INTRODUCTION

Anastomotic leak is a devastating complication that may result not only in severe morbidity and more hospital resources consumption, but can also lead to the demise of the patient, increase the risk of local recurrence and reduces the survive [1-7].

Data regarding diagnosis of this complication and its management are poor and don’t permit to provide a clinical guidance.

This chapter aims to present a mini review about the risk factors, diagnosis and management of AL after colorectal surgery.

Definition

There is no single accepted definition of colorectal AL. In 1991, the United Kingdom Surgical Infection Study Group proposed the definition as a leak of luminal contents from a surgical joint between two hollow viscera [9].

A proposal definition by the international study group of rectal cancer; AL should be defined as a defect of the intestinal wall at the anastomotic site (including suture and staple line of neorectal reservoirs) leading to a communication between the intra and the extra luminal compartments [10].

Prevalence

The prevalence of AL varies from 1% to 20% depending upon anatomical site, pre and per operative factors [1,5,7].

Consideration of risk factors is relevant in the decision-making process. These factors should be classified as modifiable or non-modifiable.

MODIFIABLE OR ADJUSTABLE RISK FACTORS

Some factors are adjustable and lead to lower rates of AL.

Alcohol

Alcohol consumption in excess is associated with an increased risk of AL [1,3,7,8].

Smoking

Current and historical smoking id associated with an increased risk of AL and several studies have demonstrated it as an independent factor [11-15].

Obesity

Several studies have concluded that obesity is also independently associated with an increase risk of AL [16-17].

Medications

Some of the evidence about the relation of medications and AL is weak or contradictory. Prolonged use of Corticosteroids may increase AL by impairing intestinal healing [18,19]. It is unclear if biologic therapy does cause an increase in AL [20-22]. The results of retrospective studies are contradicts and in the Meta analysis of El Hussuna et al., studies with a low risk of bias, anti-tumor necrosis factor alpha agents increased the risk of anastomotic complications [22]. Retrospective studies have demonstrate an increase of AL rate with the use of non steroids.
anti-inflammatory drugs, but after the results of the meta analysis of Bhangu A et al., we can draw any conclusions about this association [23-27].

Nutrition and hypoalbuminaemia

There is a body of evidence that preoperative enteral nutrition and particularly immune-enhancing nutrition decreases the rate of complications in malnourished patients [28-32].

Mechanical bowel preparation

Not preparing the bowel does not appear to have resulted in increased AL in several Randomized Controlled Trials (RCT) and systematic review [33-34]. The Greccar III RCT demonstrated an overall reduction in septic complications in rectal surgery alone in patients receiving bowel preparation, but, there was no difference in AL [35].

Radiotherapy

Neoadjuvant radiotherapy (alone or associated with chemotherapy) are not associated with an increase in AL in several RCT [18]. Also, there was no difference in AL between patients who had earlier vs later surgery following Neoadjuvant treatment [36-39]. Previous pelvic radiotherapy was associated with a high risk of AL in the radiotherapy field. So, consideration should be given to avoiding anastomosis in this situation [5].

Gender and age

Male gender increases the AL rate in both colonic and rectal anastomosis [1,7,9]. Prospective studies [4,40,41] have demonstrated that increasing age is associated with an increase risk of AL, but others failed to find it [3,42]. Most likely, gender influences low anastomosis, where the narrower male pelvis makes dissection and anastomosis more challenging.

Diabetes mellitus

Two studies have demonstrated that diabetes is associated with higher risk of AL (ileo colic anastomosis and low anterior resection) [37,43], but another study didn’t find any difference in AL rate but higher mortality in the AL group [44]. ASA score > 3 was found as a significantly risk factor for clinical AL [3,18,43,44].

Diverticular disease

In the prospective study of Platell et al., the rate of AL was significantly superior with resection for diverticular disease (5.9%) compared to the overall AL rate (2.4%) [45].

INTRAOPERATIVE FACTORS

Tension on or poor vascularity at the anastomotic site are a risk factor of AL. Operative duration more than 4 hours, intraoperative contamination, blood loss and transfusion are risk factors of AL [19].

Technical Aspects

No difference in AL rate between hand sewn and stapling anastomosis in left colonic and rectal anastomosis [46-48], but a meta analysis in Cochrane review has demonstrated a difference between the two techniques in ilene colic anastomosis in favor of stapling techniques [49,50]. No difference also has been noted between open or laparoscopic surgery in AL complications after colorectal surgery [51,52]. The use of air leak test does not reduce the rate of AL but permits immediate technical defects assessment for repair [53]. The use of de functioning stoma and/or omentoplasty may reduce the consequence of AL but the likelihood of AL per se [53,54]. A covering stoma is recommended in low anastomosis, a poor preoperative patient condition, a positive air leak test. Traditionally, Stoma were thought to reduce the septic clinical consequences of AL, but the review of Montedori et al., showed that stoma decrease also the occurrence of leaks [55]. For drainage, irrespective of the site of anastomosis, colonic [56] or infra peritoneal anastomosis [57], many systematic reviews and a Cochrane review don’t demonstrate any difference in term of AL [58].

Diagnosis of AL

Delayed diagnosis of AL is associated with worse outcomes. Clinicians must be aware from subtle signs of AL and particularly non specific signs such respiratory signs, neurologic perturbations and cardiac arrhythmias [59,60]. Raised concentrations of serum C-reactive protein and procalcitonin may be useful sign but no specifics for AL. In a meta analysis of warschkow et al., including six studies, a cut-off of 135 mg/l on 4th post operative day had a negative predictive value of 89% for septic complications [61]. Imaging radiology and especially CT scanning are not essential when the AL is clinically evident. The sensitivity of CT can be improved by the addition of rectal and intravenous contrast. The presence of a collection of fluid and gas neighboring the colonic suture/staples is indicative of an anastomatic leak [62-65].

Different scoring system of grading the severity of AL has been developed, but the international study group of rectal cancer devised the severity of AL in three grades; no intervention, active non-operative intervention and re-laparotomy [10].

Management of AL

No firm evidence is available. The type of treatment depends on the severity of the clinical conditions, the height and the flow volume of the leakage, the time between operation and reoperation, presence of diverting stoma or not. Management requires an assessment of the patient’s clinical stability with fluids resuscitation, antibiotics and oxygen. Next to mortality and morbidity, preservation of the anastomosis should be one of the end points for the surgeon.

Source control: available strategies include observation, percutaneous drainage, endoscopic stenting and surgical revision. Conservative treatment should be undertaken in stable patients and well without evidence of sepsis. Imaging shows no evidence of anastomotic leakage or large perianastomatic collection. In patients with stable hemodynamic status with intrabdominal collection may be managed successfully by radiologically guided drainage with or without defunctioning stoma [62-65]. This radiological approach should not be undertaken in the setting of evidence of complete anastomotic discontinuity or multiple and separate foci of intara abdominal collections. In this case, surgical source control and re-laparotomy is required.

For infraperitoneal AL, the decision depends upon the severity of sepsis, the diffusion or contained peritonitis and the...
importance of the anastomotic dehiscence between washout, drainage, repair of the anastomosis and proximal defunctioning (conservative damage control) or defect and takedown the anastomosis and making a stoma. For extra peritoneal AL, the risk of peritoneal contamination is less little to occur because the majority of patient had a de functioning stoma. The indication of conservative treatment or take down of the anastomosis depends essentially on the presence or not a severe sepsis or septic shock.

Endoscopic prosthesis or placement of vacuum could be also of benefits [66]. In low rectal ALs transanal drainage may be effective. Endoscopic placement of vacuum devices into the presacral cavity (Endo-SPONGE®) may also be of benefit under these circumstances [67].

CONCLUSION

In conclusion, despite the improvement in the perioperative management of colorectal surgery and the substantial morbidity and mortality of AL, surgeon has few available options to reduce the rate of this complication. Cooperative efforts should be made regarding the prevention, assessment and management of colorectal AL.

REFERENCES


