankstyvam tiesiosios žarnos vėžiui gydyti

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Background / objective

To evaluate the initial experience with transanal endoscopic microsurgery (TEM) for early rectal cancer in a single center.

Patients and methods

From February 2010 to October 2012 a total of 16 patients underwent TEM for early rectal cancer. 7 were women and 9 men, age range 52 to 88 years (median – 71 years). Postoperative surveillance protocol, which includes rigid proctoscopy, CEA and endorectal ultrasound every 3 months during first two years, was applied to all patients after TEM.

Results

Final histology revealed 10 (62.5%) lesions to be T1 and 6 (37.5%) T2 cancers. There were no postoperative complications. All 6 patients in pT2 group and those in pT1 group with unfavorable histology were offered adjuvant chemoradiotherapy or immediate radical surgery. Patients were followed up from 1 to 27 months (median – 14 months). There was one local recurrence (6.25%) in a patient who refused to undergo abdominoperineal excision for T1 low rectal cancer, had unfavorable histology after TEM, for which reason underwent postoperative chemoradiation. The patient had abdominoperineal resection 7 months after TEM (rpT2N0M0). One patient was lost to follow-up. The rest of the patients are alive and disease-free.

Conclusions

In our hands, TEM was an alternative to standard total mesorectal excision in patients with low risk early rectal cancer. Further follow-up is necessary to evaluate recurrence and survival rates after TEM for patients with invasive rectal cancer.

Key words: early rectal cancer, transanal endoscopic microsurgery, recurrence, survival

Darbo tikslas

Įvertinti pradinę patirtį naudojant transanalinę endoskopinę mikrochirurgiją (TEM) ankstyvajam tiesiosios žarnos vėžiui gydyti.

Ligoniai ir metodai

Nuo 2010 m. vasario iki 2012 m. spalio 16 pacientų, sergančių ankstyvuju tiesiosios žarnos vėžiu, buvo gydyti TEM būdu (7 vyrai ir 9 moterys, amžius – nuo 52 iki 88 metų; mediana – 71 metai). Visiems pacientams buvo atliekama pooperacinė stebėseną: proktoskopija, endorektalinė sonoskopija ir CEA tyrimas kas 3 mėn. pirmus dvejus metus.

Rezultatai

Histologinio tyrimo metu rasta 10 (62,5 %) T1 navikų ir 6 (37,5 %) T2 navikai. Artimųjų pooperacinių komplikacijų nebuvo. Visiems šešioms pT2 grupės pacientams ir pT1 didelės rizikos pacientams buvo pasiūlyta adjuvantinė chemoradioterapija ar skubus radikalus operacinis gydymas. Pacientai buvo stebimi nuo 1 iki 27 mėn. (mediana – 14 mėn.). Vienam pacientui (6,25 %), atsisakiusiam abdominoperinealinės rezekcijos dėl žemo didelės rizikos T1 naviko, po chemospindulinio gydymo navikas atsinaujino. Po 7 mėn. šiam pacientui buvo atlikta abdominoperinealinė rezekcija (rpT2N0M0). Vienas pacientas pasitikrinti neatvyko. Kiti pacientai yra gyvi, jiems nėra recidyvo.

Išvados

TEM yra alternatyvus gydymo metodas tradicinei totalinei mezorektalinei ekscizijai (TME) pacientams, sergantiems mažos rizikos tiesiosios žarnos vėžiu. Tolesnė stebėseną reikalinga siekiant įvertinti recidyvų dažnį ir išgyvenamumą po TEM esant invazyviam tiesiosios žarnos vėžiui.

Reikšminiai žodžiai: ankstyvas tiesiosios žarnos vėžys, gydymas, transanalinė endoskopinė mikrochirurgija.

Introduction

Transanal endoscopic microsurgery (TEM) was devised in animal model by Gerhard Bues in 1983 as an alternative to transanal excision (TAE) [1]. The use of TEM is increasing due to the ability to perform minimally invasive local treatment with large full-thickness local excision under improved vision. It has a well established role in removal of rectal adenomas [2-4], but its purpose in local treatment of early rectal cancer is yet to be defined. TEM is comparable to radical resection in terms of recurrence but with far less morbidity and mortality in favourable T1 tumours [5-7]. The requirement of costly equipment and difficult tumour selection remain the major drawbacks of this method, although it has to be weighed against improved functional outcomes and quality of life compared to radical resection [6, 8]. The aim of this study was to evaluate single center experience with TEM for early rectal cancer (it was defined as T1-T2 rectal cancer without any nodal involvement (N0)).

Patients and methods

From 2010 02 19 to 2012 10 29 a total of 16 patients (Table 1) underwent TEM for early rectal cancer. 7 were women and 9 men, age range 52 to 88 years (median – 71 years). Rectal lesions were from 10 to 30 mm in diameter (median 26 mm). 7 (43.7%) tumors were located in the lower third of rectum, 8 (50%) in the middle third and 1 (6.3%) in the upper third. All pa-

tients underwent pelvic MRI and endorectal ultrasound, as well as abdominal ultrasound and chest X-ray preoperatively.

All patients operated for rectal adenocarcinoma were offered TEM as an alternative to open total mesorectal excision (TME). Selection criteria for TEM were well or moderately differentiated T1 rectal cancer without any nodal involvement (N0) and no histological signs of poor prognosis on preoperative biopsy. Two patients (88-year-old patient (case Nr. 7) and 82-year-old (case Nr. 16)) were found to have T2N1 rectal cancer on MRI – due to refusal of radical resection and presence of significant co-morbidities TEM was performed.

All operations were performed under general anesthesia, in lithotomy, prone jack-knife, left lateral or right lateral position (depending on the exact location of the tumor). Standard TEM equipment was used. Full thickness excision with 1 cm safety margin was attempted, followed by closing of the rectal wall defect in one-layer running monocryl 3-0 suture using silver clips. In one case (TEM was performed for T2 rectal cancer), abdominal cavity was penetrated and two-layer closure was preferred.

One patient (case Nr. 10) with pT1 rectal cancer had co-existing stage II G3 peripheral lung cancer, which was treated by lower left lobectomy and chemoradiotherapy in 2010.

Postoperative surveillance protocol, which includes rigid proctoscopy and endorectal ultrasound every

Table 1. Patient characteristics

No	Age, years; gender	Location in the rectum	Size of tumor, mm	Pathological T stage	Histological grading, other features	Length of stay, days	Adjuvant chemoradiotherapy	Follow-up, months	Outcome
1	75; M	Middle 1/3	30	pT2	G2	4	Yes	17	Alive, disease free
2	60; F	Upper 1/3	10	pT1	G2	5	No	27	Alive, disease free after immediate partial TME
3	67; M	Lower 1/3	30	pT2	G2	10	Yes	22	Alive, disease free
4	64; F	Middle 1/3	20	pT1	G1	6	No	23	Alive, disease free
5	67; F	Middle 1/3	12	pT2	G2	4	Yes	21	Alive, disease free
6	52; M	Middle 1/3	25	pT1	G1, lymphovascular invasion	3	Lost to follow-up	N/A	Lost to follow up
7	88; M	Middle 1/3	17	pT2	G2	9	Refused	16	Alive, disease free
8	82; M	Lower 1/3	29	pT1	G2, lymphovascular invasion	4	Yes	14	Alive, local recurrence, underwent salvage APR
9	70; M	Lower 1/3	30	pT1	G2	2	No	17	Alive, disease free
10	69; M	Lower 1/3	28	pT1	G2	5	No	12	Alive, disease free
11	79; F	Middle 1/3	N/A	pT1	G2	3	No	7	Alive, disease free
12	88; F	Middle 1/3	N/A	pT1	G2	6	No	7	Alive, disease free
13	72; M	Lower 1/3	27	pT2	G1	3	Yes	4	Alive, disease free, after immediate APR
14	78; F	Lower 1/3	14	pT1	G2	9	No	3	Alive, disease free
15	60; F	Middle 1/3	30	pT1	G2	9	No	1	Alive, disease free
16	82; M	Lower 1/3	22	pT2	G2	15		1	Alive, disease free

M – male, F - female

3 months during first two years, was applied to all patients after TEM.

Results

Final histology revealed 10 (62.5%) lesions to be T1 and 6 (37.5%) T2 cancers. 3 (18.8%) tumors were well differentiated (G1), the remaining 13 (81.2%) – moderately differentiated (G2). In all 16 cases resection margins were adequate and disease-free. Operative time ranged from 30 to 300 minutes (median – 72.5 minutes). Median length of stay was 5 days (range 2–15 days).

Postoperative recovery was uneventful in all cases. One patient in pT1 group (case Nr. 2) underwent TEM for upper 1/3 polyp which was understaged preoperatively as *carcinoma in situ*, open partial TME was

proposed and performed; no residual tumor or positive lymph nodes were detected postoperatively. In two cases from pT1 group (case Nr. 6 and Nr. 8) lymphovascular invasion was present on final pathology – both patients were sent for postoperative adjuvant chemoradiotherapy (long course radiotherapy with 5 FU based chemotherapy). One of them (case No. 6) was lost to follow up.

All 6 patients in pT2 group were offered adjuvant chemoradiotherapy or immediate radical surgery. A 88 year old male (case Nr. 7) refused any other therapy or surveillance. 3 patients (cases Nr. 1, 3, 5) were treated with adjuvant chemoradiotherapy. Case Nr. 13 underwent immediate abdominoperineal resection - no residual tumor or positive lymph nodes were detected postoperatively.

Patients were followed up from 1 to 27 months (median – 14 months). One patient (case Nr. 6) was lost for follow-up. There was one local recurrence (6.25%) in a patient (case Nr. 8), who refused to undergo abdominoperineal excision for T1 low rectal cancer, had unfavorable histology after TEM, for which reason underwent postoperative chemoradiation. The patient had abdominoperineal resection 7 months after TEM (rpT2N0M0). The rest of the patients are alive and disease-free.

Discussion

The management of early rectal cancer aims to offer cure while minimizing the morbidity and mortality of the treatment. Total mesorectal excision is a gold standard today for rectal cancer treatment in terms of local control, prevention of distal spread and long-term survival, but may result in permanent stoma and a significant chance of sexual or urinary dysfunction (up to 40%), anastomotic leakage (5-10%) and long-term functional bowel disturbance [9]. TEM may offer the opportunity of cure with less detriment.

Standard TEM equipment was used in our series. However, to overcome high costs, a 'glove port' and standard laparoscopic instruments can be utilized [10, 11].

There was one perforation to abdominal cavity, which was closed with double layer suture. No complications were detected afterwards – this is in agreement with Morino et al. [12], who in their recent study report no influence of peritoneal perforation during TEM short-term or oncologic outcomes.

The successful treatment of rectal carcinoma by TEM depends on careful patient selection. Correct staging by imaging is crucial to define patient eligibility: MRI is useful to assess the nodal disease [13], whereas endorectal ultrasound scan has a sensitivity of > 80% and a specificity of > 90% for T-staging [14]. Nevertheless, endorectal ultrasound is a very user dependent method and can result in inaccurately staged rectal cancer (up to 44.8% of tumors as reported in study based on UK TEM database [15]).

Accepted low-risk criteria of T1 rectal carcinoma suitable for local treatment are well or moderately differentiated lesion, slight carcinoma invasion of the

muscularis mucosa (sm1), smaller than 3 cm in diameter, less than 40 % wall circumference and no sign of lymphovascular invasion^[5, 16, 17]. In the study, based on international multicentre TEM registry, Bach et al.^[18] define three histopathological variables, which independently predicts local recurrence-free survival: depth of tumor invasion (a composite of pT and Sm category), maximum tumor diameter and presence of intramural lymphovascular invasion.

The surgical margin status has a significant influence on the successful treatment: R1, Rx, R < or = 1 mm or high-risk T1 rectal tumors increases the local recurrence rate from 6 to 39 percent. However, immediate radical surgery after non-radical local excision of rectal pT1 carcinoma reduces the recurrence rate to 6 percent [19].

As for transanal excision in pT2 lesions, local therapy alone is related with high risk of local recurrence: overall recurrence rates (including patients who did and did not have chemoradiation) range from 6% to 18%^[20]. Our strategy in current series was not to leave a single patient without further treatment if pT2 cancer was found in final histology.

Lezoche et al. [21] compared endoluminal locoregional resection by TEM to laparoscopic TME for T2 rectal cancer after chemoradiotherapy. They concluded that the probability of developing recurrence or metastases and cancer-related survival rate was similar in both groups. However, short-term results significantly favored TEM in terms of operating time, stoma rate, blood loss and transfusions, need for analgesia and hospital stay.

Ongoing trials (local excision versus TME in downstaged T2/T3 low rectal cancer after radiochemotherapy; neoadjuvant chemoradiation and local excision for uT2uN0) will help to answer the question concerning the treatment of higher rectal cancer stages by the local technique after neoadjuvant therapy [22].

Conclusions

In our hands, TEM was an alternative to standard total mesorectal excision in patients with low risk early rectal cancer. Further follow-up is necessary to evaluate recurrence and survival rates after TEM for patients with invasive rectal cancer.

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