

# Removal of gallstone from mesorectum after laparoscopic cholecystectomy – new indication for transanal endoscopic microsurgery technique

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## Abstract

*Transanal endoscopic microsurgery (TEM) is a minimally invasive technique for local excision of benign and malignant neoplasms in the rectum. Indications for this technique are constantly changing and extending. The aim of this study is to describe a case of a unique and innovative application of this surgical technique. A 72-year-old patient was admitted to the Clinical Department of General and Colorectal Surgery for elective resection of a tumor located in the perianal area using the TEM surgical technique. In August 2005 the patient underwent laparoscopic cholecystectomy due to symptomatic cholecystitis. From March 2011 the patient complained about ongoing sharp pain in the perianal and presacral area. Computed tomography revealed two oval areas approximately 30 mm in size to the right of the sigmoido-rectal region communicating with the colon lumen. Subsequently diverticulitis was diagnosed. The TEM technique was uniquely used to successfully remove the gallstone from the 72-year-old patient's presacral area.*

**Key words:** transanal endoscopic microsurgery, transanal endoscopic microsurgery, gallstone.

## Introduction

Gerhard Buess, a German surgeon, introduced transanal endoscopic microsurgery (TEM) technique in collaboration with Dr Richard Wolf in 1984 [1]. At that time, the main indication for TEM technique was excision of large rectal polyps, impossible to remove during the customary endoscopic polypectomy. For the last two decades application of TEM has significantly expanded due to more advanced technologies, broadening of medical knowledge about rectal cancer and its development, and significant experience gained by the surgeons [2]. Despite the fact that studies present many indications to perform TEM, still the most common indication is the excision of large adenomas, which were otherwise practically impossible

to remove during colonoscopy. Another indication is the excision of carefully selected rectal cancers with low grade of risk (T1sm1) [3, 4]. It is necessary to perform preoperative staging (clinical examination, computed tomography (CT), magnetic resonance imaging (MRI), rectoscopy with specimen sampling for histopathologic examination and transrectal ultrasonography) to determine which patients with malignant neoplasms are suitable for surgery in TEM technique. Several studies by De Graaf, Morino, Nair, Sgourakis *et al.* revealed significant oncologic and surgical benefits for patients with T1 and T2 rectal cancers after neoadjuvant radiochemotherapy and TEM operation in comparison with total mesorectal excision [5–8].

Apart from curative indications, many studies present application of TEM in patients for palliative

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reasons such as advanced, large tumors, T3 and T4, with metastasis to mesorectum or distant metastasis. Yet authors agree that this approach is controversial and it should not be applied as a routine. Transanal endoscopic microsurgery is also clinically useful for patients who refuse radical excisions or for those who, according to prevailing medical opinion, are poor candidates for abdominal surgery [9].

Local excision is routinely performed in small (less than 3 cm), well to moderately differentiated T1 tumors located up to 8 cm from the anal verge and comprising less than 30% of the rectal wall circumference with no evidence of nodal involvement. These indications allow full-thickness excision with a 3-mm negative margin [10].

Transanal endoscopic microsurgery is successfully used in the treatment of fistulous disease such as high anorectal fistulas (suprasphincteric or extrasphincteric), rectourethral and rectovaginal fistulas [11, 12]. Some studies also describe application of TEM in the treatment of anastomotic strictures (stricturoplasty) or the correction of rectal prolapse (fixation of the posterior wall of the rectum to the presacral tissue) [13, 14]. Some authors consider TEM as an effective technique in excision of rectal stumps, perianal tumors or pelvic abscesses [15, 16].

## Case report

In 2013 a 72-year-old female patient was admitted to the Clinical Department of General and Colorectal Surgery for elective resection of a tumor located in the perianal area with the TEM technique. The patient had an extraordinary medical record with no clear concluding diagnosis. In August 2005 the patient had laparoscopic cholecystectomy due to symptomatic cholecystitis. The surgery was not performed in our hospital. The postoperative course was reported as uncomplicated and the patient was discharged. However, 3 years later, in 2008, the patient complained about consistent, sharp, abdominal pain which was not accompanied by fever, nausea or vomiting. Improper food intake was also ruled out as a potential source of consistent abdominal pain. The patient was subsequently hospitalized several times in gastroenterology wards with no clear diagnosis. It was suspected that symptoms were connected with diverticular disease, hemorrhoids or gastroenteritis. From March 2011 the patient additionally complained about consistent pain within the lower part of the rec-

tum. In June 2011 the patient was again hospitalized and underwent computed tomography of the abdomen and pelvis which, apart from diverticular disease, revealed chronic perianal abscesses which were diagnosed as a postinflammatory process after diverticulitis. Laboratory tests were within the normal range. Colonoscopy showed diverticular disease and a 2 mm polyp in the descending colon which was removed and sent for histopathologic examination, which revealed a tiny tubular adenoma with low-grade dysplasia with complete removal. After the hospitalization and the patient's discharge, symptoms were somewhat reduced, but not entirely alleviated.

In November 2011 symptoms again intensified and the diagnostic process needed to be repeated. Computed tomography was repeated and revealed diverticular sigmoid colon with numerous diverticula sized up to 18 mm as well as segmental, irregular thickening of the sigmoid wall and the rectum up to 9 mm. This image was considered to be an inflammatory process rather than a hyperplastic process. Curiously, two oval objects approximately 30 mm in size were identified in the sigmoido-rectal region. They were communicating with the colon lumen and, at first glance, they could be characterized as chronic diverticulitis.

Transanal endosonography showed a tumor located on the posterior rectal wall between 9 and 13 cm from the anal verge. Due to numerous artefacts and an unacceptably high level of discomfort, it was impossible to define the tumor's depth of mucosal invasion. Nevertheless, it was defined as T1/T2 grade tumor. During this round of examination an enlarged lymphatic node was also revealed. Colonoscopy was repeated. There were no apparent changes in the rectum. In the anal canal there were small hemorrhoids. The sigmoid colon (20 cm from the anal verge) exhibited diverticulum with surrounding intense mucosa redness and edema accompanied by slight bleeding from its bottom. In the entire colon, especially in the proximity of the sigmoid and descending colon, there were multiple diverticula and many of them were filled with fecal masses. In the transverse colon, 70 cm from the anal verge, there was a tiny 2 mm round polyp which was completely removed (tiny tubular adenoma with low-grade dysplasia removed completely). Tumor markers were within the normal range: CA-19.9 < 0.600 U/ml, CEA 2.52 ng/ml.

The patient was qualified for surgery using the TEM technique for the removal of the tumor from the

retrorectal space. Transanal endoscopic microsurgery was performed in the gynecological position. The *per rectum* examination showed hard, oval, 3 cm long resistance of the posterior wall of the rectum, 8 cm from the anal verge. Initially, after using the rectoscope attachment, the performing surgeon visualized the rectum and sigmoid colon for a distance of up to 20 cm from the anal verge and observed no apparent pathologic changes. However, during instrument retraction, we observed partial deformation of the posterior wall, which constituted evidence of a tumor just beyond the rectal wall. In the first stage of the surgery the mucosa was incised transversally above the tumor. During mesorectum preparation with the ThermoStapler sealing system the surgeon found an object resembling a 3 cm gallstone in the presacral area and removed it. During the preparation, the peritoneal wall was slightly opened, causing a gradual increase of the pneumoperitoneum. A 10 mm trocar was inserted into the left lower part of the abdomen. Laparoscopic inspection of the peritoneal cavity did not reveal any damage to adjacent internal organs. An incision in the peritoneum was sutured and carbon dioxide leakage was stopped. The trocar was removed and replaced with a Redon drain. The aperture in the rectal wall was closed with sutures. The patient's postoperative course was uneventful. On the third day after surgery the drain was removed and the 72-year-old patient was discharged after five days. Approximately a month after surgery, the patient's wound was healed and all symptoms subsided.

After the surgery the removed object was submitted for histopathologic examination. Its results confirmed that it was a gallstone. The chemical analysis yielded a makeup of: cholesterol 75%, bile acid 0%, oxalates 10%, calcium 10%, phosphorus 5%, magnesium 0%, ammonia 0%, cystine 0%.

## Discussion

Leaving a gallstone in the peritoneum does not necessarily constitute a clinically serious or life-threatening situation. On the basis of a literature review (6 studies, 18 280 laparoscopic cholecystectomies) Woodfield *et al.* estimated the frequency of gallbladder perforation as 18.3% and gallstone spillage as 7.3%. Complications occur in 2.3% of cases, and incidence increased to 7.0% when spilt gallstones were documented [17]. Due to that low frequency, leaving gallstones is often overlooked in

diagnostic procedures, and it takes time until the patient is finally successfully diagnosed.

Complications connected with leaving gallstones are more frequent in cases of patients with several risk factors, such as older age, male sex, acute cholecystitis, spillage of pigment stones, number of stones (> 15) or size of the stone ( $\emptyset > 1.5$  cm), perihepatic localization of lost stones or rupture of the gallbladder during retrieval via the umbilical port [18, 19]. In our patient the gallbladder had a thin wall, was not inflamed and contained large gallstones.

Complications could occur many months or years after surgery. The longest described case occurred 17 years after laparoscopic cholecystectomy [20]. In a retrospective review the median and mean times from surgery to symptom appearance were 3 months (range: 0–78) and 5.5 months, respectively. However, it took a further 4.5–4.8 months until the final diagnosis was made and definitive treatment was implemented [18]. Our patient had her first symptoms 3 years after primary surgery and was diagnosed after 8 years.

The most common complications are intra- and retroperitoneal abscesses, external fistulas and fistulas communicating with internal organs (small intestine, colon and urinary tract) [21–23]. In the literature there were several cases described where gallstones translocated through the diaphragm into the chest cavity or into the groin hernia sac [24, 25]. It can also cause local or systemic septic complications [26].

Nevertheless, we have not found any articles about gallstones in the mesorectum. We think that because there was no inflammatory process in the gallbladder, lost gallstones did not induce inflammation or other septic complications. The length of time from primary operation to symptom appearance is a reason for late diagnosis, because spilt gallstones are not considered to be a potential cause. Although imaging can reveal the presence of fistulas or abscesses, gallstones are not always discovered. Although it is only a case report, it is a great example of how to use TEM in suspicion of tumors of unknown origin and type located in the rectum and also beyond the rectal wall. This technique is very helpful in diagnostics and surgical treatment. It allows perfect vision when imaging is insufficient. Such surgical innovation could help to broaden the indications for TEM in the future.

## Conclusions

It is essential to remove spilled gallstones during a cholecystectomy, and check the peritoneal cavity thoroughly after removing the gallbladder, especially when the gallbladder is ruptured. Unfortunately, there is no agreement whether gallstone spillage should be a reason to perform open surgery, as opposed to laparoscopic surgery. Transanal endoscopic microsurgery is an attractive option due to its enhanced visibility, superior optics, and longer reach that allow precise excision. Indications for TEM constantly change on the basis of the latest studies, so it is essential to modify them and search for new ones in accordance with current knowledge and personal experience. We have proved that it might be a useful tool in diagnostics and surgical treatment in the case of pathologies located in the pelvis, beyond the rectum.

## Conflict of interest

The authors declare no conflict of interest.

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