ORIGINAL ARTICLE

Outcomes of Primary Repair in Typhoid Perforation

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Author`s Contribution

[1]Conception, synthesis, planning of research and manuscript writing,
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ABSTRACT

Objective: To determine the outcomes of primary repair in patients with typhoid perforation.

Study Design: Case series study

Study Duration: Study was conducted for 3 year from 15th January 2014 to 15th January 2017.

Methodology: 280 Patients presenting to the emergency department were included according to the inclusion and exclusion criteria via nonprobability consecutive sampling. Written informed consent was taken. The surgical procedure was performed by a senior surgeon having experience of more than 5 years. Postoperatively patient was followed up for ten days and final outcomes (wound infection, anastomotic leakage, wound dehiscence and intra-abdominal collection were assessed clinically and by ultrasound abdomen and was recorded on prescribed Performa. Data was entered and analyzed by using SPSS version 17

Results: The age range was from 15 to 50 years (average age of 25.9 + 9.87 years). Out 280 patients, 108(38.6%) were male and 172 (61.1%) were female. 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%).

Conclusion: The primary repair of perforation is the treatment of choice for typhoid perforation. Early surgery and adequate resuscitation is necessary for successful management of patients with typhoid perforation.

Keywords: Typhoid perforation, primary repair, outcome.

Introduction

Typhoid fever is a severe febrile disease caused by a gram-negative Bacillus Salmonella Typhi which is transmitted by fecal-oral route. It is becoming a major health problem in developing countries due to limited availability of clean potable water and poor sanitation.[1] Its incidence varies in different parts of the world but higher incident reported in developing countries.[2]

Typhoid perforation is a serious complication of typhoid fever which usually occurs at second to third week of disease due to necrosis of payer's patches in terminal ileum and causes severe peritonitis.[3] It carries significant morbidity and mortality in developing countries and is always managed surgically.[4] In Pakistan typhoid perforation remains a frequently fatal disease with high prevalence in remote areas of Sindh.[5] The diagnosis of typhoid perforation is mainly clinical supported by laboratory investigations and radiologically by free gas under diaphragm on erect abdominal x-ray and free fluid on ultrasound and typical perforation in anti-mesenteric border of terminal ileum on laparotomy.[6]

Many surgical techniques have been used for typhoid perforation management ranging from simple peritoneal drainage under local anesthesia (in moribund patient), primary repair, segmental intestinal resection and

anastomosis, ileostomy formation and right hemicolectomy if caecum is involved but results favor primary repair.[7]

Primary repair is favored over resection and anastomosis as in later greater morbidity is reported due to anastomotic dehiscence.[8] The major drawback of ileostomy is the need for second surgery to restore intestinal continuity, longer hospital stay, ileostomy care and attendant cost which reduces its popularity.[9] Primary repair is preferred over all other procedures due to its lower rate of complications such as wound infection 23%, intraabdominal collection 20%, anastomotic leakage 3% and wound dehiscence 6%.[10]

As, no regional census among the expert surgeons exist for the type of management of typhoid perforation to be adopted. Therefore, it is long being realized that primary repair of typhoid perforation in our setup should be adopted. This study was conducted to see that if healing with primary repair occurs with less complications rate in terms of intraabdominal collections, anastomotic leak, wound dehiscence, wound infection than it will have the advantages of avoidance of ileostomy and post-operative ileostomy care, re-hospitalization and re-operation and in terms of cost and morbidity, then primary repair will be adopted by expert surgeons in our setup as a method of choice in management of typhoid perforation.

Methodology

A case Series study was conducted in the Department of surgery Sandeman Provincial Hospital Quetta for the period of 3 years from 15th January 2014 to 15th of January 2017.

A sample of 280 patients was taken by non-probability consecutive sampling technique. The sample was calculated by n= (z2x pq)/d2 where z=1.96 and p= 3%[11] (least amongst all) and d=margin of error keeping it ±2.

Inclusion Criteria: Patient between 15-50 years of age of either gender diagnosed with Typhoid perforation were included in the study.

Exclusion Criteria: Patients having diabetes mellitus, tuberculosis, chronic liver and chronic renal disease were excluded from the study because these diseases interfere in the normal healing of the wound.

Operational Definitions

Typhoid Perforation: Patients with visible hole in terminal ileum on operating table in a patient with a history of raised temperature above 100ºF, constipation of more than 4-5 days and on examination abdominal discomfort.

Primary Repair: Surgical joining between two hollow organs at first operation without any intervening stage.

Outcomes:

1. Wound infection: is characterized as infected if shows any of the following characteristics that is pain (by visual analogue scale that is 0-3 mild, 3-7 moderate, and 7-10 severe) moderate to severe will be considered as pain, redness, significant amount of pus discharge, bad odor and delayed healing of wound (Healing after 7 days).
2. Wound Dehiscence: is parting of all layers of surgical wound showing serosanguinous discharge and gut or omentum protruding from the wound.
3. Intra-Abdominal Collection: is a pocket of infected fluid and pus located inside the abdominal cavity on ultrasound with patient clinically having fever (>100ºF), abdominal distension, hiccups, change in bowel habits (diarrhea).
4. Anastomotic Leakage: Presence of at least four of them will be labeled as positive:

Tachycardia (Heart rate > 100 beats per/min) assessed on ECG, Fever (>100 ºF), Abdominal pain, Drainage from the surgical wound, Pain in the shoulder (score greater than 3 on VAS), Low BP <90/60 and decreased urine output < 400ml/day.

All outcomes were observed at the 10th postoperative day.

The study was conducted in Sandeman Provincial Hospital Quetta for a period of 03 years from 15th of January 2014 to January 2017. As ethical issue committee does not exist in this hospital, permission of conducting this study was taken from the head of the surgical unit. The ethical issues involved were discussed with senior faculty surgeons and was communicated with hospital administration.

All Patients presenting to the emergency department were included according to the inclusion and exclusion criteria. Written informed consent was taken. The surgical procedure was performed by a senior surgeon having

experience of more than 5 years. Postoperatively patient was followed up for ten days and final outcomes (wound infection, anastomotic leakage, wound dehiscence and intra-abdominal collection were assessed clinically and by ultrasound abdomen and was recorded on prescribed Proforma.

Mean and the standard deviation was calculated for age. Frequency and percentages were calculated for gender and outcomes like wound infection, anastomotic leakage, wound dehiscence and intra-abdominal collections. The data were analyzed by SPSS version 17.

Results

The age range was 15-50 with an average age was 25.91 ± 9.8 years. 108(38.6%) of the patients were male and 172(61.1%) were female as shown in table no. 1.

Table 1: Gender distribution of the patients

Gender	Frequency	Percent
Female	108	38.6
Male	172	61.1
Total	280	100.0

Out of 280 patients, 160(57.1%) were illiterate, 113(40.4%) were having primary education and 07(2.5%) were having secondary education, as shown in table no. 02.

Table no. 2: Educational status

Education	Frequency	Percent
Illiterate	160	57.1
Primary Education	113	40.4
Secondary Education	7	2.5
Total	280	100.0

05(1.8%) of the patients belonged to an upper class, 101(36.1%) belonged to middle class and 173(61.8%) belonged to poor class as shown in table no. 03.

Table no. 3: Socio-Economic status

	Frequency	Percent
Middle Class	101	36.1
Poor	173	61.8
Upper Class	5	1.8
Total	280	100.0

18(6.4%) developed the intra-abdominal collection, 14(5%) developed wound dehiscence, 74(26.4%) developed a wound infection and 12(4.3%) developed anastomotic leakage as shown in table no: 04.

Table No. 04. Rate of complications

Complication		Frequency	Percentage
Wound Infection	No	206	73.6%
	Yes	74	24.4%
	Total	280	100%
Anastomotic Leakage	No	268	95.7%
	Yes	12	4.3%
	Total	280	100%
Wound dehiscence	No	266	95.0%
	Yes	14	5.0%
	Total	280	100%
Intra-abdominal Collection	No	262	93.6%
	Yes	18	6.4%
	Total	280	100%

Discussion

In the developing Countries like Pakistan the incident of typhoid is high, therefore due to its high morbidity and mortality with increased incidence the interests of researchers is justified.[9,21-25] There is a universal consensus that typhoid perforation is best treated surgically.[11] A wide variety of surgical treatments have been tried including primary repair, ileostomy and resection and end to end anastomosis. Primary repair of enteric perforation is still the treatment of choice. In our study, primary repair of enteric perforation is considered to be the most effective strategy as it proves helpful for the patient in a number of ways. It is a simple, quick and cost-effective procedure. An ileostomy is more expensive and all the patients carry the risk of morbidity caused due to re-operation for closure and moreover, it needs special care prior to closure.

In term of morbidity and mortality, primary repair is found to be superior to any other surgical procedure especially in severely moribund patients were it proved to be a lifesaving procedure. It is a safe way of managing typhoid perforation and the best treatment option as it ceases the source of further fatal course of illness. This study showed less complication rate in primary repair of enteric perforation which was due to proper pre-operative workup, sound surgical technique and performance of procedure by an experienced surgeon. Thus the operating surgeon has to take multiple factors into consideration before choosing the type of surgical procedure. Probably no single surgical procedure can be universally applicable to all patients with enteric perforation. Every surgical procedure has its own merits and demerits, but when we

compared our experience and the internationally available data, we found that in patients with single typhoid perforation and less contamination the choice of procedure is primary repair.

In previously reported studies, complication rate reported with repair of perforation was 48%by Bhansali[12], 34.6% by Purohitg and 48% by A.R.K. Adesunkanmill. K.P Singh and Kohli[13] reported no complication in 8 patients of enteric perforation treated with temporary ileostomy while overall complication was 44.2%. Shah A.A Wani and Wazir[14] reported 37.5% complication with resection anastomosis. Thus, in comparison with previous studies our complications rate was very low in patients treated with primary repair of the perforation.

In short, the treatment of enteric perforation is always surgical. The patients should be operated upon as soon as possible along with associated vigorous resuscitation and suitable antibiotic therapy. Primary repair of the perforation is the treatment of choice in patients that present early in the course of the disease owing to least rate of complications, shorter hospital stay, quickest and simplest technique, least complication rate and trouble-free post-operative care.

The surgical treatment for typhoid perforation is controversial because there are multiple factors which are to be taken under consideration.[15,16] The types of surgical treatment recommended in the literature includes primary repair; simple excision of the edges of the perforation and closure; wedge resection and closure; segmental resection with primary end-to-end anastomosis; and right hemicolectomy with ileocolic or ileotransverse anastomosis.[10,16] Generally we can say that there are two surgical procedures, the primary repair and intestinal resection with anastomosis. Some authors like Rahman and Atamanalp[10,21] found no correlation between the surgical procedures adopted and complication rate while others[27,28] have found the rates of mortality and morbidity in resection-and-anastomosis patients lower than in primary repair patients. On the other hand Beniwal has suggested primary repair as the first choice of treatment[7], as have others who reported a reduction in complication rate as well as mortality. [9,10,13,18,26,29-32] Ileostomy can might be proposed among the options but we believe that it should be reserved for selected, were there is seriousness in term of macroscopic condition of the intestine, due to both typhoid disease and due to peritonitis which is basically due to negligence for hours or days, making any kind of repair impossible.[10,25]

Conclusion

Typhoid fever and its complications remained an important cause of deaths in poorly resourced countries due to lack of proper health education. The primary repair of perforation is the treatment of choice for typhoid perforation. Early surgery and adequate resuscitation is necessary for successful management of patients with typhoid perforation. Early repair of the perforation is a better procedure in enteric perforation due to its cost-effectiveness and lower rate of complications as compared to other surgical procedures.

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