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General Surgery

Evaluation of superior rectal artery Preservation in Sigmoidectomy for sigmiod colon cancer

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ABSTRACT

Background: In the conventional radical treatment of sigmoid colonic cancer, the ligation of root of inferior mesenteric artery is performed to verify harvesting of D2 and D3 lymph nodes (I.e. intermediate and central lymph node groups) and improve the surgical prognosis. IMA ligation may compromise the blood supply at site of anastomosis and risk injury of autonomic nerve plexus, so preservation of superior rectal artery (SRA) may lead to increase blood flow and decrease postoperative bowel complications.
Aim of the study: evaluation of SRA preservation in open sigmoidectomy for sigmoid colon cancer as regard impact on both radicality and vascularization in the remaining rectum.
Patients and Methods: In this prospective study we do open radical sigmoidectomy on (30 patients) with preservation of SRA for sigmoid colonic cancer to preserve blood supply to the anastomotic site. In the operation, we dissect the trunk of IMA and lymphatic tissue around is dissected out with the tumor.
Results: Lymph nodes harvested 15.2, hospital stay average 8 days (7 d-15 d). There was one case of Post operative leak treated conservatively. There were 5 cases complicated of wound infection treated by antibiotics and daily dressings. Recurrence rate (0%), mean follow up time 18 months.
Conclusion: SRA can be preserved. Although the operation time is slightly increased, but dissected out lymph nodes are comparable with IMA high ligation surgery. Preservation of the SRA seems to be associated with lowering incidence of anastomotic leakage in sigmoid colonic cancer surgery

Keywords: *IMRT; High-Grade Gliomas; limited volumes. spinal.*

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INTRODUCTION

During the classical radical treatment for sigmoid colonic cancer, particularly in patients with advanced diseases, ligature of inferior mesenteric artery (IMA) at its root is often performed to attain better dissection of D2 and D3 (I.e. intermediate & central lymph node groups) and improve the surgical outcomes. However, blood supply to the left colon artery (LCA), sigmoid artery, and superior rectal artery (SRA) is cut after ligating IMA root. Healing of anastomosis is directly get influenced by blood supply which is one of the most vital issues.[1,2] Blood supply to the anastomotic site is an important factor for healing.[3,4]

Preservation of the superior rectal artery (SRA) can increase the blood supply for anastomotic site after sigmoidectomy, which may decrease the incidence of anastomotic Leakage.

Ischaemia or poor blood supply in the anastomosis is a major cause of leakage. Anterior rectal resection syndrome (ARRS) is a complication characterized by incontinence, soiling, fecal urgency and alternation in bowel habits, the main cause of ARRS is denervation of distal colonic segment after sigmoid resection.[5,6,7,8]

Risk of anastomotic leakage which is 3.6% to 6% of patients after colorectal surgery.[9,10,11,12] and its related complications like prolonged hospital stay and adjuvant therapy delay may be reduced by performing any of several strategies, including SRA preservation which described for surgical treatment of sigmoid colonic cancer with adequate harvested lymph nodes.[13,14,15]

Superior and middle thirds of rectum are supplied mainly by the SRA so; by preservation of SRA we can improve blood supply to anastomotic site. Besides, pelvic innervation is preserved, minimizing the risk of

sexual, urinary, and evacuatory dysfunction and avoiding anterior rectal resection syndrome.[6,16]

In this study, we aimed to evaluate the technique of SRA preservation in open sigmoidectomy for sigmoid colon cancer as regards impact on both radicality and vascularization in the remaining rectum.

PATIENTS AND METHODS

This prospective study was conducted by the colorectal surgery team at Al Azhar University hospitals on 30 patients submitted to open radical sigmoidectomy for treatment of sigmoid colon cancer between November 2017 and November 2019.

Inclusion criteria:
1. No known inflammatory conditions.
2. Radical Surgical intervention is the opt line of treatment.

Exclusion criteria:
1. Patients on anticoagulant treatment with altered blood clotting or immune system.
2. Patients having distant metastasis especially in liver.
3. Emergency or palliative surgery.
4. Previous pelvic radiotherapy.

Preoperative preparation:
1. General and local examination performed to know the functions of the whole body for any sign of chronic disease or metastasis also, chronic diseases, anemia or hypoalbuminemia should be controlled and corrected preoperative
2. Preoperative radiological assessment includes ultrasound, CT Abdomen, and pelvis and we may need MRI
3. Tumor markers
4. Colonoscopy
5. Histopathological biopsy examination
6. On the day before the operation, the patient was submitted to bowel preparation by laxatives (fortrans). A third-generation cephalosporin and metronidazole were given for prophylaxis of infection.

Surgical technique:
The surgical approach was medial to lateral, starting by identification of inferior mesentric artery root. Later, the SRA was skeletonized, and also sigmoid branches were ligated (Figure 1). The IMV was not ligated due to small size of the resection; so, the vascular integrity of the SRA was preserved, lymph nodes are dissected from artery and dissected out with the tumor (Figure 2). The colon was resected at the desired level (Figure 3a), followed by primary end to end anastomosis either hand sewn single layer interrupted sutures (Figure 3b) or with 31 or 33mm circular stapler. This was done after confirming the integrity of arc of Riolan, which was done after resection of the colon and during the ligation of the mesocolon when the blood flow of the terminal branches of the arc and bleeding from the colon borders to be anastomosed were verified.

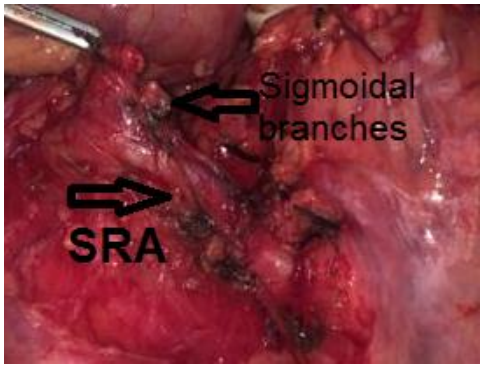

Fig 1: SRA was skeletonized and also sigmoid branches were ligated.

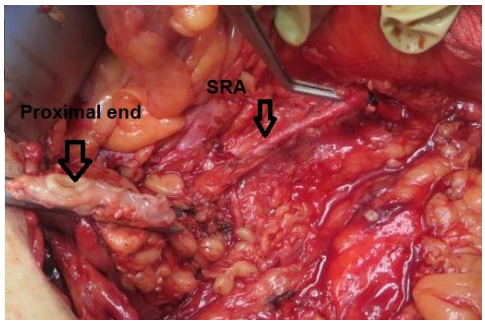

Fig 2: L.Ns are dissected from artery and dissected out with the tumor.

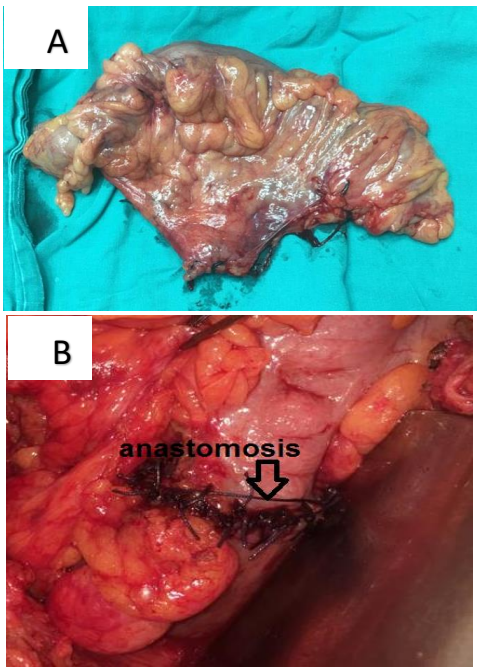

Fig 3: The colon was resected at the desired level (Image A), followed by primary end to end anastomosis either hand sewn single layer interrupted sutures (Image B) or with 31 or 33mm circular stapler.

RESULTS

For the included 40 patients; The median age was 49 years (18 – 68years), male to female percentage was 2:1, 24 patients (60.0%) were presented with ECOG PS 1, while 16 patients (40%) with ECOG PS II. (Table 1)

We enrolled 30 patients in this study between November 2017 and November 2019, results are listed in (Table 1). The mean age of patients 60y (49 -70 y), male patients were 18 patients & females were 12 patients. The mean amount of blood loss was 200cc(150 cc- 350 cc) with no blood transfusion was needed for any patient, the mean operative time 200min.±30 min, lymph nodes harvested 15.2, hospital stay average 8 days (7 d-15 d), oral feeding was started on 4th postoperative day by Liquids then semi solids then solid diet according to acceptance. There was one case of postoperative leak (3.3%) that occurred on the 5th day and treated conservatively. There were 5 cases (16.6%) complicated of wound infection treated by antibiotics and daily dressings. Recurrence rate (0%), mean follow-up time 18 months.

Number of pt.	40
Male	18
Female	12
mean age of patients	60y (49 -70 y)
Tumor depth	
pM	1
pSM	10
pMP	5
pSS	10
pSE	2
pSI	2
Node involvement	
pN0	12
pN1	15
pN2	3
Blood loss	200cc(150 cc- 350 cc)
Mean operative time	200min.±30 min
lymph nodes harvested	15.2
hospital stay average	8 days (7 d -15 d)
Postoperative leak	1
Wound infection	5
Recurrence	0

Table 1: Results data.

DISCUSSION

Risk of anastomotic leakage which is 3.6% to 6% of patients after colorectal surgery (9-12) and its related complications like prolonged hospital stay and adjuvant therapy delay may be reduced by performing any of several strategies, including SRA preservation.

In cases of benign disease, several authors have reported the advantage of preservation of the SRA in preventing anastomotic leakage.(١٨ ,١٧)

Superior and middle thirds of rectum are supplied mainly by the SRA so; by preservation of SRA we can improve blood supply to anastomotic site. In addition, pelvic innervation is preserved, minimizing the risk of sexual, urinary and evacuatory dysfunction and avoiding anterior rectal resection syndrome.(١٦ ,٦)

Radicality in treatment of sigmoid colonic cancer depends on harvested lymph nodes and free surgical margins hence, the prognosis has been influenced .

In this study we achieved two targets, radicality and preservation of SRA.

The mean number of harvested lymph nodes is 15.2 D2 or D3 lymph node dissection which are comparable with other studies with IMA root ligation, which is thought to be enough in treatment of colonic cancer.

IMA root is divided when D3 lymph node dissection is performed, and preservation of the IMA or SRA may lead to insufficient lymph node dissection and contrary to radicality.

Some authors advocate the survival benefit of ligating the IMA at its origin (19) but, there is insufficient evidence to perform high ligation as a standard procedure (20).

CONCLUSION

In this study we concluded that SRA preservation may improve vascularization to anastomotic site contributing to decrease incidence of anastomotic leakage also, to get the radicality, the lymph nodes near the IMA root must be dissected out. If such procedure is done not only radicality is achieved but also improving blood supply to anastomotic site. However, further long-term results are needed.

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