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RESEARCH ARTICLE

Comparison between stapled anastomosis and hand sewn anastomosis in low anterior resection

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Abstract

Colorectal Carcinoma is the most common malignancy in gastrointestinal tract with rectal constituting 30% of cases of colorectalmalignancies. Surgery is the central element in treatment of rectal cancers being the only option for definitive cure.Sphincter saving rectal resection have become standard surgical treatment of rectal malignancies, however restoration of gastrointestinal continuity by means of conventional technique proves technically challenging in case of very low rectal pathology and circular stapling devices have been found to be very safe and efficient alternative to hand sewn suturing technique in these cases.We did a comparative study to assess the onco-surgical outcome of patients of Rectal carcinoma treated with low anterior resection with TME in terms of : a}mortality b}anastomotic leak c} anastomotic stricture formation d}recurrence within 2 years e}operating time using Stapled colorectal anastomosis and Hand sewn colorectal anastomosis.

Introduction

Surgery is the central element in treatment of rectal cancers being the only option for definitive cure[1]. The main aim of treatment is to achieve balance between radicalsurgical resection and need to preserve sphincter function and maintain quality of life .Sphincter saving resection with restoration of bowel continuity is one of the main objective of surgical treatment of rectal cancers. It was introduced first for recto sigmoid tumors ,then for mid rectal tumors and more recently for low rectal tumours[2,3,4] .Sphincter saving resection depends on the distance between tumor and anal sphincter with at least 2 cm of tumor free margin distally.Sphincter saving rectal resections have become standard surgical treatment of rectal malignancies .However restoration of gastro intestinal continuity by means of conventional technique of hand sewn suturing proves technically challenging in case of very low rectal pathology. Circular stapling devices have been found to be very safe and efficient alternative to hand sewn suturing technique in these cases. The factors that influence anastomotic securityrelate both to systemic characteristics of individual patient together with local and technical factors such as adequate blood supply,freedom from tension at anastomotic site,absence of active disease or distal obstruction[5]. The need for edge to edge opposition and adequate luminal patency are self evident[6]. Despite the wealth of circumstantial evidence to suggest that manual suturing and stapling in colorectal anastomosis are essentially equivalent in terms of their safety there have been very little scientific activity to critically examine the comparative features of each technique.[7-12]Various possible benefits that apply to stapled anastomosis such as less tissue manipulation , trauma bleeding , oedema and with a more rapid return of G I function and patient recovery ,ease of performing anastomosis and decreased operating time [13-14]where as cost factor ,increased stricture formation and tumor recurrence are possible drawbacks[15-18].

The present study has been undertaken with main aim of assessing onco surgical outcome of patients treated with low anterior resection with total mesoresectal excision with either stapled or hand sewn colorectal anastomosis in

terms of mortality, anastomotic leak /dehiscence ,anastomotic stricture formation, recurrence within two years and mean operating time .

MATERIALS AND METHODS: From March 2010 to August 2011 a prospective randomizedcomparative study entitled"Comparison Between Stapled Anastomosis And Hand Sewn Anastomosis In Low Anterior Resection" on 58 patients divided randomly into two groups 29each was conducted in the postgraduate Department of Government Medical College Srinager.Five variables were analyzed[mortality, anastomoticleak ,anastomotic stricture formation,recurrence,operating time].All the patients entitled for the study were histopathologicallydocumented,resectable cases of Carcinoma of Mid And Low Rectum. Patients entitled for the study were thoughrly investigated to determine the stage of disease and lymph node status and to exclude metastasis. All the patients entitled for the study were T_2 and T_3 lesions. Among the 58 patients 38 had T_3 lesions and 20 had T_2 lesions. Patients with T_3 lesions received preoperative chemo-radiation over a period of 6 weeks followed by surgery after 6 weeks of gap. In patients who received chemo-radiation a temporary diverting colostomy was fashioned to protect anastomosis. In all the cases anastomosis was created 4 cm above dentate line. Patients excluded from the study included patients with poor preoperative sphincter function,with sphincter invasion ,$T_1$and T_4 lesions with distant metastasis, low rectal tumors with inability to achieve safe distal margin and bulky tumors that cannot be lifted off the pelvic floor. Patients entitled for the study were randomly divided into two groups :Group A(Patients with lower anterior resection(LAR)with total Mesorectal excision(TME)with Stapled Colorectal Anastomosis) and Group B(Patients with lower anterior resection(LAR) and TME with Hand Sewn Colorectal Anastomosis).There was no significant difference in patients in two groups with regard to age, gender ,basic anthropometric data ,preoperative variables ,distance of tumor from anal verge, tumor grade and stage and use of neo-adjuvant chemo-radiation. Among the 58 patients in our study who underwent LAR with TME with primary anastomosis by either of the two mentioned techniques , age of patients varied from 22 years to 72 years,32 patients were males and 26 patients were females. All the anastomosis were created 4cm above anal verge. Five variables were analyzed [mortality, anastomotic leak , anastomotic stricture formation, recurrence within 2 years and mean operating time].Results were recorded and analyzed and stastically significant difference calculated.

Preoperative assessment and preparation: Patients entitled for the study were thoroughly evaluated .History, Examination and all routine baseline as well as specific investigations were done which included CBC,KFT,Na/K,Blood Sugar,LFT, PT/INR,CXR ,ECG,Sigmoidoscopy/Colonoscopy with Biopsy,EGD,USG abdomen and pelvis ,MRI Pelvis and Skeletal Profile .Patients received complete bowel preparation and antibiotic prophylaxis before surgery .

SURGERY: Patients were thoughrly prepared pre-operatively. Patients were positioned in spine position and were catherised. All the cases in our study were done under General Anesthesia. Midline abdominal incision was used in all the patients. Surgery included Low Anterior Resection with Total Mesorectal Excision with End to End Colorectal Anastomosis using Circular Stapler in Group A and Hand Sewn Suturing in Group B.Size of Circular Staplers used varied from 25-31 mm sizes. Pelvic drain was kept in all the patients to drain any collection and to look for any anastomotic leak.Drain was removed on 3-5 Postoperative day on average except in those cases who developed anastomotic leak.Patients were discharged fromhospital after tolerating orals, moving bowels and removing of indwelling catheter and drains on 4 – 6 Postoperative day on an average except those few cases who developed complications .2 patients were reoperated for anastomotic leak out of 7 cases of patients who developed anastomoticleak.Patients were followed postoperatively weekly for 1 month,fortnightly for next 2 months ,monthly for next 3 months ,3 monthly for next 18 months and 6 monthly afterwards.
Stastical methods:All the data was collected ,analyzed and comparison between two groups was made . P Value of variables calculated and Stastical significant difference if any noted.

Discussion and results: Sphincter Saving resections have become the gold standard for surgical treatment of most cancers of middle and distal third of rectum Surgeon nowadays has at its disposal several modes of reconstruction after low resections like direct hand sewn , stapled anastomosis (which can be single stapled , double stapled , or moron triple stapler technique) as well as various pouching methods. Despite the wealth of circumstantial evidence to suggest that manual suturing and stapling are essentially equivalent in terms of their safety,there has been very little scientific activity to critically examine the comparative features of each technique[7-12].James Dochery,JohnMcgregor etl[19] have described that use of surgical stapling instruments is comparable to that of convential suturing in terms of efficacy, applicability and safety. In certain situations staplers offer the facility to achieve reconstructions that will be difficult to achieve manually[20].James Dochery have demonstrated reduction in

incidence of both tumor recurrence and cancer specific mortality for patients in which stapling instruments were used instead of hand sewn technique, whereas there was no difference in anastamotic leakage and mortality. In our study anastamotic leak was more in hand sewn technique whereas there was no difference in mortality and recurrence between the two techniques.Suzane Aegelicaetl[21] demonstrated that stenosis after anastomosis in low ractalmalaganciesis more with stapling whereas time taken for anastomosis is more in hand sewn technique. In several nonrandomized studies greater incidence of stenosis was attributed to stapling devices. In our study stenosis was seen only in case of stapled anastamosis.Laurent A etl[22]showed in their study that stapled anastomosis is significantly faster than hand sewn technique and it should be preferred technique whenever feasible.Simlar results were reported in our study showing significantly decreased time with stapled anastomosis.

RESULTS: The variables analyzed in two Groups of patients are as under: Group A;This group consisted of 29 patients who underwent LAR with TME with Stapled Colorectal Anastomosis.In this group 19 patients had T_2 lesions and received preoperative chemoradiation where as10 patients had T_1 lesions .Among these 29 patients mortality was seen in none of the patients,anastomotic leak was seen in 2 patients, anastomotic stricture formation was seen in 3 patients ,recurrence within 24 months was seen in 2 patients,mean operating time was 140 minutes ranging from 125 to 160 minutes.Group B:In this group 29 patients were operated and surgery included lower anterior resection (LAR) with Total Mesorectal Excision(TME) with Hand Sewn Colorectal anastomosis.Among these patients mortality was seen in none of the patients ,anastomotic leak was seen in 5 patients ,anastomotic stricture formation was seen in none of patients,recurrence at 24 months was seen in 3 patients ,mean operating time was 180 minutes ranging from 165 to 205 minutes.Among the 58 patients divided in two groups 29 of each ,five variables were analyzed and results recorded as:In Group A Anastomotic leak was seen in two patients{7.14%}, Anastomotic stricture was seen in 3 patients {10.7%},recurrence within 24 months was seen in 2 {7.14%} ,Mean Operating Time was 140 mnts +-20 mints,Mortality was seen in none of the patients.In Grioup B patients Anastomotic leak was seen in 5 patients (17.8%),Anastomotic stricture was seen in none of the patients (0%) Recurrence within 24 months was seen in 3 patients(10.7%) ,Mean operating time was 180mints +_20 mints, Mortality in none of the patients.

Table 1:

VARIABLE	**GROUP A**	**GROUP B**	**P VALUE**
MORTATLITY	None	None	1
Anastomotic leak	2	5	.4227
Anastomotic stricture formation	3	None	.237
Recurrence	2	3	.99
Mean operating time	140+-20 mints	180+-20 mints	.0001

CONCLUSION:The results of our study showed that anastomotic leak was more in hand sewn technique whereas stricture formation was exclusively seen in stapled technique with mean operating time significantly shorter in stapled anastomsis.There is no stastical significant difference in mortality and recurrence rate between two groups.This study showed that stapled anastomosis is very efficient ,safe ,technically easy and less time consuming technique for colorectal anastomosis in lower anterior resection(LAR) and is the current standard for anastomosis in LAR.ThusStapled anastomosis in Low –Anterior- Resection can be done with minimum morbidity and mortality and in cases where anastomosis is techniquely very difficult and restoration of gastro-intestinal continuity is difficult.

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