Perineal colostomy: advantages and disadvantages

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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 iliostomy, 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 I. The main characteristics and results of identified studies are summarized

| Study 1st 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  
Good option in selected patients, especially in Muslim and low-income country populations | 
| 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 | 10.9% mucosal prolapse  
Valve slows but does not prevent motility altogether |
| Kirzin, 2010 [10]                | France      | Retrospective analysis | 110, 41.8%                      | Mean (SD): 62 (12) | Vs. abdominal colostomy  
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) | Vs. abdominal colostomy  
Higher scores in physical functioning and sexual functioning  
Fewer instances of fecal loss  
Fewer stoma-related problems | 
| 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  
29% reported suppurrative 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 |
| Study 1st 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 cmH2O for resting and 49 to 364 cm H2O for compression pressures, after primary reconstruction | 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          | 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 |
| Souadka, 2014 [21]              | Morocco | Letter to the Editor   |                                  |             |                                     |                                     |
| 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 |
| Study 1st 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  
Minimum to moderate fecal soiling in 44% of the patients  
Absence of neo-anal sensation  
Technique unavailable if left colectomy is employed  | Parastomal suppuration  
Peri-perineal infection and disunion  
Higher defecation problem score  
Need for irrigation |
| 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 R0 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 design | Age [years] | Number of participants | Country | Number of female % | Study population year | Study population size | Advantages of perineal colostomy | Disadvantages of perineal colostomy |
|--------------|-------------|------------------------|---------|--------------------|----------------------|-----------------------|---------------------------------|---------------------------------|
| Retrospective analysis | Mean (range): 46 (34–73) | 14 (50%) | Italy | 1994 | Santoro, 1994 [19] | 72% of the patients were satisfied with continence and sensation | Increased tone in voluntary squeeze | Serious bleeding complications in 21% of the patients |
| Retrospective study | Mean (SD): 50 (9) | 15 (60%) | Morocco | 2016 | Souadka, 2016 [17] | 80% of the patients had good postoperative soiling | Muscular graft showed response, and could act as a sphincter | Colonic irrigation necessary in 75% of the patients |
| Case report | | 1 | India | | Hoddur, 2018 [24] | Prompt return to social functionality | Acceptable continence | Neo-anal stenosis |
| Retrospective study | Mean (range): 46 (34–73) | 17 (41.1%) | France | 2013 [22] | Azizi, 2013 [22] | Both muscle fibre types result in better continence | Low rate of stenosis | Hypotonic pseudosphincter |
| Retrospective study | Mean (range): 46 (34–73) | 17 (41.1%) | France | 2013 [22] | Azizi, 2013 [22] | Both muscle fibre types result in better continence | Low rate of stenosis | Hypotonic pseudosphincter |

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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