



Case Report

Retroperitoneal abscess after transanal minimally invasive surgery: case report and review of literature[☆]



Aaron Raney^b, Shankar Raman^{a,*}

^a Mercy Surgical Affiliates, Des Moines, United States

^b Des Moines University, Des Moines, United States

ARTICLE INFO

Article history:

Received 2 April 2017

Accepted 19 June 2017

Available online 8 August 2017

Keywords:

Colorectal surgery

Transanal minimally invasive surgery (TAMIS)

Retroperitoneal abscess

Natural orifice transluminal endoscopic surgery (NOTES)

Single-site laparoscopic surgery (SILS)

Surgical oncology

ABSTRACT

Abscesses are a rare complication of transanal minimally invasive surgery and transanal endoscopic micro surgery. Reported cases have been in the rectal and pre-sacral areas and have been managed with either antibiotics alone or in conjunction with laparotomy and diverting colostomy. We report a case of a large retroperitoneal abscess following a Transanal minimally invasive surgery full thickness rectal polyp excision. The patient was successfully managed conservatively with antibiotics and a percutaneous drain. Retroperitoneal infection should be included in a differential diagnosis following a Transanal minimally invasive surgery procedure as the presentation can be insidious and timely intervention is needed to prevent further morbidity.

© 2017 Sociedade Brasileira de Coloproctologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Abscesso retroperitoneal após cirurgia de ressecção transanal minimamente invasiva: relato de caso clínico e revisão a literatura médica

RESUMO

Os abscessos são uma complicação rara da cirurgia de ressecção transanal minimamente invasiva (TAMIS) e da micro cirurgia endoscópica transanal (TEMS). Os casos notificados foram nas áreas rectal e pré-sacral e foram administrados com antibióticos isoladamente ou em conjunto com laparotomia e desvio de colostomia. Relatamos um caso de grande abscesso retroperitoneal após uma excisão de pólipos retal de espessura total TAMIS.

Palavras-chave:

Cirurgia colorretal

Cirurgia de ressecção transanal minimamente invasiva (TAMIS)

Abscesso retroperitoneal

[☆] Paper developed at Mercy Medical Center, Department of Surgery, Des Moines, United States.

* Corresponding author.

E-mail: SRaman108@gmail.com (S. Raman).

<http://dx.doi.org/10.1016/j.jcol.2017.06.007>

2237-9363/© 2017 Sociedade Brasileira de Coloproctologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Cirurgia endoscópica
transluminal de orifício natural
(NOTES)
Cirurgia laparoscópica de único
local (SILS)
Oncologia cirúrgica

O paciente foi tratado com sucesso com a administração de antibióticos e drenagem percutânea. Para prevenir mais morbidade é necessária incluir a infecção retroperitoneal no diagnóstico diferencial após um procedimento TAMIS onde a apresentação pode ser insidiosa e a intervenção atempada.

© 2017 Sociedade Brasileira de Coloproctologia. Publicado por Elsevier Editora Ltda. Este é um artigo Open Access sob uma licença CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Transanal minimally invasive surgery (TAMIS) is a recently developed surgical approach first described in 2010 by Atallah et al.¹ It is a form of natural orifice transluminal endoscopic surgery (NOTES) that is an alternative to the previously developed transanal endoscopic micro surgery (TEMS) technology. In contrast to TEMS, TAMIS utilizes ordinary laparoscopic instruments instead of TEMS specific instruments. Though there have been no extensive comparative studies, TAMIS platform has been quickly adopted due to decreased upfront cost, readily accessible instruments, and faster learning curve.^{1,2} A single-incision laparoscopic surgery (SILS) port, adapted for transanal use (SILS™ Port, Covidien, Dublin, Ireland) or a specific transanal platform (GelPOINT® Path Transanal Access Platform, Applied Medical, Rancho Santa Margarita, CA, USA), is placed and secured in the anus.¹ Standard laparoscopic instruments are then placed through this port and allow for conventional laparoscopic dissection.² Pneumorectum allows for adequate visualization and the shorter TAMIS platform provides advantageous working angles within the rectum as well as circumferential dissection without patient re-positioning.^{2,3} Furthermore, the soft platform has the theoretical advantage of better functional outcomes due to less traction on the anal wall.²

TAMIS has proven to be an effective platform for R0 local resection of benign neoplasia and early rectal cancer.² Reported procedure specific complications have been primarily bleeding, peritoneal entry, and rectal abscess.^{3–5} The true incidence of post-TAMIS abscesses is not well known and there has not been a large retroperitoneal abscess documented. We report a case of an extensive retroperitoneal abscess formation following a TAMIS procedure without peritoneal entry. This was managed nonoperatively with antibiotics, and percutaneous drainage.

Case presentation

A 62-year old male, with a history of colonic polyps, underwent a colonoscopy where he was noted to have a large rectal polyp located in the left posterolateral position, starting just above the level of the dentate line and measuring 4 cm × 3 cm, extending cranially to just above the level of the anorectal ring (Fig. 1). His medical history was significant for well-controlled diabetes mellitus type II, (HemoglobinA1c – 5.7%), hypertension, and nephrolithiasis. On digital rectal exam, this felt as a soft fleshy polyp located about 3–4 cm from the anal verge. Pre-operative biopsies showed tubulovillous

adenoma and MRI and endorectal ultrasound indicated possible T2N0 lesion. In view of these findings, the patient underwent TAMIS with full thickness excision of the polyp. He received preoperative mechanical bowel prep with PEG-3350 (Braintree Laboratories Inc, Braintree, MA, USA) without oral antibiotics. 1 g of Ertapenem was given IV as antibiotic prophylaxis, 15 min before start of the procedure. The patient was placed in the left lateral position and pneumorectum was established up to 15 mmHg using CO₂ insufflator (Stryker, Kalamazoo, MI, USA). The wound was closed with 2-0 V-LoC™ wound closure device (Covidien, Dublin, Ireland) on both the anterior and posterior aspects, leaving the central most portion open to avoid excessive tension. Operating time was 94 min and the procedure was uneventful. There was no intraoperative contamination of the operative site. There was no entry into the peritoneal cavity as this was a low-lying lesion. Final pathologic results showed a tubulovillous adenoma 3.7 cm × 3.2 cm in dimension with focal high-grade dysplasia and negative margins. The patient tolerated the procedure well and was discharged on the first post-operative day.

On postoperative day five, he presented to the emergency room with worsening left lower quadrant abdominal pain radiating to his back. He had no rectal pain. A non-contrast CT scan of his abdomen and pelvis, performed due to history of nephrolithiasis, showed inflammatory stranding as well as extraluminal air in the pelvis and left lower quadrant without any focally drainable fluid collections. The patient was afebrile and hemodynamically stable without leukocytosis or lactic acidosis. Bowel rest and empiric antibiotics were initiated. Blood cultures were negative. The patient's pain improved and his white count remained normal. However, he developed low-grade fevers. Therefore, a CT scan with contrast was repeated 48 h after re-admission (post-operative day seven). It demonstrated increased emphysematous collections. Extraluminal gas was located adjacent to the medial aspect of the descending colon. Additional gas was seen in the retroperitoneum, anterior to the left psoas muscle and extending caudally and medially into the pre-sacral region and adjacent to the rectum on the left. There was no free peritoneal air. There was also new fluid associated with the air adjacent to the psoas with the greatest collection measuring 10 cm × 4.1 cm transaxially and 9 cm craniocaudally (Fig. 2). Due to progression of infectious process, antibiotics were escalated. The retroperitoneal fluid collection was drained by CT-guided percutaneous placement of 12-French pigtail anterior to the left psoas and returned air and cloudy fluid. Drain cultures grew moderate growth of *Escherichia coli* and *Pseudomonas aeruginosa*, light growth of *Bacteroides thetaiotaomicron*, and rare growth of *Enterococcus* species. Antibiotics were adjusted to

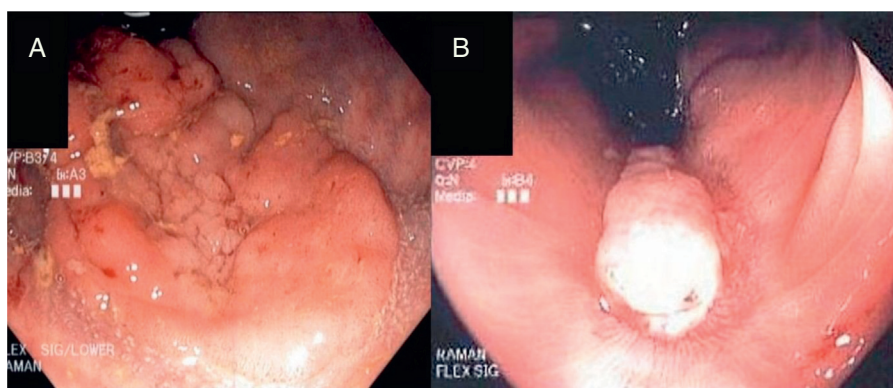


Fig. 1 – Pre-operative flexible sigmoidoscopy showing left posterolateral 4 cm × 3 cm polyp (A) and follow-up flexible sigmoidoscopy five months post-operatively demonstrating healed posterior rectal mucosa (B).

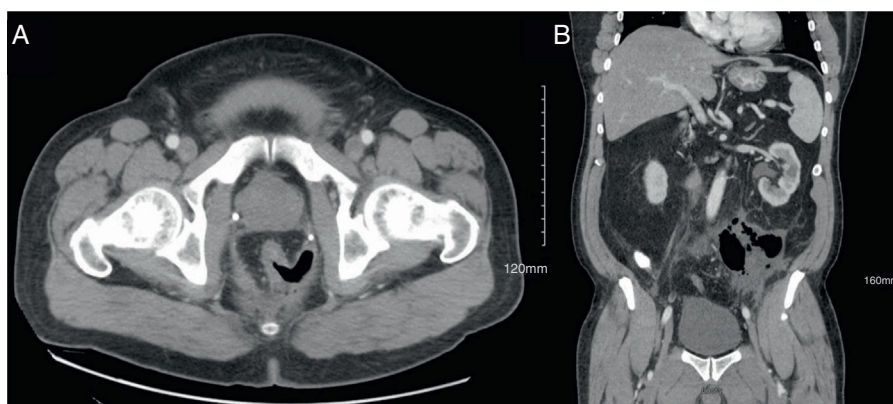


Fig. 2 – CT scan on post-operative day seven demonstrating communication of the rectal defect with the peri-rectal aspect of the abscess (A) and extent of left retroperitoneal emphysema and abscess (B).

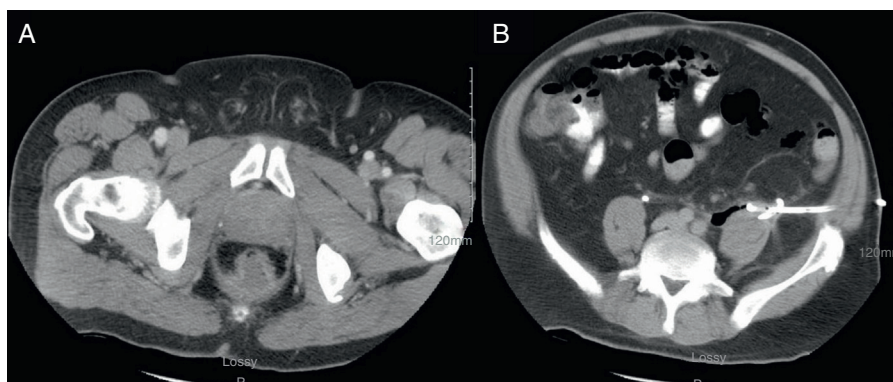


Fig. 3 – CT scan 15 days (post-operative day 22) after CT guided percutaneous drain placement demonstrating resolved peri-rectal (A) and retroperitoneal abscesses (B).

levofloxacin and metronidazole in response to cultures. The patient improved clinically as drain output slowed. He developed persistent urinary retention that required discharge with Foley catheter. Diet was advanced and the patient was discharged five days after drain placement. Follow-up drain study five days later showed significant improvement of communicating retroperitoneal, presacral, and perirectal abscess areas with the perirectal abscess draining via the portion of rectum operatively left open (Fig. 3). The drain was removed 15 days

after placement with minimal ongoing output and the patient made a complete recovery.

Flexible sigmoidoscopy five months after the procedure showed that rectal mucosa had healed completely (Fig. 1). An inflammatory polyp was seen and biopsied at the site of previous TAMIS full-thickness excision, pathology confirmed benign etiology. At the time of writing, 16 months after TAMIS, patient is doing well without any evidence of recurrence.

Table 1 – Literature review of abscess locations following TAMIS and TAMIS related procedures and management of abscess complications.

Authors	Date	Procedure	Abscess location (incidence)	Management
Gill et al. ⁴	2015	TAMIS	Rectal abscess (1 of 32, 3%)	Diverting Hartmann procedure
Bignell et al. ¹⁰	2010	TEMS	Pre-sacral abscess (7 of 262, 3%)	Two managed conservatively with antibiotics alone. Five required diverting stoma due to lack of resolution on antibiotics alone.
Bretagnol et al. ¹¹	2007	TEMS	Pre-sacral abscess (1 of 200, 0.5%) Intra-abdominal abscess (3 of 200, 1.5%)	Laparotomy for drainage and temporary colostomy. Two patients required laparotomy and drainage, one managed conservatively with antibiotics and nothing by mouth.

TAMIS, transanal minimally invasive surgery; TEMS, transanal endoscopic microsurgery.

Discussion

Retroperitoneal abscesses are a rare clinical occurrence and often are insidious in nature. For these reasons, they can be difficult to diagnose, leading to treatment delay.⁶ The most frequent presentation is a combination of fever, lumbar or abdominal pain, and a lumbar mass, though they can also present with nonspecific symptoms such as malaise, abdominal discomfort, and weight loss.^{6,7} Laboratory evaluation usually shows leukocytosis as well as the potential for anemia, pyuria, and elevated creatinine.⁶ Diagnosis can be made by ultrasound or CT. Retroperitoneal abscesses arise by invasion from adjacent structures including renal infections, lumbar osteomyelitis, pancreatitis, colon carcinoma, diverticulitis, Crohn's disease, and appendicitis.⁷ Microorganisms isolated from these abscesses most often grow gram negative bacilli.⁶ Once an abscess is identified, early treatment by drainage and intravenous antibiotics is needed.

Our patient presented without leukocytosis, lactic acidosis or significant fever. His predominant symptom was back and flank pain. This further highlights the insidious presentation of retroperitoneal abscesses. While our patient did have a history of renal calculi and a CT scan showing a left non-obstructing renal calculus, the retroperitoneal abscess was due to full thickness excision of rectal polyp. Culture results and abscess tracking from the surgical site support this conclusion.

Following the advent of the TAMIS technology there have been various documented cases of abscess complications following the TAMIS procedure. These abscesses have been in either the peri-rectal, pre-sacral or pelvic areas (Table 1). This case is unique in that patient developed a large pre-sacral and peri-rectal abscess that extended along left psoas muscle in the retroperitoneum to the level of the left colon. This probably occurred due to intraoperative seeding of bacteria aided

by dissection into the retroperitoneum from carbon dioxide insufflation.

Extension of infection from the anal region into the retroperitoneum has been well documented. The most similar comparison is that of a case study of retroperitoneal sepsis following a stapled transanal rectal resection (STARR).⁸ However, while the STARR procedure does involve full thickness rectal wall resection, the use of a stapler, closure of the full-thickness defect and the non-endoscopic nature of the procedure make it far different from the TAMIS procedure. Although rare, retroperitoneal sepsis or abscess can also originate from anorectal infections that invade beyond puborectalis and rupture into one of the supralelevator spaces.^{7,9} In a large series of 262 patients who underwent TEMS, presence of the rectal lesion less than 2 cm from the dentate line was associated with higher incidence of pelvic sepsis. Pelvic sepsis developed in 4/62 patients with low-lying lesions as compared to 1/200 patients with high lying lesions ($p < 0.02$). Interestingly, there was no statistical association between closure of the defect and incidence of pelvic sepsis. Also, most patients with pelvic sepsis were managed with diverting colostomy.¹⁰

As interventional radiology (IR) technology and skill has advanced, it has replaced the need for surgical drainage in all but the most complex cases. Percutaneous drainage must be carefully planned to avoid critical anatomy. Generally, retroperitoneal abscess management strategies include conservative treatment with antibiotics alone, interventional radiology guided percutaneous drains, versus traditional surgical exploration and drain placement.^{6,8} Within the context of post-operative bowel anastomosis or wall closure, the need for protective colostomy should be evaluated and considered. Furthermore, the need for rectal resection may be necessitated if the degree of infection is sufficiently injurious.

Small retroperitoneal abscesses (less than 3 cm in diameter) in a hemodynamically stable patient may be effectively treated with an extended course of antibiotics alone.⁶

However, larger abscesses or un-resolving smaller abscesses must be drained either by percutaneous drain placement or by surgical exploration and drainage. Surgery offers several advantages over IR drainage including the ability to fully explore the anatomy and extent of the infection as well as the ability to remove fistulous tracts.⁶ However, surgery does carry more significant risks, delays, and morbidity. Resolution and recurrence are similar between the surgical and IR approaches.⁶

Previous rectal and pre-sacral abscess complications of TAMIS and TEMS for local excisions have been managed with antibiotics alone or in combination with laparotomy and diverting colostomy (Table 1). Our patient's large retroperitoneal abscess was managed with percutaneous CT guided drain placement and antibiotics. We were able to avoid a colostomy or loop ileostomy in spite of the presence of extensive retroperitoneal inflammation and abscess formation extending from the low rectum up to the left psoas as the patient did not have sepsis or generalized peritonitis. Our practice has been to manage complicated diverticulitis with abscess formation with CT guided drainage, due to the availability of skilled interventional radiologists. We applied those principles to manage the current patient, controlling the infectious process with percutaneous drainage. If this was infeasible or unsuccessful, surgical intervention would be indicated. Whether leaving the site of TAMIS open contributed to the postoperative retroperitoneal infection and abscess formation is arbitrary as the literature does not show closure prevents complications or leaving the site open causes complications. Closure is essential to prevent intraperitoneal contamination when the peritoneal cavity is entered. When there is no entry into the peritoneal cavity, closing the defect has no obvious advantages. In a large multicenter retrospective study of 75 patients undergoing TAMIS, the defect was not closed in 35 patients. There was no significant difference in incidence of complications between the two groups.¹² Interestingly, in another study of patients undergoing transanal excision and TAMIS, a higher number of postoperative complications of all grades were noted in patients where the defect was closed.¹³

Conclusion

Our case report demonstrates a complication that is unique to full-thickness excision of rectal lesions. Following TAMIS, patients can present with symptoms that are distant from the site of surgery. Retroperitoneal infection should be

considered in the differential diagnosis. Timely intervention is of paramount importance in preventing further morbidity from infection.

Conflicts of interest

The authors declare no conflicts of interest.

REFERENCES

1. Atallah S, Albert M, Larach S. Transanal minimally invasive surgery: a giant leap forward. *Surg Endosc*. 2010;24:2200–5.
2. Quaresima S, Balla A, Franceschilli L, La Torre M, Iafrate C, Shalaby M, et al. Transanal minimally invasive surgery for rectal lesions. *J Soc Laparoendosc Surg*. 2016;20, e2016.00032.
3. Martin-Perez B, Andrade-Ribeiro G, Hunter L, Atallah S. A systematic review of transanal minimally invasive surgery (TAMIS) from 2010 to 2013. *Tech Coloproctol*. 2014;18:775–88.
4. Gill S, Stetler J, Patel A, Shaffer V, Srinivasan J, Staley C, et al. Transanal minimally invasive surgery (TAMIS): standardizing a reproducible procedure. *J Gastrointest Surg*. 2015;19:1528–36.
5. Keller D, Tahilramani R, Flores-Gonzalez J, Mahmood A, Haas E. Transanal minimally invasive surgery: review of indications and outcomes from 75 consecutive patients. *J Am Coll Surg*. 2016;222:814–22.
6. Manjón C, Sánchez A, Piedra Lara J, Silva V, Betriu G, Peñalver C, et al. Retroperitoneal abscesses – analysis of a series of 66 cases. *Scand J Urol Nephrol*. 2003;37:139–44.
7. Okuda K, Oshima Y, Saito K, Uesaka T, Terasaki Y, Kasai H, et al. Midline extraperitoneal approach for bilateral widespread retroperitoneal abscess originating from anorectal infection. *Int J Surg Case Rep*. 2016;19:4–7.
8. Stolfi V, Micossi C, Sileri P, Venza M, Gaspari A. Retroperitoneal sepsis with mediastinal and subcutaneous emphysema complicating stapled transanal rectal resection (STARR). *Tech Coloproctol*. 2009;13:69–71.
9. Zaveri J, Nathani R, Mathure A. Ano-rectal abscess with retro-peritoneal spread (a case report). *J Postgrad Med*. 1987;33:97–8.
10. Bignell M, Ramwell A, Evans J, Dastur N, Simson J. Complications of transanal endoscopic microsurgery (TEMS): a prospective audit. *Colorectal Dis*. 2010;12:99–103.
11. Bretagnol F, Merrie A, George B, Warren BF, Mortensen NJ. Local excision of rectal tumours by transanal endoscopic microsurgery. *Br J Surg*. 2007;94:627–33.
12. Hahnloser D, Cantero R, Salgado G, Dindo D, Rega D, Delrio P. Transanal minimal invasive surgery for rectal lesions: should the defect be closed? *Colorectal Dis*. 2015;17:397–402.
13. Noura S, Ohue M, Miyoshi N, Yasui M. Significance of defect closure following transanal local full-thickness excision of rectal malignant tumors. *Mol Clin Oncol*. 2016;5:449–54.