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A Comparitive study of Morbidity and Mortality in Enteric perforation between Primary repair and Primary Ileostomy with delayed closure

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***Abstract**: Perforation peritonitis is one of the most common surgical emergency in India and one of its main cause is Typhoid caused by bacterium Salmonella typhi. The spread of infection is usually by faeco-oral route. In underdeveloped countries like India contamination of drinking water and of edibles are major source. Blood culture is the most important diagnostic method. A serological Widal test detects antibodies against bacteria. Surgical intervention has to be carried out as soon as possible. In our Prospective comparative study done in Department of general surgery in Jay Arogya Hospital and Kamla Raja Hospital associated with Gajra Raja Medical College, Gwalior (M.P.) from 01 july 2010 to 30 June 2011. 100 Patients was treated with different surgical management according to the perforation site, size, number, distance from ileocaecal junction, condition of the gut and intraperitoneal contamination and were divided between two groups, Group 1 in which primary repair of perforation was done and Group 2 in which Primary ileostomy was made. Data was recorded on a predefined proforma which was analysed and interpretation was done by using chi Square test. The level P < 0.05 was considered as the cut off value or significance. Overall Morbidity was 41.02% in primary repair group and 65.57% in primary ileostomy group (p value <0.05) that is morbidity was significantly less in primary repair group. Mortality was 12.82% in primary repair group and 1.63% in primary ileostomy group (p value <0.05) that is mortality was significantly less in primary ileostomy group. In our study we concluded that ileostomy is the life saving procedure, when the life of the patient is at risk in emergency situation due to poor general condition of the gut and the patient. The repair of the perforation can be done in small perforation sufficient away from ileocaecal junction in less contaminated peritoneal cavity with relatively good general condition of the gut and the patient.*

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I. Introduction

Perforation peritonitis is one of the most common surgical emergency in India and one of its main cause is Typhoid. Typhoid fever is an infectious disease caused by bacterium Salmonella typhi. The spread of infection is usually by faeco-oral route. In underdeveloped countries like India contamination of drinking water and of edibles are major source. Incubation period of typhoid fever is about 10 to 15 day. Complications like perforation of intestine occur usually after 10 to 14 days of fever. Blood culture is the most important diagnostic method. Faecal material may also contain organisms, which can be cultured. A serological Widal test detects antibodies against bacteria.Most of the patient when comes for the treatment are toxic, anemic, malnourished and in varying degree of fluid and electrolyte imbalance and shock. Surgical intervention has to be carried out as soon as possible. In healthy circumstances as in strictly localized lesions with a well known etiology and otherwise normal bowel, a simple closure of perforation is warranted. In more advanced cases accompanied with gross peritoneal contamination, bowel resection and anastamosis is recommended, but it yields poor results in seriously ill patients. In such patients, it is advisable to protect the repair or anastomosis by diverting the faecal steram, by making a controlled fistula.Complications are related to every treatment modalities we use to save the patient. Some of complications common to all surgical interventions are wound infections, electrolyte imbalance, septicemia etc. In case of ileostomy some complications are specific to it these are destruction of the peristomal skin, ileostomy prolapsed, ileostomy retraction, parastomal hernia etc.

II. IMaterial And Methods

Study Design: Prospective Comparitive study
Study Location: This was a tertiary care teaching hospital based study done in Department of general surgery in Jay Arogya Hospital and Kamla Raja Hospital associated with Gajra Raja Medical College,Gwalior (M.P.), Madhya Pradesh
Study Duration: 01 july 2010 to 30 June 2011.
Sample size: 100 patients

Inclusion criteria
All patients with diagnosed Enteric perforations of typhoid etiology in which primay repair was done or primary ileostomy was made
Exclusion criteria
1. Patients with perforations of other hollow viscus organ other than enteric site.
2. patiets having the perforations other than typhoid etiology.
3. Patient refused to participate in the study.
4. Patient refused for ileostomy construction in the study.
5. Patient refusal for follow up regularly.

Methodology
After taking well informed consent from patient of suspected peritonitis complete history and detailed clinical examination a battery of routine hematological and biochemical investigation such as Hb%, TLC, DLC, ESR, Serum Electrolyte with calcium, Blood sugar, Blood Urea, Serum creatinine, WIDAL Test, blood culture. HBs antigen test, HIV test. X-ray chest, X-ray abdomen erect posture and USG abdomen was carried out and was recorded on a predefined proforma. After resusitation to optimal condition patients undergoing operation were divided between two groups, Group 1 in which primary repair of perforation was done and Group 2 in which Primary ileostomy was made. Patients was treated with different surgical management according to the assessment of the surgeon in respect to the perforation site, size, number, distance from ileocaecal junction, condition of the gut and intraperitoneal contamination, after which primary closure of perforation in two layers or Primary Ileostomy was made and perforation margin sent for Histopathological examination. Complications were divided into local and systemic and compared. The data were analysed and interpretation was done.
Statistical analysis: The statistical observations of the categorical variables evaluated by using chi Square test. The level $P < 0.05$ was considered as the cut off value or significance.

III. Results

Table 1: Showing Age Distribution of Patients in Primary repair and Primary Ileostomy

S.No.	Age (in yrs)	No. of cases	Group 1	Group 2
1.	<10	02	-	2(3.27%)
2.	11-20	27	13(33.33%)	14(22.95%)
3.	21-30	38	15(38.46%)	23(37.70%)
4.	31-40	22	6(15.38%)	16(26.22%)
5.	41-50	07	4(10.25%)	3(4.91%)
6.	>50	04	1(2.56%)	3(4.91%)
	Total	100	39	61

In our series maximum number of perforations occurred in 21-30 yrs age group i.e. 38%. The youngest patient was 7 years old and oldest patient was 66 years old.The maximum incidence seen in the age group of 21 to 30 years.
Ileal perforation seems to be more common in the males i.e. 77%.
Male: Female ratio is 3.34:1.

Table 2: Showing Clinical Symptoms of Patients in Primary repair and Primary Ileostomy

Sno	Symptoms	No. of cases	Group 1	Group 2
1.	Abdominal Pain	100	39 (100%)	61 (100%)
2.	Vomiting	83	33 (84.61%)	50 (81.96%)
3.	Fever	86	31 (79.48%)	55 (90.16)
4.	Diarrhoea	13	6 (15.84%)	7 (11.47%)
5.	Distention	86	30 (76.92%)	56 (91.80%)
6.	Constipation	83	31 (79.48%)	52 (85.24%)

Abdominal pain was the most prominent symptoms found in all the 100% patients. Fever and Distension of abdomen was seen in 86% whereas Constipation and vomitting was seen in 83% patient respectively. Tachycardia was the most common sign and was present in 86% and hypotension in 66% patients. Tachypnea and Oliguria was present in 46% and 10% patients.

Table 3: Showing distribution of Patient as per Perforation-Operation Interval in Primary repair and Primary Ileostomy

S.No.	Duration	No. of cases	Group 1	Group 2
1.	< 12 hrs	6	3(7.69%)	3(4.91%)
2.	13-36 hr	26	11(28.20%)	15(24.59%)
3.	37-48 hrs	32	10(25.64%)	22(36.06%)
4.	49-72 hrs	12	5(12.82%)	7(11.47%)
5.	73-96 hrs	17	9(23.07%)	813.11%)
6.	≥ 5 days	7	1(2.56%)	6(9.83%)
	Total	100	39	61

Most of the cases 64% come to the hospital within 48 hours of perforation and 76% cases were operated within 72 hours of perforation.

Table4: Showing distribution of Patients according to Site of Perforation in Primary repair and Primary Ileostomy

Sno	Site of perforation from ileo-caecal junction	No. of cases	Group 1	Group 2
1.	< 10 cm	15	0	15 (24.59%)
2.	10-60 cm	73	32 (82.05%)	41 (67.21%)
3.	> 60 cm	12	7 (17.94%)	5 (8.19%)
	Total	100	39	61

Out of 100 patients, in 15% the perforation were located within 10cm from ileocecal junction. In 73% and 12% patients the perforation was located within 10-60 cm and more than 60cm from the ileocecal junction.

Table 5: Showing distribution of patients as per the Operative Procedure in Primary repair and Primary Ileostomy

S.No	Operative procedure	No. of cases	Percentage
1.	Primary repair of perforation	39	39
2.	Primary loop ileostomy	61	61
	Total	100	100

Primary repair of ileal perforation were performed in 39%. Primary ileostomy was made in 61% patients.

Table 6: Showing Local Complications in Primary repair and Primary Ileostomy

Sno.	Complications	Group1 (n =39)	Group 2 (n = 61)	P value
1.	Wound infection	10 (25.64%)	30 (49.18%)	0.016
2.	Primary repair leak	6 (15.38%)	2 (3.27%)	0.02
3.	Skin excoriation	-	30 (76.92%)	-
4.	Ileostomy prolapsed	-	2 (3.27%)	-
5.	Ileostomy retraction	-	2 (3.27%)	-
6.	Obstruction	6 (15.38%)	4 (6.55%)	0.15
7.	Incisional hernia	2 (5.12%)	1 (1.63%)	0.31
8.	Bleeding	-	-	-
9.	Necrosis	-	-	-
10.	Stenosis	-	-	-
11.	Parastomal hernia	-	-	-

Wound infection was the most common post operative complication-about 10 (25.64%) in Group 1 and 30 patients (49.18 %) in Group 2(p value<0.05) i.e significant diference in two procedure. Primary leak occurred in 6 patients (15.38%) cases where as it occurs 02 patients(3.27%) in Group 2 (p value < 0.05).

Table 7: Showing Morbidity and Mortality of patient in Primary repair and Primary Ileostomy

Sno.	Outcome	Group 1 (n=39)	Group 2 (n=61)	P value
1.	Morbidity	16 (41.02%)	40 (65.57%)	0.015
2.	Mortality	5 (12.82%)	1 (1.63%)	0.021

Overall Morbidity in Primary Repair Group1 was 41.02% which was less in comparison to Primary Ileostomy Group 2 having 65.57% (pvalue <0.05) i.e. significant difference in two procedure. Mortality in Primary Repair Group 1 was 12.82% which was more in comparison to Primary Ileostomy Group 2 having 1.63%. (pvalue <0.05) i.e. significant difference in two procedure.

IV. Discussion

Our study consist of 100 patients of surgically verified ileal perforation which were admitted in Department of general surgery in Jay Arogya Hospital and Kamla Raja Hospital associated with Gajra Raja Medical College,Gwalior (M.P.) from 01 july2010 to 30 june 2011and were divided into Group 1 where primary repair was done and Group 2 primary ileostomy was made. The highest percentage of cases was amongst age group 21- 30 yrs i.e. 38% in the present study similar to Eggleston and Santoshi[1] and Singh K.P.et al[2]. Male: Female ratio was 3.34:1 in present study which is consistent with the ratio of 3:1 reported by Wani et al[3], 4:1 reported by Adesunkami and Talwar et al[4].

Abdominal Pain in our study occurred in 100% patients, which is consistent with the study carried out by Chouhan And Pandey[5] they found it in 73.5% cases. Clinical signs such as Tachycardia, tachypnea, hypotension, and decrease urine output and vitals where present in 88.52%, 49.18%, 75.40%, 11.47% patients of primary ileostomy group, they shows that condition of patients of primary ileostomy group was more poor pre operatively. Maximum 28.02% patients of primary group was operated within 13-36 hours and maximum 33.06% patients of primary ileostomy was operated within 37-48 hours. 1 patient expired when primary repair follows after 5 days i.e. 100% patients of this group. There was no mortality in primary ileostomy group when all the 6 patients (9.83%) operated after 5 days i.e.100% recovery.

In our study majority of the perforations were single (80%) similar to study carried out by Adesunkanni[4] and Wani et al[3] majority of the perforations were single. Perforations < 10cm from ileoceacal junction was present in 15% patients and only primary ileostomy was made in them. while perforation at 10-60cm and > 60cm away from IC junction primary repair was done in majority of patients

Wound infection was the most common post operative complication about 25.64% in primary repair group and 49.18% in primary ileostomy group (p value<0.05) that is significantly more in primary ileostomy group.

Primary repair leak occured in 15.38% patients in Primary repair Group in comparison to 3.27 % patients in Primary ileostomy Group (p value < 0.05) i.e. primary repair leak occur significantly more in primary repair patients**.** Overall Morbidity was 41.02% in primary repair group and 65.57% in primary ileostomy group (p value <0.05) that is morbidity was significantly less in primary repair group. Mortality was 12.82% in primary repair group and 1.63% in primary ileostomy group (p value <0.05) that is mortality was significantly less in primary ileostomy group. Faisal Ghani et al[6] reported 13.7% and 3.5% mortality in primary repair and ileostomy group. Nandkarni[7] et al and Leijonwarck[8] also supports exteriorization of the sutured bowel led to a reduction in the mortality.

V. Conclusions

In this study we concluded that the maximum incidence of enteric perforation was found in the patients of the age group of 21-30 years having Male : female ratio of 3.34:1. Temporary ileostomy was advocated in one or multiple perforations near to ileoceacal junction with grossly inflamed gut and contaminated peritoneal cavity. Inspite of need of 2nd surgery in ileostomy patients, ileostomy is the life saving procedure, when the life of the patient is at risk in emergency situation due to poor general condition of the patient when compared to the primary repair in which there is more risk to the life of the patient.The repair of the perforation can be done in small perforation sufficient away from ileocaecal junction in less contaminated peritoneal cavity with relatively good general condition of the patient.

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