Double single-port pan-proctocolectomy with transanal total mesorectal excision [TaTME] and ileal pouch-anal anastomosis [IPAA]: improvisation under limited resources

Pramodh Chandrasinghe, Sumudu Kumarage
Department of Surgery, The Faculty of Medicine, University of Kelaniya, Sri Lanka

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Abstract

Introduction
Novel surgical techniques fail to reach all parts of the world equally due to financial constraints. Non-availability of high-cost equipment in the developing world hinders progress. Transanal total mesorectal incision [TaTME] is a novel technique becoming popular world over due to many perceived benefits. Some of the equipment requirements prevent surgeons in resource-limited environments from taking up this technique. We describe the performance of a double single port panproctocolectomy with TaTME and ileal pouch-anal anastomosis for a patient with colitis-associated rectal cancer under improvised conditions at a tertiary care centre in Sri Lanka. Standard practice requires two laparoscopic stacks and an integrated air insufflator both of which are not available in the local setting. A flexible endoscope was used to replace the need for a second laparoscopic stack and a simple drainage bag connection to the standard insufflator to provide a stable pneumoperitoneum. The patient had a rapid uneventful recovery.

Introduction
Transanal mesorectal excision [TaTME] is a technique that has been well accepted by colorectal surgeons due to the improved access it provides to the deep pelvis [1]. Apart from better access, this technique is associated with other perceived benefits such as a well-controlled rectotomy and a double purse-string stapled anastomosis, which theoretically lowers the risk of leakage in low rectal anastomoses [2]. The double single port technique uses a single port device at the proposed ileostomy site in the right iliac fossa [RIF] for the abdominal dissection and a transanal port device for the 'bottom-up' dissection in the mesorectal plane. The reduced access trauma in this procedure is associated with better outcome[3].

The double single port technique requires the use of two separate laparoscopic stacks for either side for two surgeons to operate in tandem and to carry out the procedure. Additionally, an integrated CO2 insufflation device with special tubing is required to provide a stable pneumopelvis without bellowing of the rectum [3]. These requirements limit the use of this technique in resource-scarce environments. Here we describe a double single-port restorative proctocolectomy with TaTME performed using a flexible endoscope and an improvised insufflation system to counter the resource limitation.

Methodology
A 70-year-old female was referred by the gastroenterologist with colitis-associated cancer of the upper rectum. She had pancolitis and the cancer was localised to the rectum. Following a multi-disciplinary team discussion, it was decided to proceed with a restorative panproctocolectomy. The patient was placed in Lloyd-Davies position and a GelPoint port [Applied Medical, Rancho Santo Margarita, California] was placed at the proposed ileostomy site in the RIF [Figure 1], and a GelPoint Path [Applied Medical, Rancho Santo Margarita, California] transanally. A flexible endoscope [Fuji EC-760ZP, Fujifilm, Japan] was used in place of a second laparoscopic stack and a 30-degree
grasper the dissection along the TME plane was carried out up to the peritoneal reflection. The abdominal dissection was carried out using the single port at the RIF and one 5mm additional port in the left iliac fossa to complete the total colectomy using a 30° laparoscopic telescope. The two dissection planes of the rectum were met at the peritoneal reflection to complete the rendezvous procedure. The specimen was delivered through the port in the right iliac fossa and divided at the terminal ileum. An ileal pouch was fashioned extra-corporeally and a double purse-string stapled pouch-anal anastomosis was carried out. The port site at the RIF was used for the diverting loop ileostomy. The total operating time was 320 minutes with a blood loss of less than 100 ml. Both surgeons have been formally trained in TaTME at several centres in Europe through mentoring and cadaveric dissection courses.

Postoperative pain control was excellent as the patient only had the ileostomy site and a 5mm drain site [Figure 4]. The patient had an uneventful recovery and was discharged on postoperative day five.

Discussion

Scarcity of resources hindering progress in surgical innovation has been a long-discussed topic [4]. The general non-availability of high-cost surgical instruments has limited surgical innovation to certain parts of the world. This could be countered through innovation and improvisations that allow safe surgery at a low cost. TaTME has proven the comparable outcome in both benign and malignant proctectomies. Use of this technique for restorative surgery in UC has been well
camera allowed excellent visualization not secondary to the laparoscopic view [Figure 5].

The insertion of the scope directly through the gelport instead of a working port gave us high maneuverability and was inspired by similar use during the TASER procedure [7]. Using a single port for abdominal dissection and utilizing the same for specimen extraction helped to prevent an abdominal incision.

The pulsatile movements of the rectum, known as 'bellowing' when using the standard insufflator, is due to the intermittent flow of gas. Countering this effect by connecting a commercially designed reservoir bag to a standard system has been described previously [8]. Connecting an easily accessible sterile drainage bag ['uribag'] between the insufflator and the port provides the same effect and is being used by many colorectal units as an alternative. The integrated insufflation system and the single-use tubing system is beyond affordability in an already challenged-free healthcare system as Sri Lanka. This simple improvisation provided a cost-effective alternative. The suction mechanism on the endoscope replaced the requirement for a smoke evacuation system. A disadvantage of using the endoscope is the loss of orientation in the lumen of the rectum. We found that making mucosal markings with the diathermy at 12 'o clock position helped in orientation during the luminal phase of the dissection.

We believe this is the first reported case in the literature of a double single-port TaTME with panproctocolectomy and IPAA in Sri Lanka. We believe these improvisations will help popularize TaTME procedures amongst surgeons in the resource-limited setting. The innovative practice of surgery encourages safe practice delivered to patients at a lesser cost.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

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