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THE SAFETY OF SINGLE INTERRUPTED EXTRAMUCOSAL SUTURING OF THE BOWEL

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ABSTRACT

Background Leakage from an anastomosis in the gastrointestinal tract is a major complication that is often associated with increased mortality, morbidity and prolonged stay .there are different techniques in suture of bowel anastomosis include.

• Suture– Single layer (interrupted or continuous) – double layer.

• Stapler (linear, circular).

The first one who used this technique (extramucosal single interrupted layer) was halsted, with big argument at that time(1887) about that method. **Objective:** To evaluate the safety of the suturing bowel anastamosis with single interrupted extra mucosal technique. **Patients and Method:** This is a prospective study conducted in Baquba teaching hospital from march 2011 till November 2013 include 154 patients with bowel operation for emergency and elective cause. The bowel was sutured with silk no. 2/0 by single interrupted extramucosal method for anastomosis and perforation. **Results:** There were no leak or dehiscence of suture or fecal fistula and all of patients start oral feeding early with no complications. **Conclusion:** Single layer interrupted serosubmucosal (extramucosal) technique is effective and safe , less time consuming, performed easily, simple technique to teach. less morbidity and mortality.

INTRODUCTION

Leakage from an anastomosis of gastrointestinal tract is a major complication that is often associated with increased morbidity, mortality and prolonged stay.[1] Different techniques of intestinal anastomosis are present:

• Suture

– Single-layer (interrupted or continuous)

– Two-layered

• Stapler(linear, circular)

An argument regarding single versus double layer anastomosis goes back to 1887 when Halsted proposed interrupted extra mucosal suturing. Then Senn in 1893 advised double layer anastomosis. By 1931, more than 52 techniques for G.I anastomosis had been described.[3] Currently single layer extra mucosal anastomosis is popular as advocated by Norman Matheson of Aberdeen as it probably causes the least tissue necrosis and luminal narrowing.[4]

Double layer anastomosis produces mucosal inversion and serosal apposition. The first inner layer is anastomosed but taking suture through all coats of gut wall and in second outer layer, serosa is approximated. The inner layer is believed to be haemostatic but there are chances of strangulation of mucosa due to damage to submucosal vascular plexus.[5] In single layer technique, only seromuscular layer of gut wall is approximated. This technique incorporates the strongest layer (submucosa) of gut and causes minimal damage to the submucosal vascular plexus. The objections against traditional double layer are that it ignores the basic principle to accurately opposing the clean cut edges and large amount of ischemic tissue within the suture line which may increase the incidence of leak and excessive inversion may lead to narrowing of lumen.[6] In contrast, single layer technique, employing extra mucosal sutures allows for accurate opposition, incorporate the strongest layer (submucosa) of gut, causes minimal damage to submucosal vascular plexus and least disturbance to lumen.[7,8] Interrupted single layer is now widely considered to be the gold standard for intestinal anasotmosis.[9]

Anastomotic failure had always been a cause for concern in patients undergoing surgery with gastrointestinal anastomosis, as it adversely affects the surgical outcome. Healing process is dependent on general factors as age, state of nutrition and associated diseases like renal failure, jaundice, malignancy, as well as local factors like vascularity, sepsis and suture technique.[10]

The optimal method of intestinal anastomosis would

• Promote primary healing by achieving accurate alignment of the divided bowel

• Cause minimal disruption of local vasculature
• Incorporate the minimum amount of foreign material
• Not implant malignant cells at the anastomosis
• Not enhance the risk of metachronous cancers.[11]

Experimentally one layer technique has been proven superior to two layer method with respect to luminal reduction, tissue strangulation and strength of anastomosis on the fifth post operative day. Mucosal continuity and muscle realignment on histological examination occurs more rapidly with single layer method. In addition to safety associated with the use of one layer technique there are other advantages, of which most appealing is its simplicity. This is especially apparent in very low rectal anastomosis where a single layer is much easily placed compared to two layer technique in the deep confined space.[12, 13,14,15,16]

Though the general factor plays an important role in the ultimate outcome they may not be correctable all the time. Surgeon may have to operate in a comprised or nearly optimized general condition. This is where safety of technically controllable factor becomes a major determinant of ultimate outcome.

The extra mucosal anastomosis, reappraised by Matheson and Irving, with acceptable morbidity and mortality, may be considered as having many of the attributes of an ideal and safe anastomosis.[17, 18, and 19,20,21,22]

PATIENTS AND METHOD

This is a prospective study conducted in Baquba teaching hospital from march 2011 till November 2013 include 154 patients with bowel operation for emergency and elective causes. The bowel was sutured with silk No. 2/0 by single interrupted extramucosal method for anastomosis and perforation. Both of emergency and elective surgeries are included in the study. The emergency surgeries are due to stab wounds, shell injuries, bullet injuries or blunt trauma. The technique of bowel suturing (perforation or anastomosis) was single interrupted extramucosal using 2/0 silk.

In our study we do not use nasogastric tube and patients start oral sips of water (30 ml) every 1 hour after 24 hours of operative procedures after assurance of positive bowel sounds (assuming that the small bowel function return to normal within 4-6 hours) and providing the patient has no vomiting.

In the next 24 hours the patient asked to increase fluid intake to half a glass (125 ml) every a half hour with an added simple fluid diet.

In the next 24 hours (fourth 24 hours postoperatively), the patient allowed free oral fluid and to have little amount of solid food as well. The patients tested for the development of gastric upset, repeated vomiting or the development of fecal fistula (disruption of intestinal suturing).

The patient asked to stop intake whenever developed repeated vomiting .The patient is considered not tolerating early oral intake when 3 days (72hours) passed and still not able to tolerate the oral intake(fluid or solid).

RESULTS

There were no leak or dehiscence of suture or fecal fistula and all of patients start oral feeding early with no complications.

Table 1: Types of elective surgeries included in the study.

Types of surgery	Number
Closure ileostomy	7
Closure colostomy	22
Total	29

Table 2: Types of emergency surgeries included in the study.

Type of surgeries	single	Multiple	Total
Single or multiple anastomosis in the small bowel	17	16	33
Single or multiple anastomoses in the large bowel	6	4	10
Single or multiple perforations in the small bowel	43	28	71
Single or multiple perforations in the large bowel	6	5	11
Total NO,	72	53	125

DISCUSSION

154 patients undergone intestinal surgery both elective and emergency in baquba teaching hospital from march 2011 till November 2013 were included. They were reviewed for the safety of the technique of single interrupted extramucosal sutu ring of the bowel.

No single patient developed anastomosing dehiscence or fecal fistula. This is in concordance with those of Nadeem Khan, Ata-ur-Rahman, Muzaffar-ud-Din Sadiq and those of Irwin ST, Krukowski ZH, Matheson NA.;they all concluded the safety of single layer suturing of the bowel and it is even superior to double layer

suturing in avoiding fecal fistula. It is also simple and can be performed in shorter time.

CONCLUSION

Single layer interrupted serosubmucosal (extramucosal) technique is effective and safe , less time consuming, performed easily, simple technique to teach and less morbidity and mortality.

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