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 anastomatic 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...
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].

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.
References


