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Review Article

Anastomotic dehiscence after colorectal surgery

Ketan Vagholkar*, Amish Pawanarkar, Suvarna Vagholkar, Subashchandra Subudhi, Avinash Jawanjal, Parthsarthi Chauhan, Purva Agrawal

Department of Surgery, D. Y. Patil University School of Medicine, Navi Mumbai, 400706, Maharashtra, India

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***Correspondence:**
Dr. Ketan Vagholkar,
E-mail: kvagholkar@yahoo.com

ABSTRACT

Anastomotic dehiscence after colorectal surgery can have disastrous consequences. Various factors determine the chances of anastomotic failure. The technical and systemic factors which a surgeon needs to be aware of are presented in this article.

Keywords: Colorectal anastomosis leakage, Diagnosis, Risk factors

INTRODUCTION

Anastomotic leak after colorectal surgery is catastrophic complication. The aetiology may be multi factorial.[1] A variety of causes ranging from intrinsic disease of the intestine, presence of co morbidities to technical factors have been implicated. Understanding these factors is pivotal in adopting optimum preventive strategies to avert leakage.[2]

Anastomotic leakage is usually picked up once it becomes clinically manifest. The clinical determinants of anastomotic leakage are fistula to the skin or vagina, fever over 38^{o}C, systemic septic complications associated with anastomotic leaks picked up radiologically or endoscopically with formation of intraperitoneal abscess or clinical features of peritonitis. Any of the aforementioned features strongly suggest the presence of anastomotic leak.[3,4]

Incidence of anastomotic leakage is usually higher in anterior resections of the colon. However overall incidence varies from 3.5%-40%.[1] The variation in incidence is usually attributed to the size of leak. Smaller leaks do not manifest clinically at an early stage. However larger leaks may manifest early by virtue of development of early septic complications.

Technical factors

Maximum stress needs to be placed on meticulous technique of anastomosis.[5] This includes a wide spectrum of technical tips which should be followed by the operating surgeon. Adequate exposure is key to good surgical dissection. Adequate surgical exposure includes a good incision, excellent bowel mobilisation, optimal illumination and convenient positioning of retractors. These techniques enable the surgeon to have a tension free access to the involved segment of large bowel. Compromise of any of these techniques predisposes to compromise in the quality of surgical technique thereby predisposing to leakage.

Bowel preparation

Preoperative mechanical and chemical bowel preparation in cases involving the colon improves surgical outcomes.[4,5] An empty bowel reduces the incidence of contamination during the course of resection. Even in the event of an anastomotic leakage the magnitude of the septic process is reduced significantly as the quantity of

faecal leakage is less. Various studies have been carried out to compare the results of colonic surgery in unprepared bowel vs. prepared bowel. Surprisingly results in unprepared bowel have been proven to be superior. However it is a safe practice to mechanically and chemically prepare the large bowel prior to a surgical resection.

Blood supply of the bowel

Critical assessment of the blood supply is essential for good healing.[6] Thus various methods such as measurement of tissue oxygenation and laser Doppler flow meter studies are being routinely done in many centres. Yet intraoperative assessment of the vascularity of the involved segment of bowel is crucial. Healthy appearance of bowel, undistended state, good mesocolic pulsations, less adhesions to the surrounding structures are important factors which need to be considered prior to determining level of resection.

Suturing techniques

Traditionally a two layered anastomosis is usually performed in the colon.[7] However it is advisable to perform a single layer anastomosis when it involves the lower colon and rectum. With the advent of staplers, lower colorectal anastomoses are routinely being done by stapling.[8] However surgeon needs to be careful to ensure the completeness of the doughnut after completing the stapled anastomosis. Various studies have shown improved results with stapled anastomosis.

Confirmation of the integrity of the anastomosis

It has become a standard practice to confirm intraoperatively that there is no anastomotic leak, especially in case of low anterior resections. Intra operative testing is usually carried out. The anastomosis is immersed under normal saline and air is gently pushed from the rectum. Any bubbling of air is suggestive of an inadequate anastomosis which needs to be managed by a reinforcing stitch or refashioning of the anastomosis.[8]

Protective stoma

Some surgeons advise the creation of a proximal defunctioning stoma in order to prevent overloading of the colon by faecal contents. In the event of leaks the proximal stoma will prevent leakage and gross contamination by faecal matter. This proximal stoma can be closed after 12 weeks. A distal cologram needs to be performed to ensure the complete integrity of the healed anastomosis prior to closure of the stoma.[3]

Drains

Placement of tube drains in the vicinity of the surgical site is a traditional procedure.[9] The tube drains prevent an accumulation of tissue fluids or oozing blood from raw dissected areas. In the event of leakage, the nature of contents coming from the tube can confirm a diagnosis of anastomotic leak. In cases where the leak happens to be minor one, a functioning tube drain can be therapeutic. However quite a few surgeons oppose the use of a tube drain. This group of surgeons claim that the tube drain can cause irritation and damage to the operated area, thereby increasing the chances of anastomotic dehiscence. However it is safe practice to utilize the concept of placing a tube drain after any colorectal anastomosis.

Local sepsis

The intrinsic pathology for which a surgical procedure is performed merits special attention. In conditions where there is significant serious local sepsis such as perforated diverticulum, perforated colorectal cancer or colorectal trauma it is preferable to defer primary anastomosis.[10-12] Healing of anastomosis in a septic environment is extremely inadequate and is associated with a high incidence of anastomotic dehiscence. Such cases necessitate proximal diversion in the form of Hartman's procedure.[13] In the event of a loaded colon during the course of an elective surgical procedure no chance should be taken with an unprotected primary anastomosis. Proximal diverting stoma is mandatory in such cases.

Anaesthetic medications

Surgeons usually tend to neglect this factor as the cause for anastomotic damage. Neostigmine which is used to reverse the effect of curare type of relaxants, evokes active contraction of intestine after completion of anastomosis and may result in disruption. Therefore neostigmine should never been used during colorectal surgery.[14,15] Chemotherapeutic agents also exert an antihealing effect there by predisposing to anastomotic leakage.[13,16] Corticosteroids should also be avoided as far as possible as they significantly retard the healing process.

Systemic factors

This includes hypoproteinemia with albumin less than 3gm/dl, haemoglobin less than 10 gm% and advanced malignancy with excessive bleeding that can compromise blood supply to the anastomotic site. Excessive bleeding warrants blood transfusion. This can exert an immunosuppressive effect thereby increasing the chance of dehiscence. Medical co morbidities which affect wound healing such diabetes adversely affect surgical outcomes.[12-14]

CONCLUSION

Leakage of colorectal anastomosis has disastrous consequences. Proper selection and adequate preoperative preparation of the patient is necessary. Utmost stress should be laid on technical factors in order to prevent an

anastomotic leakage. Prompt proximal diversion in the event of a leakage is lifesaving.

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