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RESEARCH ARTICLE
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FREQUENCY OF LEAKAGE AFTER PRIMARY REPAIR OF TYPHOID ILEAL PERFORATION

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Abstract:
Background: In Pakistan typhoid is found to be one of the common infections and can result in wide array of medical and surgical complications and out of these ileal perforation can be dreadful if not surgically intervened. Post operative anastomosis leak is a matter of concern in such cases.

Objective: To determine the frequency of leakage after primary repair of typhoid ileal perforation

Methods:
Setting: General Surgery Department at Shaheed Benazir Bhutto Medical University/ Chandka Medical College, Larkana Pakistan
Study Design: Descriptive study.
Duration of study: December 2019 to June 2020
Sampling technique: Non probability consecutive sampling

Methodology: In this study the patients between 20 to 45 years of age of both genders with typhoid Ileal perforation within 24 hours undergoing primary repair for typhoid ileal perforation were included. They underwent primary repair and were looked for anastomosis leak which was labeled when luminal contents were seen out of a surgical repair site during first week of surgery diagnosed clinically and confirmed on ultrasound by presence of collection of luminal contents (>100 ml) in the pelvic cavity.

Results: In this study there were total 96 cases. Out of these 50 (52.08%) were males and 46 (47.92%) females. The mean age of the participants was 31.06±6.63 years and mean duration of disease was 14.34±5.51 hours. Anastomosis leak was observed in 5 (5.21%) out of 96 cases. This leakage was seen in 3 (6%) out of 50 males and 2 (4.35%) out of 46 females with p = 1.0. Anastomosis leak was observed in 3 (6.25%) out of 48 cases in age group 20-32 years and in 2 (4.17%) out of 48 in ae group 3345 years with p= 1.0. Leak was more commonly seen in cases with duration of disease 12-24 hours

affecting 4 (8.16%) out of 49 as compared to 1 (2.13%) out 47 cases with duration 1-12 hours with p= 0.36.

Conclusion: Post primary repair anastomosis leak is not rare and is more commonly seen in cases with duration of disease 12-24 hours; though this difference is not statistically significant.

Key words: Typhoid fever, Ileal perforation, Leak, Primary repair

INTRODUCTION:

Typhoid ileal perforation still a significant cause of emergency laparotomies in the developing world. It is causing significant morbidity and the mortality in these parts of the world.

The most common occurrence of typhoid ileal perforation after its onset is found to be in terminal ileum which is secondary to the peyer's patch. 0.8% to 0.18% is the frequency of perforation. The reported mortality rate of typhoid ileal perforation ranges between 5% and 62%. But if the patient report late, the perioperative mortality rates rise up to 80%.

This high rate of the mortality and the morbidity is related to multiple factors. The delay in seeking the definite treatment is the most important and deciding factor. Further, the emergence of the resistant strains of the causative organism is also a significant factor these days. Other factor include inadequate antibiotic therapy, malnutrition of patients, age as mostly patients are young child's, in addition total absence and the scarcity of therapeutic resources [2-4]

New Perforation can be developed postoperatively in patients, mainly due to the receiving of surgical treatment. After the intestinal resection about 5% to 15% patients have been found with anastomotic dehiscence and it is considered as the "catastrophic complication [5-7].".

Due to the complex nature of the disease, the management is also complex. The choice of the procedure of the surgical management of the perforation is complex. It may be a simple closure/repair of the perforation, resection and anastomosis, or intestinal exteriorization as an ileostomy. Not only this but the complication early diagnosis i.e. new perforations, anastomotic and abdominal abscesses can be a major problem/difficulty where there is non-availability of instruments like CT and ultrasound which are mostly not present in rural hospitals at developing countries. [8-10]

This study was conducted to assess the outcome of the primary repair of such ileal perforations in the selected patients, in terms of the anastomosis/repair site leakage.

OBJECTIVE:

To determine the frequency of leakage after primary repair of typhoid ileal perforation

METHODS

SETTING:

This study was conducted in General Surgery Department at Shaheed Benazir Bhutto Medical University/Chandka Medical College, Larkana, Pakistan

STUDY DESIGN:

Descriptive study.

DURATION OF STUDY:

December 2019 to June 2020

SAMPLE SIZE:

SAMPLE SELECTION: 96 patients were included in the study.

Sample technique:

Non probability consecutive sampling

Inclusion Criteria
Patients between 20 to 45 years of age, of both genders who were operated for the typhoid ileal perforation where the perforation was repaired primarily.

Exclusion Criteria
All patients with typhoid ileal perforation who were operated and had gross intra-abdominal collection, or the preoperative parameters like blood pressure, BUN and creatinine were impaired. In these patients, the primary repair of the ileal perforation was deferred.

DATA COLLECTION PROCEDURE:
Subjects were selected from the general surgery department of Shaheed Benazir Bhutto Medical University/Chandka Medical College Larkana. All the patients those fulfilling the inclusion criteria were selected in the study. Written informed consent was taken from all the patients. In all patients complete history and clinical examination by the surgical team and pre-operative evaluation by lab and radiological investigations was done. All the patients those were selected for other surgical procedures were excluded. All the patients underwent primary repair. The antibiotics were given before surgery with 3rd generation cephalosporin (cefotaxime, ceftazidime, or ceftriaxone). Surgeries were performed by a senior surgeon having experience of more than 5 years. All the patients were followed for 7 days after surgery. Any postoperative leakage was noted in all cases. All the data regarding age, gender, postoperative complications and leakage was entered in the proforma.

DATA ANALYSIS
All the data was entered and analyzed in SPSS 20 Version. Mean and standard deviation was calculated for quantitative variables like age and duration of disease. Frequency and percentage was calculated for qualitative variables like gender, and leakage. Stratification with respect to the age, gender and duration of disease was done. Post stratification Chi squire test was applied and *P*-value $\leq$0.05 was considered as significant.

RESULTS:
In this study there were total 96 cases. Out of these 50 (52.08%) were males and 46 (47.92%) females. The mean age of the participants was 31.06±6.63 years. Mean duration of disease was 14.34±5.51 hours.
Anastomosis leak was observed in 5 (5.21%) out of 96 cases. This leakage was seen in 3 (6%) out of 50 males and 2 (4.35%) out of 46 females with p = 1.0. Anastomosis leak was observed in 3 (6.25%) out of 48 cases in age group 20-32 years and in 2 (4.17%) out of 48 in ae group 33-45 years with p= 1.0. Leak was more commonly seen in cases with duration of disease (i.e. severe abdominal pain) was 12-24 hours affecting 4 (8.16%) out of 49 as compared to 1 (2.13%) out 47 cases with duration 1-12 hours with p= 0.36.

ANASTOMOSIS LEAK WITH RESPECT TO DURATION OF DISEASE
n= 96

Duration of disease	**ANASTOMOSIS LEAK**		**Total**
	Yes	**No**	
1-12 hrs	1 (2.13%)	46 (97.87%)	47 (100%)
12-24 hrs	4 (8.16%)	45 (91.84%)	49 (100%)
Total	**05 (5.21%)**	**91 (94.79%)**	**96 (100%)**

p= 0.36

DISCUSSION:
In tropical counties and Indian subcontinent the common surgical emergency is the ileal perforation peronitis. And it is fifth most common emergencies of abdomen because if high incidence of

tuberculosis and enteric fever.[11] Salmonella tyophi is the gram negative bacteria which causes typhoid fever AKA enteric fever. It is one of the major health burden issue in Asia and Africa. In asia the typhoid incidence is about 274/100,000 persons per year. [12]. Feco-oral route is the mode of transmission, and it occurs mostly where sanitation is poor. [13]

Intestinal bleeding is the most common gastro intestinal complication, bit it is managed conservatively and it is not severe but the most serious one is TIP (typhoid intestinal perforation) and its frequency is about 0.8% to 39%. Sub-Saharan counties have found to be have higher propensity to perforation than to asitatic countries[14]. In one of the study it was found that Pakistan and India have highest incidence of enteric fever.[15] The typhoid management very challenge due to late presentation of many reasons which include treatment by quacks, poverty, poor awareness, late diagnosis, poor medical facility and lack of transport facility.[16] In the present study anastomosis leak after the primary repair done in ileal perforation was seen in 5 (5.21%) out of 96 cases. These results were comparable with the findings of the previous studies where almost similar burden of such complication was seen as well. According to a study done by Mittal S et al anastomosis leakage rate was 6.67% which was very close to the findings of present study. [17] This was also supported by the results of the study done in Pakistan by Qureshi et al where they evaluated various surgical outcomes after typhoid perforation repair and it was seen that out of 280 cases studied in their analysis, intra-abdominal collection occurred in 18(6.4%), wound dehiscence in 14(5%), wound infection in 74(26.4%) and anastomotic leakage in 12(4.3%) of the cases. [18]

The data from the other previously reported studies evaluated as overall complication rates in primary repair of typhoid perforation and it was seen as 48% and 34.6% in Indian studies done by Ukwenya AY et al and Chalys PL et al and out of all these studies anastomosis leak was seen in nearly 5% of the cases which was in line with the findings of the present study. [19-20]

According to a study done by Caronna R et al reported no complication in 8 patients of enteric perforation treated with temporary ileostomy vs higher rate in around 20% of the cases managed with primary repair and this low complication rate can be explained by the factor of smaller sample size as compared to present study of 96 cases. [21]

In another study done by Shah AA et al reported 37.5% complication and leakage was seen in 8% of the cases with resection anastomosis. Thus, in comparison with previous studies our complications rate was either equal or relatively low in patients treated with primary repair of the perforation. [22]

In the present study, leak was more commonly seen in cases with duration of disease 12-24 hours affecting 4 (8.16%) out of 49 as compared to 1 (2.13%) out 47 cases with duration 1-12 hours with p= 0.36. There was no such cut off values were used in the past, but the data has shown that the cases with leakage was higher in those that presented late. The data has revealed that patients with severe disease, delayed presentation and very contaminated abdomen had the higher risk of suture leakage but none of these findings revealed a significant association (p= > 0.05) and as was also seen in the present study (p= 0.36). [23]

In another study done by Kouame J et al for primary typhoid repair, postoperative complications were observed in 59 patients (88.1%). The mean hospital stay was 30 days (ranging from 8 to 52 days). The overall postoperative mortality was 34% (22/64), mainly due to digestive fistula in 11 cases (8 cases of anastomotic leak after excision-suture, 3 cases of bowel fistula after conservative resection-ileostomy) and to chronic peristomal ulceration in 9 cases, which led to progressive malnutrition, cachexy and death. [24]

Nisar AR et al did a randomized trial by comparing primary repair (group A) vs ileostomy (Group B) in cases having single typhoid perforation and it was seen that mean duration of hospital stay in group A was 6.5 ±1.1 days and in group B was 9.1 ±2.4 days. In post operative complication, in group A 02 (6.6%) patients developed leakage of primary repair, however, no mortality in group A. In group B 27 (90%) patients developed skin irritation, 04 (13.4%) retraction of ileostomy, 01(3.3%) necrosis and 3(10%) expired. [25]

There were few limitations of this study as this study only looked for one complication i.e. anastomosis leak and didn't include various other commonly encountered ones and also it did not compare the primary vs secondary repair of ileal perforation.
However, there were many strengthening points as well, as this study highlighted the most important complication and also revealing of such low incidence reinforced the plan of primary repair in such cases.

CONCLUSION:

Anastomosis leak is not a rare consequence of the primary repair of the typhoid ileal perforation in selected patients. The risk increases when the patient presents late. Albeit, this difference in the early and late presentation was not statistically different in the current study. A multi-centric study on larger scale is recommended to be conducted in order to assess the anastomosis leak after the primary repair of this common surgical problem.

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