Techniques in Coloproctology (2019) 23:387–390
https://doi.org/10.1007/s10151-019-01941-y

TRICK OF THE TRADE

Utilising taTME and robotics to reduce R1 risk in locally advanced rectal cancer with rectovaginal and cervical involvement

B. Teoh[1] · P. S. Waters[1] · O. Peacock[1] · P. Smart[2] · K. Reid[2] · A. Rajkumar[2] · A. G. Heriot[1,2] · S. K. Warrier[1,2,3]

Received: 17 December 2018 / Accepted: 31 January 2019 / Published online: 16 February 2019

Introduction

Over the last decade, there has been increasing recognition and use of transanal total mesorectal excision (taTME) as a safe and reliable method for resection of mid to low rectal malignancies [1]. The technique has been adopted in a structured and safe manner in Australasia [2]. Structured accreditation pathways for robotic colorectal competence also exist worldwide [3]. There is little in the literature describing the utilisation of these minimally invasive surgical (MIS) techniques for locally advanced rectal cancer. The authors present a novel application of taTME in the "beyond TME" era [4] to achieve an R0 resection to aid a posterior vaginectomy, with robotic assisted ultralow anterior resection, en bloc total hysterectomy and bilateral salpingo-oophorectomy, retrieved transvaginally, in a patient with locally advanced rectal cancer.

Case history

A 44-year-old otherwise well female presented with a new diagnosis of rectal adenocarcinoma (mismatch repair (MMR) proficient) 5 cm from the anal verge. This was staged as T4bN2Mx on magnetic resonance imaging (MRI), with invasion into the mesorectal fascia at 12 o'clock into the posterior uterine cervix and suspected extramural vascular invasion and involvement of the rectovaginal septum (Fig. 1a, b). No distant disease was identified on positron emission tomography(PET)-computed tomography (CT) scan. She subsequently had neoadjuvant long course chemoradiation therapy. A restaging MRI scan indicated a partial response to therapy.

This case was reviewed in a multidisciplinary meeting, with recommendation for an en bloc resection. Preoperatively the patient was reviewed by a gynaecologic oncologist, and she had appropriate counselling regarding future fecundity and postmenopausal symptoms.

Technique

The operating team was organised for a two-team procedure ("Cecil" approach), and included colorectal and gynaecological surgeons. Preoperatively, the patient had standard bowel preparation. General anaesthetic was given and prophylactic antibiotics were administered at induction. The patient was prepared and placed in the Lloyd Davies position.

The transabdominal approach commenced with Optiport™ (Ethicon Endosurgery, Cincinnati, OH, USA) entry used in the standard manner. Abdominal ports were placed and robotic arms were positioned for a routine low anterior resection with the da Vinci® Si Surgical System (Intuitive Surgical, Sunnyvale, CA, USA). The taTME approach was also set up synchronously (Fig. 2). The perineum was prepared and draped with betadine. A Lonestar® retractor (Cooper Surgical, Trumbull, CT, USA) was used to retract the anoderm layer. The GelPOINT® Path Transanal Access Platform (Applied Medical, Santa Margarita, CA, USA) was inserted using sponge forceps and position was confirmed using the dilator. A 1-0 Prolene suture with 26 mm rounded needle was used to create a purse string to close the rectum distal to the lesion, ensuring equal proportions of tissue were taken at equidistance from the port lip in clockwise fashion. Three ports were inserted via the platform with utilisation of an Olympus 0-degree camera. Using the AirSeal device

B. Teoh and P. S. Waters: co-first authors.

✉ S. K. Warrier
satish96101@yahoo.com

[1] Division of Cancer Surgery, Victorian Comprehensive Cancer Centre, Melbourne, Australia

[2] Epworth Freemasons Hospital, Melbourne, Australia

[3] Division of Cancer Surgery, Peter MacCallum Cancer Centre, 305 Grattan Street, Melbourne, VIC 3000, Australia

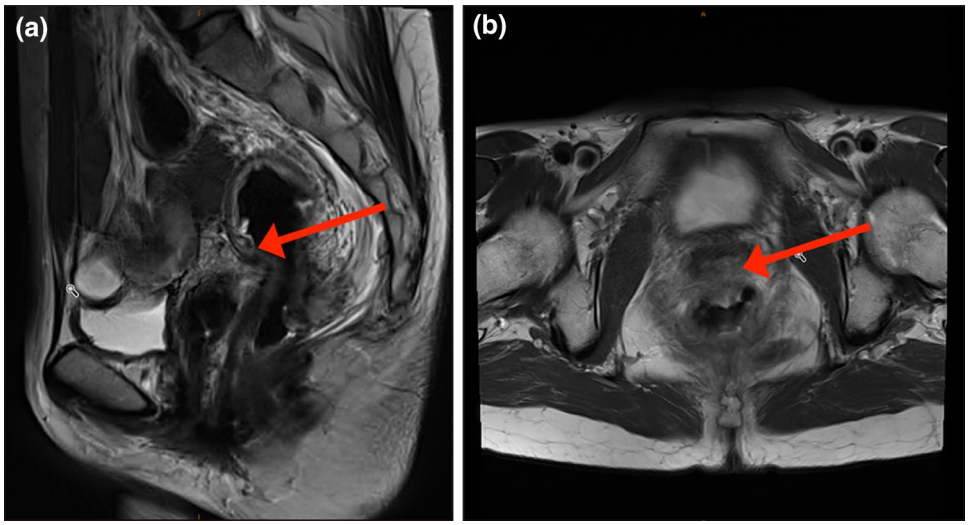

Fig. 1 Sagittal (**a**) and axial (**b**) MRI slices of the patient showing the rectal adenocarcinoma invading through the mesorectal fascia into the posterior cervix and rectovaginal septum as indicated by red arrows

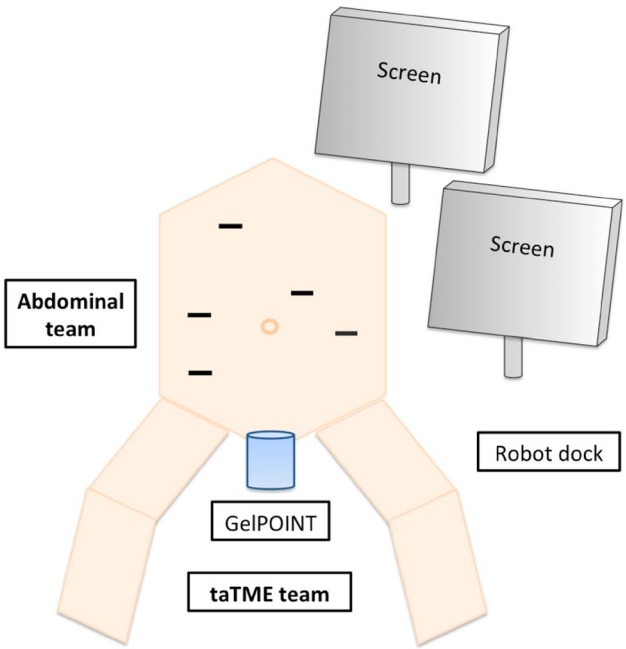

Fig. 2 "Cecil" approach with taTME—set up of patient, equipment and surgical teams

(CONMED, Utica, NY, USA) at a pressure of 5 mmHg, a planned circumferential mucosal mark was created with hook diathermy at the edge of the circumferential longitudinal mucosal lines. This was then followed by full thickness circumferential rectotomy at this point through mucosal and muscle layers (Fig. 3a). Sharp down-to-up dissection was started following the "holy plane", avoiding a cone shape to ensure completeness of the mesorectum. Pressure from the AirSeal was increased to 12 mmHg and the camera switched to a 30-degree laparoscope. Following circumferential identification of the endopelvic fascia, the extra-fascial TME plane was identified and dissected posteriorly. Denonvilliers' inferior margin is poorly described; however, the anterior condensation was pushed posteriorly so that the anterior dissection was anterior to this plane along the posterior vaginal wall. This edge is best seen transanally.

Whilst a complete rectotomy was performed from below, the colon was completely mobilised from the splenic flexure to the sigmoid region laparoscopically. The inferior mesenteric artery and inferior mesenteric vein were taken proximally with Hem-o-lok® clips (Weck Closure Systems, Research Triangle Park, NC, USA).

Bilateral ureterolysis and en bloc total hysterectomy with bilateral salpingo-oophorectomy was then performed robotically via the transabdominal approach (Fig. 3b, c). Simultaneously, the posterior vagina was transected transanally via taTME approach, hence controlling the potential for an R1 resection at this area. The standard triangle and zeros described for maintenance of correct planes was not respected when performing this extra-anatomical dissection. Synchronous dissection with direct communication from both primary operators concentrating on the same pelvic quadrant was used to complete the dissection through the peritoneum and TME plane (Fig. 3d). The rectum was removed transvaginally through an Alexis® wound protector (Applied Medical, Santa Margarita, CA, USA), en bloc with the uterus, cervix, bilateral fallopian tubes and ovaries and posterior vagina (Fig. 3e). The sigmoid colon was divided laparoscopically and also extracted through the vaginal opening.

Formation of a colonic J-pouch was followed by repair of the vagina with handsewn sutures both transvaginally and robotically. A J-pouch anal anastomosis was performed and oversewn with a 3-0 polydioxanone (PDS) suture, and this was inspected for adequate vascularisation and haemostasis. Finally, a defunctioning loop ileostomy was fashioned.

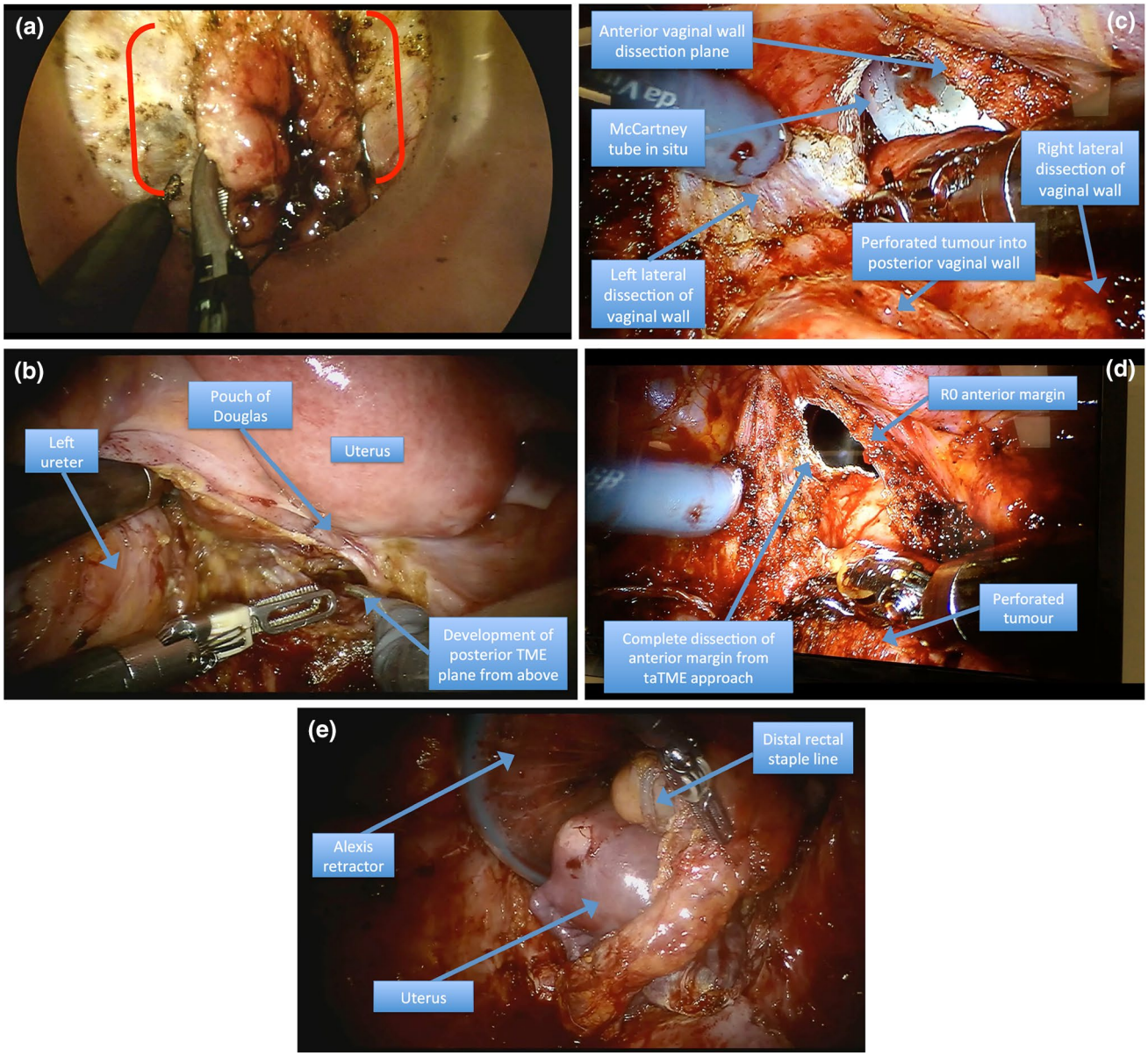

Fig. 3 **a** Circumferential rectotomy with hook diathermy to aid access into endopelvic fascia and retrograde TME dissection—rectotomy plane highlighted in red; **b** Cecil approach from above—medial to lateral dissection with development of posterior TME plane from above with protection of left ureter; **c** transanal resection of posterior vaginal wall with robotic transection of anterior vaginal wall to prevent R1 resection margin of anteriorly perforated rectal tumour into posterior vagina; **d** completion of anterior dissection plane from transabdominal and transanal approaches with macroscopic R0 margin; **e** transvaginal oncological extraction with Alexis retractor of en bloc rectum, cervix, uterus with bilateral ovaries and fallopian tubes with posterior vagina, not requiring any dedicated abdominal assist incisions

A rectal tube was placed in situ to reduce intraluminal pressure for the first 24 h and transverse abdominis plane (TAP) blocks were given. No further abdominal incisions were made apart from the ileostomy trephine.

Outcome

The patient had an uncomplicated admission and was discharged 5 days postoperatively. Histopathology showed ypT3N0Mx moderately differentiated adenocarcinoma of the rectum with local invasion at least to the pararectal tissue,

lympovascular invasion, 17 lymph nodes all negative and clear margins. One month later the patient commenced adjuvant chemotherapy with folinic acid, fluorouracil and oxaliplatin (FOLFOX), followed by an uneventful loop ileostomy reversal 2 months later.

Discussion

To our knowledge, this is the first article describing the utilisation of the taTME technique to facilitate a posterior vaginectomy for a locally advanced rectal cancer and transvaginal extraction.

Meticulous dissection and identification of tissue planes is paramount in taTME, to ensure not only the R0 resection but also avoidance of potential complications such as urethral or nerve injury. Female patients are at risk of posterior vaginal wall injury especially if they have undergone preoperative radiation [5]. Abdominal and transanal teams must be able to work synchronously using the Cecil approach. In our case, specific care was taken to safely excise the involved posterior vagina, which required a high level of coordination and communication between the teams.

This case highlights the importance of having specialised surgeons involved in the adoption of new technology in advanced cases. The senior surgeons (SW, AH) are high volume exenterative surgeons (> 50 cases per year) and proctors for both taTME and high volume robotic surgery in Australasia. It also represents an incremental refinement in the combined skillset that is required for advanced application of the techniques. The authors recommend that for cases involving similar high-level clinical and technical complexity, such an approach should only be considered at specialist centres with a coordinated team of surgeons who have the appropriate specialised level of experience.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethics approval All procedures performed in the study were performed in accordance with expected ethical standards and conform to the 1964 Helsinki declaration and its subsequent amendments.

Informed consent Informed consent was obtained from all individual participants in the study.

References

1. Westwood DA, Cuda TJ, Hamilton AER, Clark D, Stevenson ARL (2018) Transanal total mesorectal excision for rectal cancer:state of the art. Tech Coloproctol 22(9):649–655. https://doi.org/10.1007/s10151-018-1844-8
2. Abbott SC, Stevenson ARL, Bell SW et al (2017) An assessment of an Australasian pathway for the introduction of transanal total mesorectal excision (taTME). Colorect Dis 20:O1–O6
3. Bell S, Carne P, Chin M et al (2015) Establishing a robotic colorectal surgery programme. ANZ J Surg 85:214–216
4. Beyond TME, Collaborative (2013) Consensus statement on the multidisciplinary management of patients with recurrent and primary rectal cancer beyond total mesorectal excision planes. Br J Surg 100(8):E1–E33
5. Atallah S, Albert M, Monson JRT (2016) Critical concepts and important anatomic landmarks encountered during transanal total mesorectal excision (taTME): toward the mastery of a new operation for rectal cancer surgery. Tech Coloproctol 20(7):483–494. https://doi.org/10.1007/s10151-016-1475-x