

Perineal colostomy: advantages and disadvantages

Francesk Mulita¹, Konstantinos Tepetes², Georgios-Ioannis Verras¹, Elias Liolis³, Levan Tchabashvili¹, Charalampos Kaplanis¹, Ioannis Perdikaris¹, Dimitrios Velissaris³, Ioannis Maroulis¹

¹Department of Surgery, General University Hospital of Patras, Patras, Greece

²Department of Surgery, University Hospital of Larissa, Larissa, Greece

³Department of Internal Medicine, General University Hospital of Patras, Greece

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Address for correspondence: Dr. Francesk Mulita, Department of Surgery, General University Hospital, Patras, Greece,
e-mail: oknarfmulita@hotmail.com

Abstract

The perineal colostomy is a reconstruction method performed after abdominoperineal resection for rectal malignancy. In this technique, the permanent colostomy is not placed in the left quadrant of the abdomen, but in the perineum. According to the literature, this technique provides many advantages such as a higher degree of satisfaction and greater quality of life to patients. Although this method could be a good option in selected patients, physicians should always be aware of the disadvantages of perineal colostomy.

Introduction

In the past few years, developments in the field of rectal cancer surgery have mostly been aimed towards preservation of sphincter function, with the pinnacle of modern technical approaches being low anterior resection with total mesorectal excision and primary colo-anal anastomosis, for tumours as close as 2 cm to the anal sphincter [1]. Despite every effort being made to preserve sphincter function, in order for the patient to achieve satisfactory quality of life, in many instances tumour localization makes abdominoperineal resection of the colon inevitable – a procedure first popularized by Ernest Miles in 1908 [2]. As opposed to forming an end colostomy placed in the left iliac fossa (or right ileostomy, of total resection), many surgeons have come up with different techniques in order to place the resulting colostomy in the perineal area. The perineal colostomy, following total abdominoperineal excision, is a type of colostomy, achieved by multiple, evolving approaches, which aims to utilize the natural anal orifice as the ostomy's point of exit, while simultaneously employing several reconstructive and grafting techniques, in order to restore sphincteric function, despite radical bowel excision [3–5].

Technical considerations

The first described perineal colostomy technique was published by Schmidt in 1982 [6]. In his version, a small segment of about 8–10 cm of bowel is resected and prepared for use as a pseudo-sphincter [5]. This fragment is stripped of its mesocolon and epiploic fat and placed in an antibiotic solution. The graft is turned “inside-out” like a sleeve, so the serosa is on the inside and the mucosal layer is on the outside. Then, the segment is carefully stripped of the mucosal layer, until the muscular layer is encountered. A small mesocolon window is opened, approximately 2 cm from the distal end of the bowel, and the graft is threaded through the window and wrapped around the colon, typically for 1.5 turns, and sutured secure in place. Finally, the colon is lowered to the perineum, taking care to ensure that the length is adequate for a tension-free colostomy. Once in place, the colostomy is matured through the anal aperture [5, 7]. Another utilized technique is that of constructing valve-like stenoses in the colonic segment, by making circumferential incisions through the seromuscular layer, which are then approximated by invaginating sutures, in order for the protruding mucosa, to create a valve-like structure within the lumen [8, 9].

Then, the bowel is placed as described above, tension-free, within the perineum. The distance between the incisions is usually 10 cm, but some authors also suggest more continent results when the incisions are at 5 cm [8, 10]. A much discussed issue is whether the omentum must be used to compensate for the tissue loss after total mesorectal excision – a process called omentoplasty [8, 11]. Omentoplasty is usually necessary when adequate closure of the pelvic peritoneum cannot be achieved [10]. Wang *et al.* described a novel technique that is useful in laparoscopic abdominoperitoneal excisions. According to their publication, after excision, a small incision is made in the abdominal wall, through which the colon can be pulled. In addition to creating the circumferential incisions as mentioned above, they also described folding the colon at a 90° angle, so that it resembles the sigmoid colon [12]. Then, it is reintroduced in the abdominal cavity, and colostomy construction is finished laparoscopically with perineal assistance. A modified technique for pseudocontinent colostomy is also found in the literature. In this variation, apart from Schmidt's graft, an additional vertical rectus abdominis mucocutaneous (VRAM) flap is utilized [13]. Once the above-described process is complete, mobilization of a skin pad, along with part of the rectus abdominis muscle, up to the pubic symphysis is started. Once mobilized, the flap, along with the skin pad, is passed below the pelvis and rotated in such a way that the skin pad will cover the perineal opening and the connected VRAM will pass around the neo-rectum, acting as the external sphincter [13]. According to Nassar, this modified technique achieves satisfactory continence rates of up to 93%, while minimizing perineal incision complications [13]. Utilization of gracilis muscle flaps or in some cases, gluteus maximus flaps, as a reconstructed anal sphincter, is a technique that has also gained ground the past few years [14–16]. In this technique, following standard abdominoperineal resection, the gracilis muscle is harvested from the interior thigh. Utilizing 2 or 3 small incisions, the muscle and its distal tendon can be easily identified and dissected, with a combination of sharp and blunt dissection. Care must be taken to localize the neurovascular pedicle early on the muscle's posterolateral side and preserve it. Once the colon transposition on its final ostomy site is complete, the muscle is pulled through the first incision, assessing for viability of the neurovascular pedicle, and it is threaded towards the ostomy site through a subcutaneous tunnel. There, it is wrapped around the colon to simulate an anal sphincter [14]. Alterations of this technique include using both gracilis muscles, to form a reconstructed pelvic floor, and implanting neurostimulators, that can further assist in effective muscle contraction [7, 14, 15].

Perineal colostomy advantages

The absolute priority, when discussing any reconstructive technique, is to always ensure that it does not compromise the oncological results of the original surgery. Several studies have shown that perineal colostomy not only does not compromise, but also facilitates more radical excisions, to ensure R0 results, by providing a reconstruction alternative [3, 13, 17]. Patient satisfaction rates are significantly better when compared to ostomy procedures, and they also tend to score higher on everyday functionality scores and quality of sexual life scores [5, 7, 10, 11, 18]. Some authors have reported overall satisfaction scores of up to 85% in patient series [7]. When compared to abdominal colostomy, perineal colostomy was able to demonstrate a better postoperative course for the patients involved, significantly less healing time, and a decreased frequency in ostomy-related complications [10]. One of the most discussed aspects of perineal colostomy formation is whether the reconstructive technique and the neo-sphincter manage to substitute the natural pelvic sphincteric mechanism. In many case series, satisfactory continence (usually reported as Kirwan class up to C) can be seen in up to 93% of the patients, with or without the use of anti-diarrhoeal medicine [7, 12, 13, 19, 20]. Known reports indicate that regardless of the technique employed, perineal colostomy with reconstruction seems to achieve satisfactory continence results, as well as anticipatory bowel habits, through scheduled irrigation [4, 5, 21]. In many studies, sphincter functionality was also confirmed via rectal manometry and defecographic studies, which demonstrated achievable increase in tone after voluntary contraction [7, 9, 19, 22]. Additionally, constructing a continent perineal colostomy through a natural orifice also allows for easier distal “neo-rectal” examination, colonoscopy, or endoscopic US, for the detection and screening of local recurrence [5, 7, 13, 21].

Perineal colostomy disadvantages

Being such an invasive procedure, formation of pseudo-continent perineal colostomy is expected also to have certain drawbacks. When compared to traditional abdominal colostomy, some patients felt it was harder to manage, due to the need for frequent irrigation, and while physical and sexual functionality was better, the social functionality of the patients seemed to be worse [18]. Among the reported complications, was mucosal prolapse from the colostomy, suppurative complications of the perineum, wound dehiscence, herniation, absence of perineal sensation, and in approximately 25% of the male patients, erectile dysfunction [3, 5, 7, 9, 11–14, 18, 21, 23–25]. Among these, suppu-

Table 1. The main characteristics and results of identified studies are summarized

Study 1 st author, publication year	Country	Study design	Number of participants, female %	Age [years]	Advantages of perineal colostomy	Disadvantages of perineal colostomy
Souadka, 2015 [4]	Morocco	Retrospective cohort	146, 51.4%	Mean (SD): 47 (10)	Simple, safe, and reliable pelvic reconstruction technique Provides a high degree of patient satisfaction without compromising oncological results Good option in selected patients, especially in Muslim and low-income country populations	10.9% mucosal prolapse Valve slows but does not prevent motility altogether
da Silva, 2014 [8]	Brazil	Retrospective analysis	55, 60%	Mean (range): 58 (38–80)	Irrigation timing varies and can be adjusted per patient Fills the pelvis Prevents dermatitis and vaginosis The valve method is graft-independent	
Kirzin, 2010 [10]	France	Retrospective analysis	110, 41.8%	Mean (SD): 62 (12)	<i>Vs. abdominal colostomy</i> Less postoperative intra-perineal complications (infectious, wound dehiscence, time to heal) ($p = 0.008$) Significantly less average healing time ($p = 0.048$) and fewer cases requiring more than 1 month ($p = 0.018$) Those with radiotherapy, showed fewer complications in the perineal colostomy group ($p = 0.001$)	
Farroni, 2007 [18]	Belgium	Qualitative QoL analysis	13, 53.8%	Mean (range): 61 (53–62.5)	<i>Vs. abdominal colostomy</i> Higher scores in physical functioning and sexual functioning Fewer instances of fecal loss Fewer stoma-related problems	<i>Vs. abdominal colostomy</i> Lower scores in social functioning Bowel control was more difficult to manage
Lasser, 2001 [5]	Canada	Prospective analysis	40, 32.5%	Mean: 50	Satisfactory functional results in 86% of the patients Screening for local recurrence, using rectal examination, or endoscopy, was easier Little to no extension of surgical time Used same incision Schmidt's observations for hypertrophy and plexus preservation were confirmed upon excision of failed perineal colostomy	55% of the patients reported any kind of morbidity 25% reported suppurative complications 60.5% report gas incontinence 23.5% report minimal soiling In case of functional failure, a second operation was needed to convert to iliac colostomy

Table 1. Cont.

Study 1 st author, publication year	Country	Study design	Number of participants, female %	Age [years]	Advantages of perineal colostomy	Disadvantages of perineal colostomy
Hirche, 2010 [11]	Germany	Retrospective analysis	27, 58.8%	Mean (range) 55 (37–65)	Sphincter manometry, showed 5 to 81 cmH ₂ O for resting and 49 to 364 cm H ₂ O for compression pressures, after primary reconstruction Median continence score, revealed sufficient continence 74% of the patients were sexually active Acceptable results in global health and disease specific questionnaires	Minor complications related to continence in 23% of the patients Erectile dysfunction in 25% of the patients
Landen, 2018 [20]	UK	Case report	1, 100%	51	The patient reported good continence after 1 year, despite short bowel length, and absence of neosphincter	Serious perineal herniation and colostomy prolapse
Gamagami, 1998 [7]	U.S.	Prospective analysis	63, 50.8%	Mean (range): 60 (31–79)	85% of the patients were satisfied with the functionality 59% gained satisfactory continence Avoided additional incisions for sphincter construction Earlier detection of local recurrence, with digital examination or ultrasound guidance	Wound dehiscence, strictures and muscular prolapse 33% of the patients required medication to control stool frequency 1/3 felt uncomfortable 1/3 had gas incontinence 1/3 had difficulty with colonic irrigations, especially obese and mentally challenged patients
El Marouni, 2018 [25]	Morocco	Case report	1	75		Bowel prolapse from perineal colostomy
Souadka, 2014 [21]	Morocco	Letter to the Editor			Preservation of body image Use of natural orifice, and avoidance of pouching systems Good functional results and high ostomy satisfaction rates Counteracts the “phantom bowel” syndrome Allows accessibility for distal rectal examination	Regular colonic irrigation
Lirici, 2004 [14]	Italy	Retrospective analysis	6, 33.33%	Mean (range): 62 (42–76)	Adequate continence achieved in the artificial sphincter group Satisfactory continence and social QoL scores, in patients with graciloplasty No postoperative infections	Skin ulceration from device pouch, in the artificial sphincter patents Gracilis muscle, is a fast-twitch muscle, and that leads to premature fatigue

Table 1. Cont.

Study 1 st author, publication year	Country	Study design	Number of participants, female %	Age [years]	Advantages of perineal colostomy	Disadvantages of perineal colostomy
Velitchkov, 1997 [9]	Bulgaria	Prospective analysis	9, 77.7%	Mean: 55.6	Adequate continence without the use of enema in 55% of the patients Soiling was adequately managed with anti-diarrheal medicine	Parastomal suppuration Minimum to moderate fecal soiling in 44% of the patients Absence of neo-anal sensation Technique unavailable if left colectomy is employed
Dumont, 2013 [3]	France	Retrospective analysis	22, 72.3%	Mean (range): 60.3 (39–89)	Vs. Intersphincteric Resection Less evacuation-related difficulties Physical functioning scores, better in the PPC group Lower risk of recurrence	Vs. intersphincteric resection Peri-perineal infection and disunion Higher defecation problem score Need for irrigation
Wang, 2014 [12]	China	Retrospective analysis	21, 38%	Mean (range): 57 (36–72)	55.6% of the patients had satisfactory continence	Mucosal oedema in 33% of the patients Mucosal prolapse in 9.5% of the patients Wound infection in 4.8% of the patients Mucosal necrosis in 4.8% of the patients
Nogueira, 2013 [23]	Brazil	Retrospective analysis	27 (44.44%)	Mean (range): 56.3 (37–87)	Decreasing the distance between valves, results in better continence Low recurrence rate (3.7%)	Perineal prolapse in 14.8% Dehiscence in 7.4% of the patients Stenosis in 7.4% of the patients
Nassar, 2011 [13]	Egypt	Prospective cohort study	14, (21.42%)	Mean (range): 41 (22–63)	A technique that can be implemented in RO excision 57% of the patients were fully continent After 12 months, 93% of the patients reported no more than minor soiling Easily identifiable by endoscopic US Complete remission of enemas in some patients VRAM has well documented less perineal complications (dehiscence, sepsis)	Lack of sensation for bowel movement or gas passage Perineal sepsis in 14% Stricture in 29% Mucosal prolapse in 21%

Table I. Cont.

Study 1 st author, publication year	Country	Study design	Number of participants, female %	Age [years]	Advantages of perineal colostomy	Disadvantages of perineal colostomy
Santoro, 1994 [19]	Italy	Retrospective analysis	14 (50%)	Mean (range): 61 (32–73)	72% of the patients were satisfied with continence and sensation Defecographic studies were satisfactory in all patients Increased tone in voluntary squeeze	Serious bleeding complications in 21% of the patients Perineal infection Neo-anal stenosis
Souadka, 2016 [17]	Morocco	Retrospective study	15 (60%)	Mean (SD): 50 (9)	80% of the patients had no postoperative soiling Muscular graft shoed response, and could act as a sphincter	Colonic irrigation necessary in 75% of the patients Hypotonic pseudosphincter
Hosdurg, 2018 [24]	India	Case report	1	30	Prompt return to social functionality Acceptable continence	
Azizi, 2013 [22]	France	Retrospective study	17 (41.1%)	Mean (range): 46 (34–71)	Both muscle fibre types, result in better continence Low rate of strictures Overall quality of life scales > 70%	Early complications in 40%

rative complications are the most frequently reported in higher percentages when compared to abdominal end colostomy [5, 7, 9, 12, 13, 22].

Table I summarizes the advantages and disadvantages of perineal colostomy based on 20 selected PubMed-indexed articles.

Conclusions

This review shows that perineal colostomy is a safe and reliable technique performed after abdominoperineal resection, providing a higher degree of satisfaction and greater quality of life for patients. Although this method could be a good option in selected patients, physicians should always be aware of the disadvantages of perineal colostomy.

Conflict of interest

The authors declare no conflict of interest.

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