

Diversion following rectal cancer surgery

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Abstract

Rectal cancer surgery is moving from organ sacrificing abdominoperineal resection (APR) to organ-preserving anterior resection (AR). Neoadjuvant chemoradiation, low anterior resection and coloanal anastomosis play a major role in this context. Anastomotic leakage (AL) is the most feared complication of these procedures. Therefore, much importance is given to proximal diversions to protect anastomosis. This review has critically analysed the indications, various methods available, challenges, complications, benefits and patient selection for proximal diversions.

Introduction

Rectal cancer surgery has developed from organ sacrificing abdominoperineal resection to organ-preserving procedures with the introduction of Total Mesorectal Excision (TME), neoadjuvant chemoradiation and Trans-anal TME (TaTME). As a result of this, more rectal tumours in the distal rectum end up with restored continuity of the bowel with even lower anastomosis in the pelvis.

An anastomotic leak (AL) is the most dreaded complication for a surgeon as it can lead to the death of a patient. Introduction of proximal diversion of the faecal stream by various methods is considered protective of AL. However, this is not without debate on exact indications, methods of diversion, the morbidity associated with diversion and issues on the reversal of proximal diversion as well. This review aims to ascertain/assess the available evidence on these issues to find answers for them.

Protection of the anastomotic site is achieved by the temporary diversion of the faecal stream before reaching it and bringing it out as a stoma through the anterior abdominal

wall. Defunctioning or diverting stoma is created to minimize the impact of a subsequent anastomotic leak.

The International Study Group of Rectal Cancer (ISREC) have defined an anastomotic leak (AL) as 'a communication between the intra- and extra-luminal compartments owing to a defect of the integrity of the intestinal wall at the anastomotic site'[1]. Demonstration of a pelvic abscess in the vicinity of an anastomosis, without demonstrable communication with the bowel lumen, is also considered as originated from a leak. This definition does not include microscopic leaks which are not clinically evident in most of the time.

Diversion or no diversion

Whether to divert patients undergoing rectal cancer surgery or not was debated but has come up with mixed conclusions. A meta-analysis of four randomized clinical trials and 21 non-randomized trials including 11 429 patients by Tan, W.S et al[2] concluded as; a defunctioning stoma would reduce the clinical anastomotic leak rate and reoperation rates. Further, in the same analysis, they found a statistically significant reduction of mortality among patients with a stoma in the non-randomized group. Same conclusions were made on anastomotic leaks and reoperations by another meta-analysis of 11 studies by Sheng-Wen Wu et al[3] as well.

A contrary report was published 2017 by Yuchen Wu et al [4] in Nature conclude 'diverting stoma does not delay or reduce the AL but it reduces the recovery time of non-severe AL'. Further, they did not detect a positive impact on the occurrence or recovery of severe AL and its manifestation on distant or local recurrence rates or relapse-free survival as well. By this publication, Yuchen Wu et al have challenged the popular belief of reduction of consequences of AL by a diverting stoma.

Minimal invasive methods have established its place in colorectal surgery and proven to have technical advantages in rectal cancer surgery[5,6,7]. Peter Ihnat et al[8] concluded in a publication in 2016 that diverting ileostomy does protect the anastomosis following laparoscopic rectal cancer surgery but at a high price in terms of ileostomy related complications and

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morbidity.

Considering all the evidence in front of us it is fair to conclude proximal diversion after rectal cancer surgery should be individualized.

What is the method to divert?

A proximal diverting loop ileostomy is the most popular method of diversion owing to advantages over colostomy [9]. However meta-analysis on 5 randomized trials has failed to appreciate any significant advantage between these two methods; diverting ileostomy or colostomy [10]. Even though fewer incidents associated with ileostomy prolapse is seen as an advantage over colostomy in this meta-analysis, some may consider this as helpful in a reversal of stoma. Another randomized trial looked at the more significant complication of intestinal obstruction and concluded that colostomy is associated with less incidence of obstruction [11].

With all the above evidence and considering that AL rate following TME and LAR is around 7.5 -10% [12,13]; we may be creating stomas in 90% or more patients subjecting them to stoma related complications and morbidity without a real advantage. Should we create diverting stoma at all or is there a less invasive and convenient way to mature a stoma if the need arises? There are two methods described and practised i.e. Temporary percutaneous ileostomy(TPI)[14, 15]and Ghost ileostomy(GI)[16,17].

Patients with TPI will have a feeding jejunostomy tube inserted into the proximal limb of an ileal loop and will obliterate the lumen by inflating the balloon of the tube. Other end of the tube will be delivered out through the anterior abdominal wall[15]. Advantage of this method is the ability to reverse it without another surgery on an average of 9 days against 106 days on average for a conventional loop ileostomy(CLI) availing the CLI related complications [14].

GI is the least invasive method to mature an ileostomy in the event an AL is suspected. This will mark and facilitate the site to create an ileostomy in the unfortunate occurrence of an AL[16,17]. Therefore, GI will prevent all complications related to CLI and minimize the morbidity as well.

Challenges, Issues and Limitations

Diverting stomas are also not without complications and there is a certain amount of reduction of quality of life simply due to stoma related complications and morbidity in relation to skin excoriation, stoma leakage, stoma obstruction and retraction [18]. However, when it comes to other patients who would

end up having LAR, decision making can be governed by various other factors like preceding chemoradiation, general fitness, and co-morbidities. Besides, we have to take into consideration the possibility to reverse the stoma as well and the consequences of stoma reversal. Some of the temporary stomas will become permanent due to the simple fact they never get reversed [19]. Other stomas will not be reversed because patients were given preoperative chemoradiation [20] or started on adjuvant chemotherapy. However the evidence support that reversal could be carried out safely while patients on chemotherapy [21] without additional risk for complications. Reversal of temporary stomas can give rise to complications in about 32% of patients i.e. wound sepsis, small bowel obstruction and incisional hernia [18].

Patient selection

It is not necessary to mature a diverting stoma on every patient undergoing LAR. Only those who can outweigh the risk of complications and morbidity of a stoma to the benefits of having it, should be given a stoma [22, 23]. Following a retrospective and prospective review of articles spanning over 50yrs M. Hanna et al reported low colo-rectal anastomosis, colo-anal anastomosis, difficult resections, malnutrition and male patients would be benefitted by a diverting stoma [24, 25,26].

Pre-operative chemoradiation, low rectal anastomosis and male gender are predisposing for AL [27]. The proximal diverting stoma will reduce the incidence of AL, the manifestations of AL and reduce the need for immediate reoperation rates [3, 24, 25]. However, evidence of proximal faecal diversion on the reduction of mortality is inconclusive [2]

Those patients with obstructing colorectal cancer resection and anastomosis with a proximal diverting ileostomy would have higher complication rates, deep wound infections, sepsis and readmission rates [28].

With contradicting opinions as above, it is challenging to decide who would benefit from a diverting stoma. We can safely conclude it would be beneficial to mature a diverting stoma in a male; whose anastomosis is located within 6cm from the anal verge [25].

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