



EMIRATES SOCIETY
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Anastomotic leak in Colorectal Surgery

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(ESCRS)**



Definition

- Defect at the anastomotic site: communication between intraluminal and extraluminal compartments.
- Confirmed radiographically, endoscopically or intraoperatively.
- A pelvic abscess close to the anastomosis anastomotic leak.

SURGERY
A MONTHLY JOURNAL DEVOTED TO THE ART AND SCIENCE OF SURGERY

Definition and grading of anastomotic leakage following anterior resection of the rectum: A proposal by the International Study Group of Rectal Cancer

Nuh N. Rahbari, MD, Jürgen Weitz, MD, Werner Hohenberger, MD, Richard J. Heald, MD, Brendan Moran, MD, Alexis Ulrich, MD, Torbjörn Holm, MD, W. Douglas Wong, MD, Emmanuel Tiset, MD, Yoshihiro Moriya, MD, Søren Laurberg, MD, Marcel den Dulk, MD, Cornelis van de Velde, MD, Markus W. Büchler, MD

Published Online: December 11, 2009

PlumX Metrics



Eur J Surg Oncol. 2012 Nov;38(11):1013-9. doi: 10.1016/j.ejso.2012.07.111. Epub 2012 Sep 3.

Meta-analysis of the risk for anastomotic leakage, the postoperative mortality caused by leakage in relation to the overall postoperative mortality.

Snijders HS¹, Wouters MW, van Leersum NJ, Kolfschoten NE, Henneman D, de Vries AC, Tollenaar RA, Bonsing BA.

+ Author information

Abstract

BACKGROUND: Availability of anastomotic leakage rates and mortality rates following anastomotic leakage is essential when informing patients with rectal cancer preoperatively. We performed a meta-analysis of studies describing anastomotic leakage and the subsequent postoperative mortality in relation to the overall postoperative mortality after low anterior resection for rectal cancer.

pooled and a meta-analysis was performed.

RESULTS: Twenty-two studies with 10,343 patients in total were analyzed. Meta-analysis of the data showed an **average AL rate of 9%**, postoperative mortality caused by leakage of 0.7% and overall postoperative mortality of 2%. The studies showed variation in incidence, definition and measurement of all outcomes.



Grades of Anastomotic leak

- Grade A: managed without invasive intervention
- Grade B: managed with invasive intervention other than a laparotomy (e.g., percutaneous drainage).
- Grade C: those requiring laparotomy.



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Prevention

- Preoperative & Perioperative Nutrition
- Mechanical Bowel Prep. & Oral Abs
- Omentoplasty
- Staple-line Reinforcement
- Intraoperative Assessment
- Diverting Stomas
- Tips



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Preoperative & Perioperative Nutrition

- Preoperative malnutrition is a major risk factor
- Defined by;
 - Weight loss of 10% or more,
 - Serum albumin less than 3.5 g/dL, and
 - Serum total protein less than 5.5 g/dL





MBP with Antibiotic

- Alone does not impact the incidence of anastomotic leaks in elective **colon** resections.
- There is a growing body of evidence that MBP, when given in combination with oral antibiotics, significantly decrease the incidence of infectious complications after colorectal resections, including anastomotic leak.
- The most familiar antibiotic regimen is that proposed consisting of;
- Neomycin (1 g) and Erythromycin (1 g) at 1:00, 2:00, and 10:00 pm.

[Ann Surg.](#) 2010 Nov;252(5):863-8. doi: 10.1097/SLA.0b013e3181fd8ea9.

Rectal cancer surgery with or without bowel preparation: The French GRECCAR III multicenter single-blinded randomized trial.

[Bretagnol F¹](#), [Panis Y](#), [Rullier E](#), [Rouanet P](#), [Berdah S](#), [Dousset B](#), [Portier G](#), [Benoist S](#), [Chipponi J](#), [Vicaut E](#); French Research Group of Rectal Cancer Surgery (GRECCAR).

[+](#) Author information

Abstract

OBJECTIVE: To assess with a single-blinded, multicenter, randomized trial, the postoperative results in patients undergoing sphincter-saving rectal resection for cancer without preoperative mechanical bowel preparation (MBP).



Stable-line Reinforcement

- Two recent randomized controlled trials (RCTs) evaluating reinforcement with bioabsorbable material did not show any benefit in reducing anastomotic leaks

[Dis Colon Rectum](#). 2014 Oct;57(10):1195-201. doi: 10.1097/DCR.0000000000000207.

Preventing complications in colorectal anastomosis: results of a randomized controlled trial using bioabsorbable staple line reinforcement for circular staple

[Placer C¹](#), [Enríquez-Navascués JM](#), [Elorza G](#), [Timoteo A](#), [Mugica JA](#), [Borda N](#), [Saralegui Y](#), [Elósegui JL](#).

[+](#) Author information

Abstract

BACKGROUND: Anastomotic complications, including leaks, stenoses, and bleeding, cause considerable mortality and morbidity after colorectal surgery.

[Dis Colon Rectum](#). 2014 Mar;57(3):324-30. doi: 10.1097/DCR.000000000000065.

Bioabsorbable staple line reinforcement in restorative proctectomy and anterior resection: a randomized study.

[Senagore A¹](#), [Lane FR](#), [Lee E](#), [Wexner S](#), [Dujovny N](#), [Sklow B](#), [Rider P](#), [Bonello J](#); [Bioabsorbable Staple Line Reinforcement Study Group](#).

[+](#) Author information

Abstract

BACKGROUND: Anastomotic complications, including leaks, strictures/stenoses, and bleeding, cause considerable mortality and morbidity after colorectal surgery.

Omentoplasty

- Described by Goldsmith in 1977
- A meta-analysis demonstrated **no benefit** has been found in colorectal anastomoses

Dis Colon Rectum. 2000 Jul;43(7):951-5.

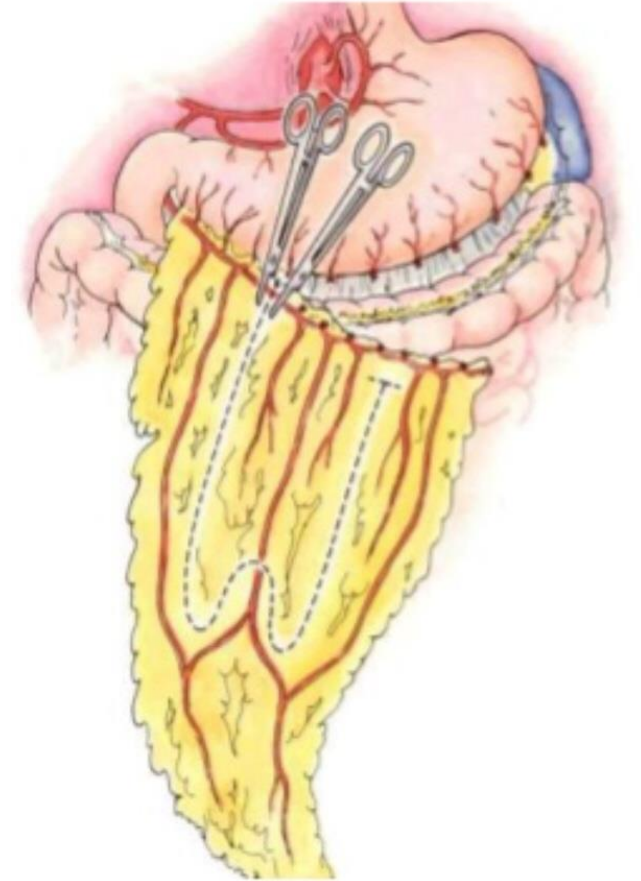
Prospective evaluation of omentoplasty in preventing leakage of colorectal anastomosis.

Tocchi A¹, Mazzoni G, Lepre L, Costa G, Liotta G, Agostini N, Miccini M.

+ Author information

Abstract

PURPOSE: The aim of this study was to investigate the role of omentoplasty, by means of intact omentum, in preventing anastomotic leakages after rectal resection.





Tips

Article published online: 2022-12-22

286 Original Article



Impact of the Vertical Division of the Rectum on the Decrease in Reloading of the Endostapler for a Complete Division in Colorectal Cancer

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Abdalwahab R. Abdalwahab¹ Tarek M. Hashem¹ Sara I. Albastaki²

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J Coloproctol 2022;42(4):286–289.

Int J Colorectal Dis (2008) 23:703–707
DOI 10.1007/s00384-008-0470-8

ORIGINAL ARTICLE

Relationship between multiple numbers of stapler firings during rectal division and anastomotic leakage after laparoscopic rectal resection

Masaaki Ito • Masanori Sugito • Akihiro Kobayashi • Yusuke Nishizawa • Yoshiyuki Tsunoda • Norio Saito

Number of firings

1-2 ≥ 3

Rate of leak

3% 15%

Intraoperative Assessment

- Many RCTs support its use.
- The leak rate was reduced from 14% to 4%
- Based upon the results of this large cohort study of **825 patients**, those with positive air leak tests treated with suture repair had higher clinical leak rates (**12.2%**) than patients who received a diverting stoma (**0%**) or underwent reanastomosis (**0%**).
- So, *to enable an accurate repair, the anastomosis should be redone and/or the patient is diverted.*



[Srp Arh Celok Lek. 2011 May-Jun;139\(5-6\):333-8.](#)

Intraoperative air testing of colorectal anastomoses.

[Ivanov D¹](#), [Cvijanović R](#), [Gvozdenović L](#).

[+ Author information](#)

Abstract

INTRODUCTION: Intraoperative anastomotic air testing of stapled colorectal anastomosis is performed by filling the pelvis with saline solution and insufflating the rectum with air through a sigmoidoscope. The presence of air bubbles indicates anastomotic leaks which are resolved during surgery.

OBJECTIVE: The aim of this prospective, randomized study was to perform a comparative analysis regarding the number of anastomotic dehiscences in patients checked by air leak testing and in the control group without air testing.



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Intraoperative Assessment

Endoscopy

- A useful adjunct to air leak testing
- Allows surgeons to assess for mucosal viability, staple line disruptions, bleeding





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Ann Surg. 2007 Aug;246(2):207-14.

Defunctioning stoma reduces symptomatic anastomotic leakage after low anterior resection of the rectum for cancer: a randomized multicenter trial.

Matthiessen P¹, Hallböök O, Rutegård J, Simert G, Sjödahl R.

+ Author information

Abstract

OBJECTIVE: The aim of this randomized multicenter trial was to assess the rate of symptomatic anastomotic leakage in patients operated on with low anterior resection for rectal cancer and who were intraoperatively randomized to a defunctioning stoma or not.

This multi institutional study found that patients who had stoma had significantly less symptomatic leaks (10.3 % vs. 18.0 %; $P < 0.001$) and three times less likely to require an urgent abdominal reoperation



Cochrane Database Syst Rev. 2010 May 12;(5):CD006878. doi: 10.1002/14651858.CD006878.pub2.

Covering ileo- or colostomy in anterior resection for rectal carcinoma.

Montedori A¹, Cirocchi R, Farinella E, Sciannameo F, Abraha I.

+ Author information

Abstract

BACKGROUND: Anastomotic leakage is one of the most important complications that occur after surgical low anterior resection for rectal cancer. There are indications that anastomotic leak is associated with increased morbidity, mortality, frequent re-operation or radiological drainage, and prolonged hospital stay. Defunctioning stoma can be useful for patients undergoing a rectal surgery.

OBJECTIVES: To determine the efficacy of protective defunctioning stoma in low anterior resection for rectal carcinoma.

- This 2010 Cochrane review and a meta-analysis also confirmed the role of a defunctional stoma to reduce the rate of clinically relevant anastomotic leakages and urgent abdominal reoperation.



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When to divert?

- Obese patients,
- Preoperative radiation therapy or
- On steroids, and
- Anastomosis 5 cm or less from the anal verge





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Factors

- **Collagen**

 - Type 1 (68%)

 - smooth muscle cells & fibroblast

- **Wound environment**

 - Peristalsis & movements

 - Aerobic & Anaerobic Bacteria

 - Perfusion

- **Collagenase Activity**

 - 3 days



Diagnosis

- **CLINICALLY**

- Fever and Leucocytosis may be indicative of a leak but actually very common after colectomy.

- **C-reactive protein (CRP)**

- Inflammatory marker with peak levels observed on POD2
- Values below specific cutoffs on POD 3 and 5 are rarely associated with an anastomotic leak.
- Unfortunately, cutoff levels varied (range, 100 to 190 mg/L)
- So, higher levels require further investigations



Imaging

- CT has a major role in the diagnosis of postoperative complications, abscesses, and other fluid collections following abdominal and pelvic surgery.
- But, its sensitivity below 68% in colonic leaks because perianastomotic air/fluid levels are common finding other than extravasation of contrast
- Contrast extravasation on CT is more often identified in the setting of a rectal anastomotic leak, with sensitivity and specificity of 83% and 97%.
- As such, CT of a rectal anastomosis for a suspected leak should generally be performed with rectal contrast.



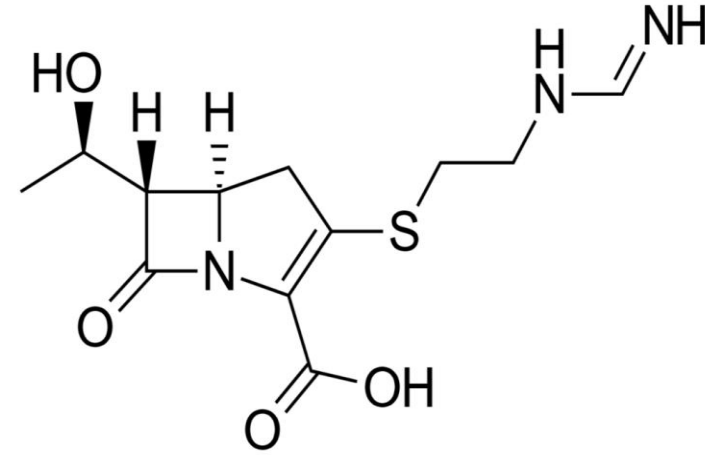
Management

- A quantitative resuscitation protocol targeting specific physiological goals, including;
 - urine output,
 - mean arterial pressure , and
 - serum lactate,should begin within 6 hours of the diagnosis of sepsis-induced tissue hypoperfusion.
- This type of resuscitation has been referred to as **early goal-directed therapy (EGDT)**

Management

Antimicrobial Therapy for <3 cm abscess

- Anastomotic leaks are a type of hospital-acquired (nosocomial) infection that require broad-spectrum antimicrobials.
- Combination therapy with **imipenem** or meropenem and **amikacin** was most recently recommended in the *2015 French Clinical Practice Guidelines*.





Management

Nonoperative Interventions : IR Drainage

- 1/3 to 1/2 of patients with leaks can be successfully treated without an operative intervention.
- Potential patients for this kind of management are those who have:
 - Lower severity leaks
 - Been previously diverted.
 - An extraperitoneal anastomosis (e.g. a low pelvic anastomosis).



Operative Management : Sepsis

Options

- Anastomotic Salvage
- Anastomotic Takedown
- Anastomotic Repair

Anastomotic salvage with loop diversion resulted in statistically fewer;

- Postoperative deaths, Recurrent sepsis, and Permanent stomas than **anastomotic takedown**.

Anastomotic repair : without proximal diversion is associated increased mortality and therefore is not recommended particularly for low pelvic anastomoses

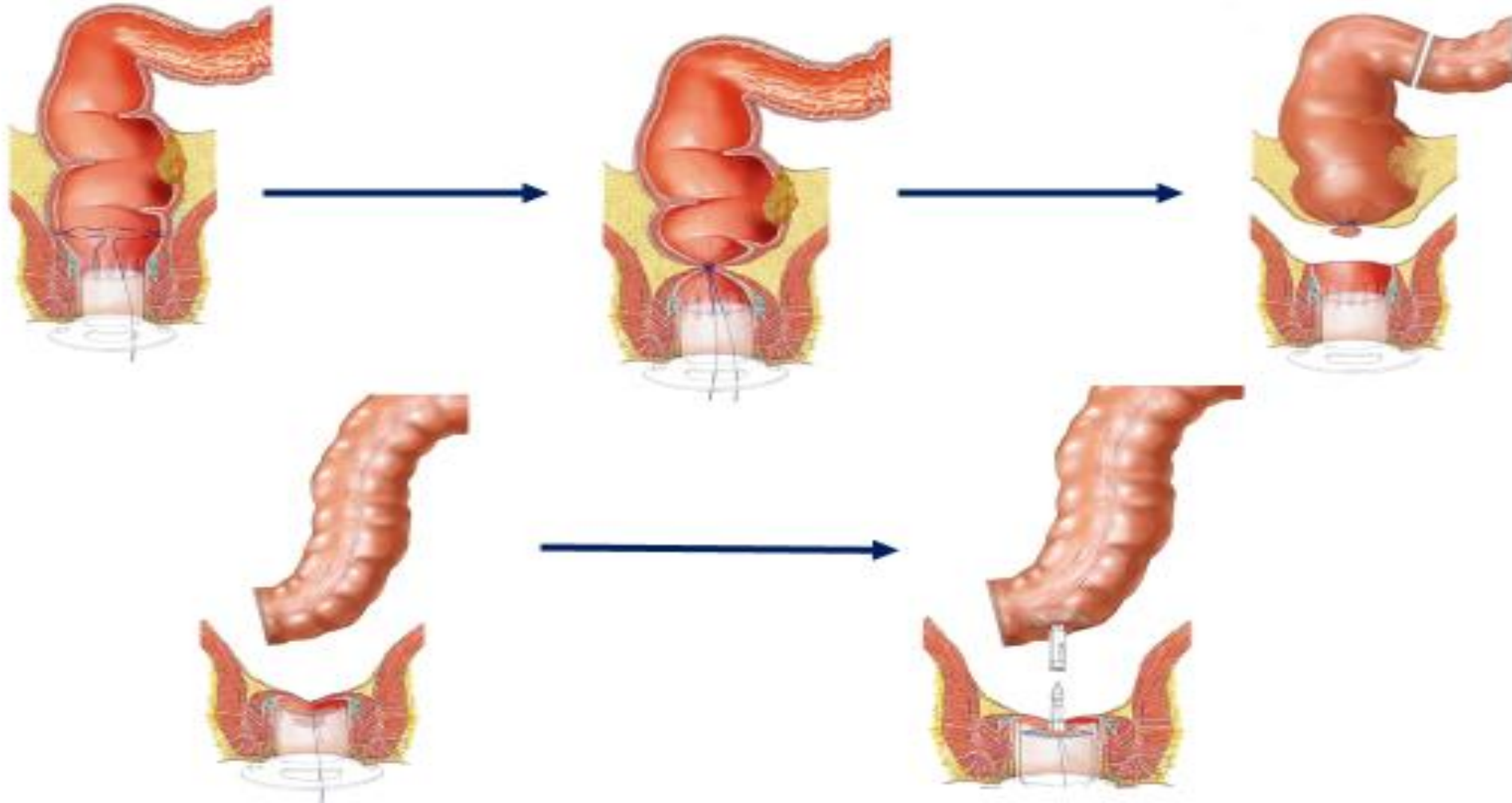


Anastomosis in low rectal cancer

These features present technical challenges during both laparoscopic and open surgeries, due to :

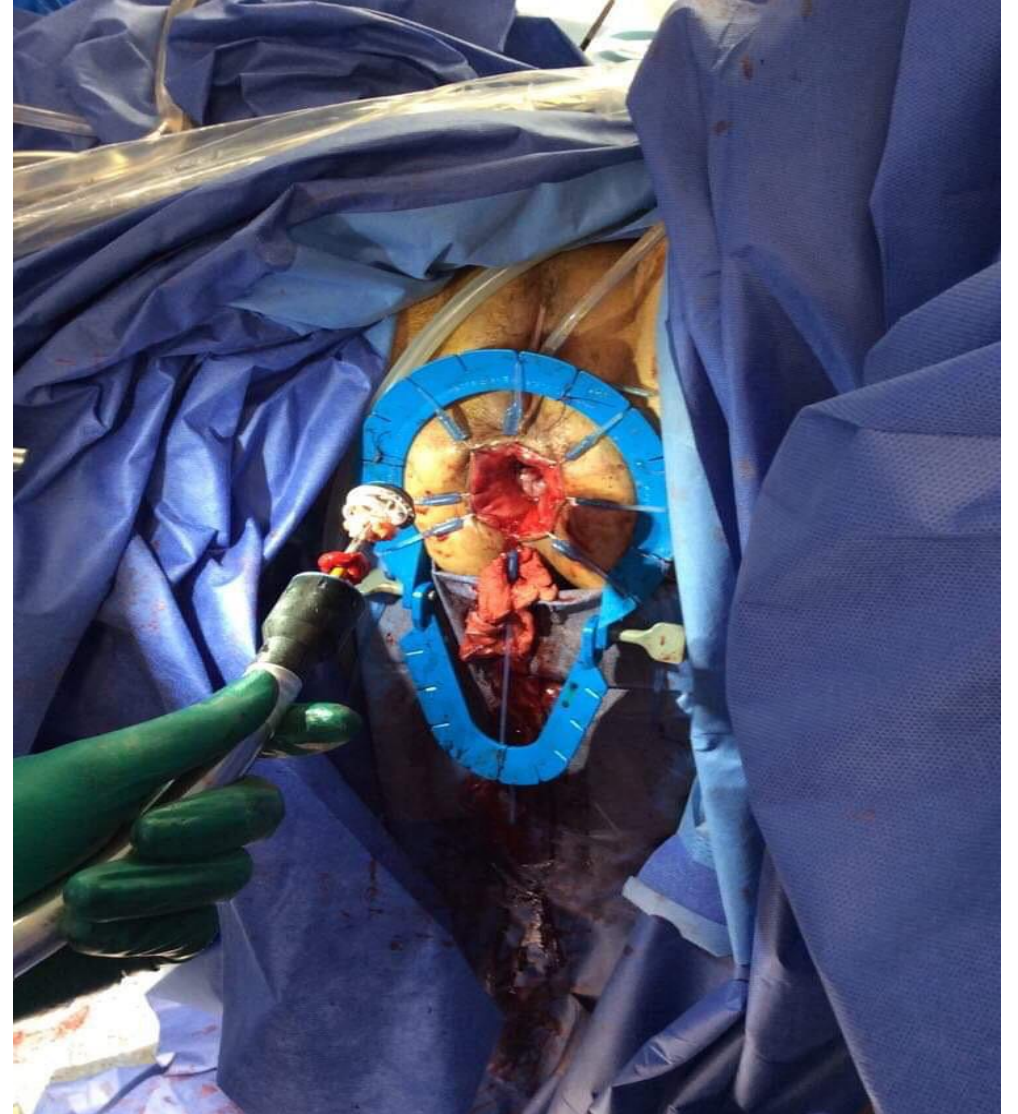
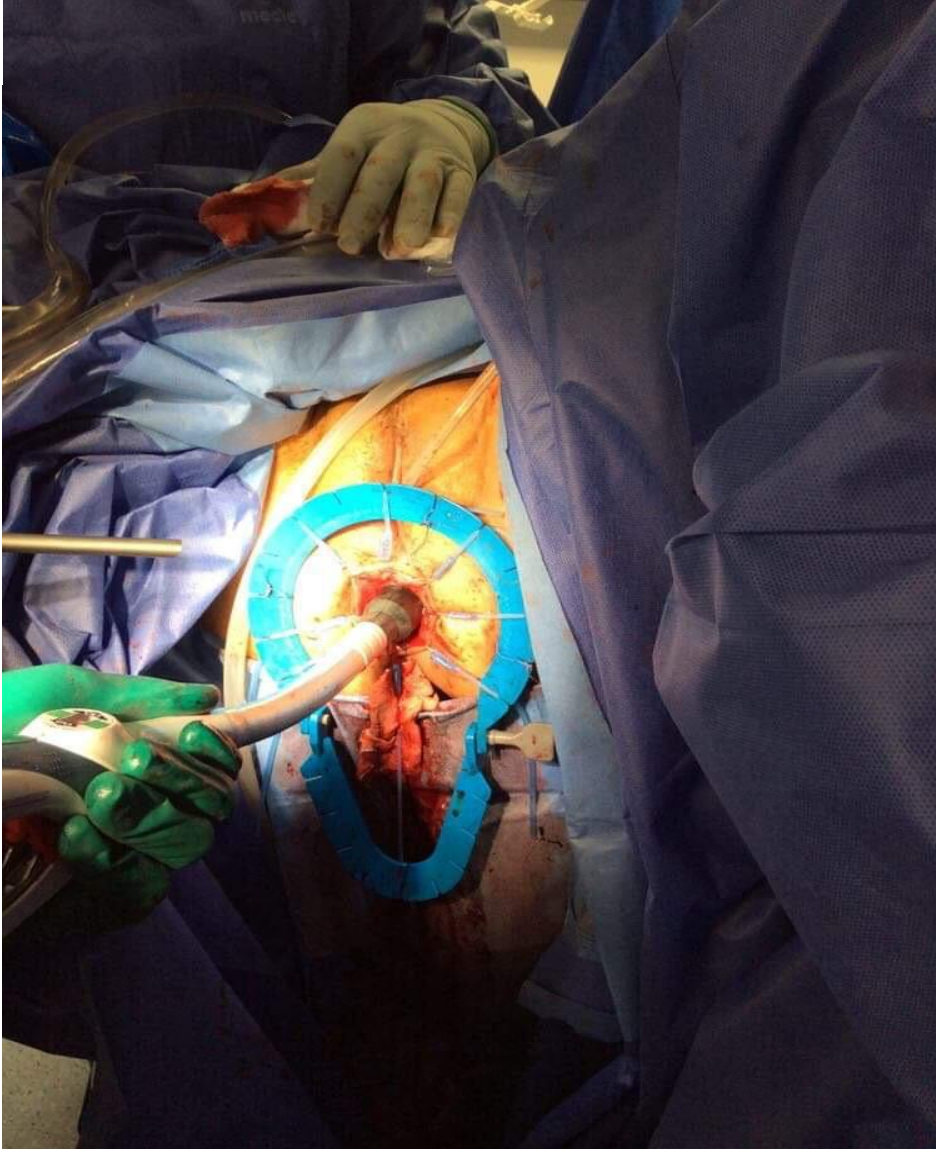
- Poor exposure of the mesorectal plane,
- Difficulty introducing instruments down a narrow space with
- Fixed bony pelvis.

Subsequently can lead to inaccurate dissection and uncertain margins



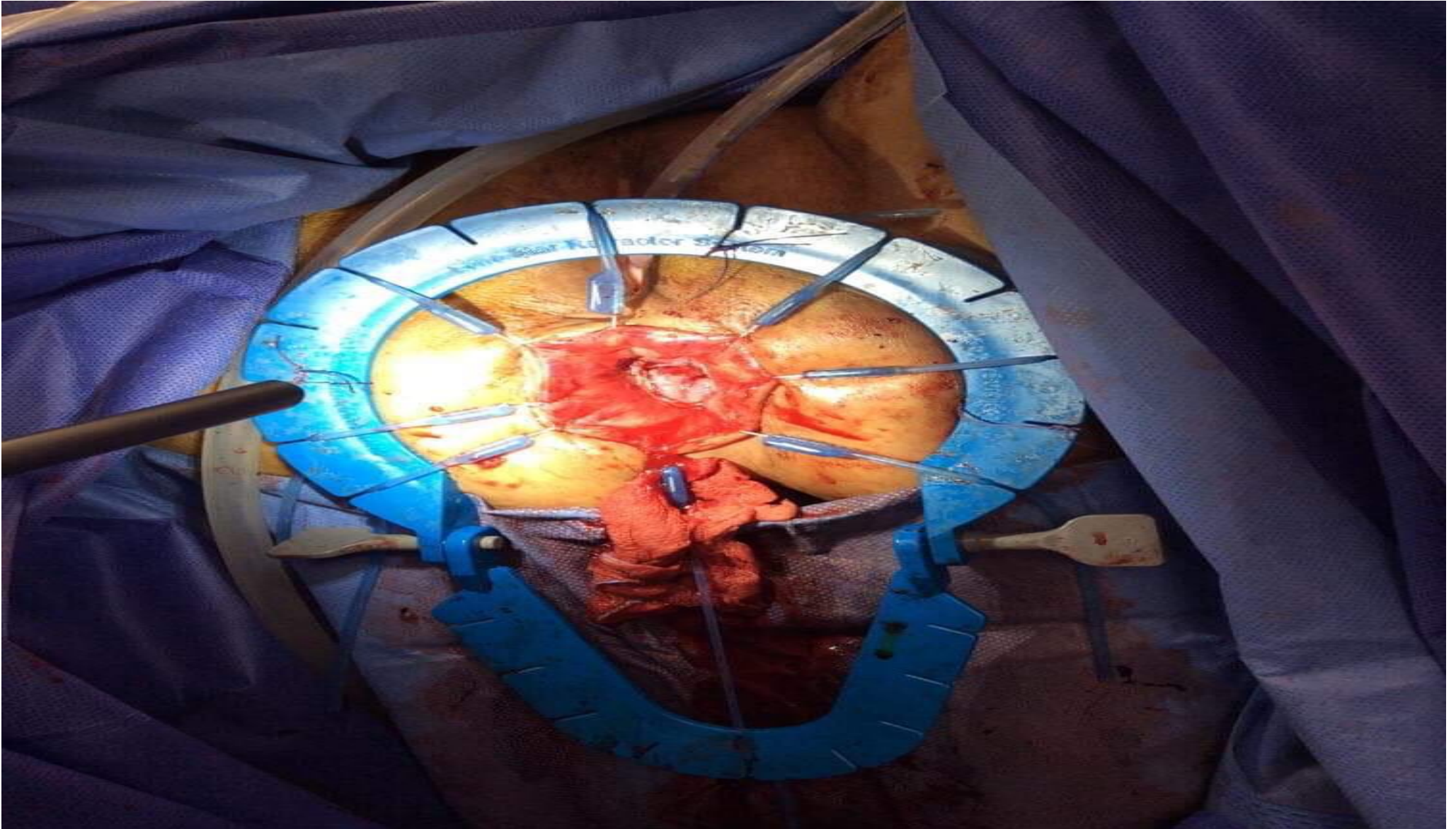


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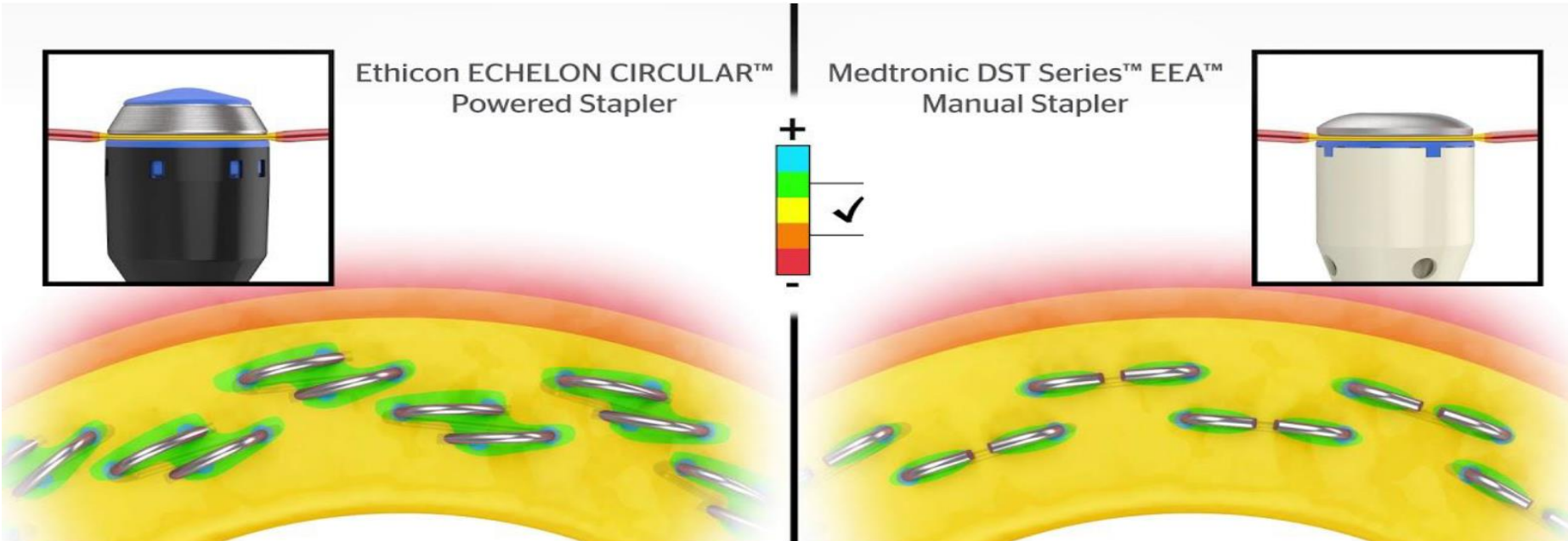




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Over time : different stapler configurations “variations on an old theme”



No head-to-head comparative data !



CASE

- 66 years old presented as bowel obstruction , biopsy showed adenocarcinoma
- Operated anterior resection with primary anastomosis on 14/12.
- On 15/12 CRP raised to 123, then reduced to 80 on 5th day . However patient had Nauseas and Vomiting . CT abdomen showed localized anastomotic leak on 17/12. Patient was put on TPN , NPO and Meropenam. CRP was 53. Had surgical drain which was serous at anastomotic site.
- Abdomen is soft and patient is afebrile
- He tolerated diet and no further vomiting and was passing motion.

CT scans



17/12



21/12



26/12



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Home Messages



- AL have significant consequences for patients and surgeons.
- **Prevention** requires improved understanding of the actual mechanisms by which they occur.
- **Early detection** may diminish the deleterious effects of a leak and allow for greater use of nonsurgical treatments.
- **Reduction in the severity of its complications** may allow surgeons to move away from the liberal use of diverting stomas, a source of substantial physical and psychological morbidity and expense



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2ND EMIRATES INTERNATIONAL COLORECTAL CONGRESS

On 24-25 February, 2024

Conrad Abu Dhabi,
Etihad Towers - Abu Dhabi

www.e-icrc.com

The poster features a blue and white color scheme with a silhouette of the Abu Dhabi skyline, including the Yas Viceroy Hotel and the Etihad Towers, set against a light blue background.

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