Document heading doi: 10.21276/apjhs.2019.6.2.14 **Research Article**

Role of abdominal drains in perforated peptic ulcer patients: A prospective randomized controlled study

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Abstract

Background: Perforated peptic ulcer is a common emergency condition worldwide, with associated mortality rates of up to 30%. Although Helicobacter pylori and use of non-steroidal anti-inflammatory drugs are common causes, demographic differences in age, sex, perforation location, and underlying causes exist between countries, and mortality rates also vary. The routine to date has been to leave two tube drains: one in the Morrison's pouch and one in the pelvis after omental patch closure. This study was conducted to test the efficacy and safety of drain usage routinely after peptic ulcer perforation closure with omental patch technique. Materials & Patients: This is observational study was carried out at our rural Medical College in Bihar from the period October 2015 to June 2017. The aim was to know use of abdominal drain in peptic perforation (D1). As matter of study 50 cases was studied it was seen that there is more chance of infection after abdominal drain and less infection noticed in the case without drain. Mortality rate is more in laparotomy with drain. Clinical parameters: a) post operative fever, b) abdominal distension, rigidity, pain; c) post operative diarrhoea and d) vomiting were noted. Per rectal examination to detect boggy swelling or collection in the pelvis was done. Routine haematological and biochemical investigations were also evaluated. Wound infection, burst abdomen, time of return of bowel function, drain site infection and details of drainage were noted. Results: The mean age (mean± S.D.) of the all patients was 42.20±8.52 years with range 25-67 years and the median age was 41 years. In group A, the mean age (mean± S.D.) of patients was 44.36±9.54 years with range 32-67 years and the median age was 42 years. In group B, the mean age (mean± S.D.) of patients was 40.04±6.89 years with range 25-55 years and the median age was 40 years. In group A, per rectal examination to see pelvic collection postoperatively was observed in with drain patients 6 (24%) and without drain patients 8 (32%) but this association was not statistically significant (p = 0.53). Burst abdomen was significantly higher in with drain patients number is 4 patients (16.0%) than without drain patients 0 (0.0%) and this association was statistically significant (χ2= 4.34, p=0.03). Conclusion: So our conclusion is that, if the proper toileting of the abdominal cavity can be achieved with care there is no role of putting abdominal drains as prophylactic drainage, in cases of perforated peptic ulcer diseases mainly D1 perforation.

Keywords: Peptic ulcer, perforation, abdominal drains, prophylactic drainage

Introduction

Peptic perforation is the second most complication of peptic ulcer disease[1].

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It is a serious condition where an untreated peptic ulcer can burn through the wall of the stomach or other areas of gastrointestinal tract.

Perforated peptic ulcer is a surgical emergency and is associated with short-term mortality in up to 30% of patients and morbidity in up to 50%[1].As the peptic ulcer perforates it allows the digestive juice to gain entry into the abdominal cavity[2].The penetrating peptic ulcer will penetrate through the duodenum into the free peritoneal cavity and elicit a chemical peritonitis[2].

Patients of peptic perforation usually presents with upper abdominal pain to start with. Patient can typically recall the exact time of onset of abdominal pain. As time passes the pain abdomen is accompanied by the onset of fever, vomiting, and respiratory distress[3].As time progress peritonitis starts to build up and pt experiencing pain all over abdomen. Clinical examination shows tachycardia, low blood pressure, and dehydration. Per abdominal finding reveals an exquisite tenderness all over abdomen, absent intestinal peristaltic sounds, card board rigidity of the abdomen, positive rebound tenderness, most importantly obliteration of liver dullness[2].A hallmark of free perforation is the demonstration of free air underneath the diaphragm on an upright chest radiogram[2].Many of the perforated ulcers have been attributed to the bacterium Helicobacter Pylori. The incidence of perforated ulcer is steadily declining, though there are still incidences where it occurs. Causes of peptic ulcer disease include smoking, and non steroidal anti inflammatory drugs[4].Peptic perforation mainly D1 perforation, the deadly complication of peptic ulcer disease is a surgical emergency. After the diagnosis is made, operation is performed in an expeditious fashion following appropriate fluid resuscitation[5,6]. Surgery is almost always indicated, although occasionally non surgical treatment can be used in stable patients without peritonitis if there is sealed perforation[1,6]. But in our study we are only considering D1 perforation with features of peritonitis. Here we are only considering simple Graham's patch repair. About 45-50 cases are being treated at M G M Medical College and Lions Club Kishanganj Bihar each year. There has been an ongoing discussion about the requirement of routine use of abdominal drains in post operated cases of simple omental patch repair of D1 perforations. Our study designed to investigate the pros and cons of the use of abdominal drain in peptic perforation patients undergoing Graham's patch closure considering D1 perforation.

Methods & patients

Study Area– Department of General Surgery, MGM Medical College and Lions Club, Kishanganj Bihar

Study Population- Patients admitted in surgical indoors

Study Period- 1½ years

Sample Size– As this is a pilot study formal sample size calculation has not been performed. However, we proposed to recruit 25 subjects in each arm during the study period.

Inclusion Criteria:

- Patients of peptic perforation (D1 perforation) admitted in surgical indoors within 48 hrs of onset of symptoms & repaired with Roscoe Graham patch closure.
- Patients of 18-65 years of either sex undergone emergency surgery and willing to give written informed consent were included.

Exclusion Criteria:

- Age out of range [<18yr and >65yr]
- Patient having known bleeding diathesis
- Patients with traumatic gastric/ duodenal perforation
- Malignant pathology
- Patients with any other hollow organ perforation
- Patients with chronic liver failure / renal failure / congestive cardiac failure
- Pregnant women
- Any other clinical condition perceived by the investigator as not conducive to be included in the study

Study design- Prospective randomized controlled open label study

Parameters to be studied

The study was initiated only after receiving approval from the institutional ethics committee. Subjects fulfilling study selection criteria were enrolled only after taking written informed consent. Subjects were randomized into two study groups with equal allocation ratio using computer generated random number list.

Clinical parameters: a) post operative fever, b) abdominal distension, rigidity, pain; c) post operative diarrhoea and d) vomiting were noted. Per rectal examination to detect boggy swelling or collection in the pelvis was done. Routine haematological and biochemical investigations were also evaluated. Wound infection, burst abdomen, time of return of bowel function, drain site infection and details of drainage were noted. Amount of drainage, mean time of drain removal (drain removed on 5th postoperative day in all cases in Group-A cases those are given drains) and nature and colour of drainage fluid was noted. Mean duration of hospital stay, drain site pain was noted. Abdominal USG done on 3rd post operative day to evaluate pelvic and abdominal collection in both groups (Group-A and Group-B) was done.

Study techniques: A single drain was placed in the pelvis. It was abdominal drain kit no. 32. The exit shall be through the most dependent part of right side of the abdomen. Correlation of history, clinical, radiological findings and analysis of the findings in the form of percentage was done.

Results

In this study 50 patients with peptic perforation (D1 perforation), who admitted in General Surgery indoor in MGM Medical College and Lions Club Kishangang Bihar, India from, October 2015 to

March 2017 were included. Information of these patients was maintained in Department of General Surgery of M.G.M Medical College & L.S.K Hospital, Kishanganj, Bihar. Then the patients were divided into two groups, First group (Group-A) comprised of 25 patients with abdominal drain given during operation. The second group (Group-B) comprised 25 patients who were diagnosed with peptic perforation (D1 perforation), without putting drain in the right pelvis after operation. Data was collected from each peptic perforation (D1 perforation) patient in regards to age, sex, date of admission, date of operation, mortality, wound infection, drain site infection, duration of hospital stay, postoperative fever, return of bowel activity after postoperative days, average drain output and the nature of the collection, per rectal examination to detect any pelvic collection, postoperative USG evaluation to detect abdominal and pelvic collection, postoperative nausea vomiting, postoperative abdominal pain, postoperative abdominal distension, drain site pain and burst abdomen in data proforma. The mean age (mean± S.D.) of the all patients was 42.20±8.52 years with range 25-67 years and the median age was 41 years. In group A, the mean age (mean± S.D.) of patients was 44.36±9.54 years with range 32-67 years and the median age was 42 years. In group B, the mean age (mean± S.D.) of patients was 40.04±6.89 years with range 25-55 years and the median age was 40 years.

Table 1: Per rectal examination to see pelvic collection of two group patients

Per rectal examination to see pelvic collection	With Drain	Without Drain	Total
No	19	17	36
Row %	52.8	47.2	100
Col %	76	68	72
Yes	6	8	14
Row %	42.9	57.1	100
Col %	24	32	28
Total	25	25	50
Row %	50	50	100
Col %	100	100	100

In group A, per rectal examination to see pelvic collection postoperatively was observed in with drain patients 6 (24%) and without drain patients 8 (32%) but this association was not statistically significant (p = 0.53) [Table 1].

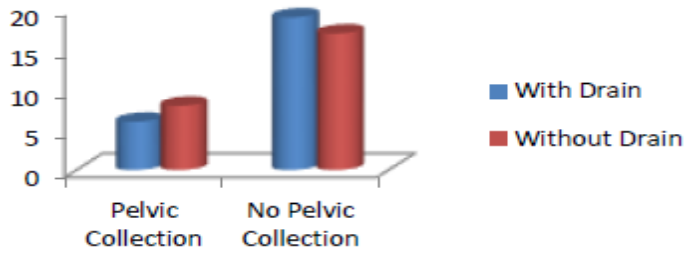

Fig 1: shows per rectal examination to see pelvic collection of two group patients

Table 2: USG whole abdomen to see abdominal and pelvic collection done 3rd postoperative day of two group patients

USG whole abdomen to see Abdominal and pelvic collection done 3rd post operative day	With Drain	Without Drain	Total
Mild Pelvic, Interloop	5	4	9
Row %	55.6	44.4	100
Col %	20	16	18
Mild Pelvic	4	3	7
Row %	57.1	42.9	100
Col %	16	12	14
Total	25	25	50
Row %	50	50	100
Col %	100	100	100

In group A, 5 patients (20.0%) showed mild pelvic & interloop collection, 4 patients (16.0%) showed mild pelvic cle, 9 patients (36.0%) showed minimal pelvic cle, 6 patients (24.0%) showed moderate pelvic cle and 1 patients (4.0%) showed no cle. In group B, 4 patients (16.0%) showed mild pelvic & interloop cle, 3 patients (12.0%) showed mild pelvic cle, 13 patients (52.0%) showed minimal pelvic cle, 1 patients (4.0%) showed moderate pelvic cle and 4 patients (16.0%) showed no cle, but this association was not statistically significant (χ^2= 6.35, p= 0.17) [Table 2].

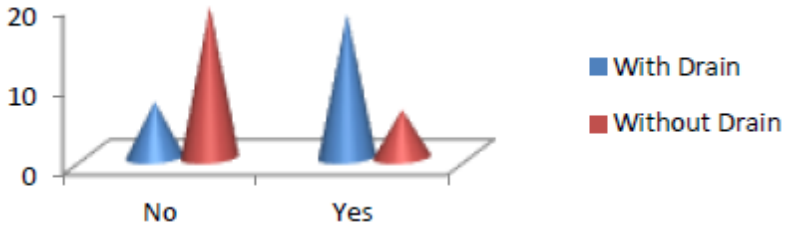

Fig 2: Post operative nausea vomiting of two group patients

Table 3: Post operative abdominal pain of two group patients

Post operative abdominal pain	With Drain	Without Drain	Total
No	2	12	14
Row %	14.3	85.7	100
Col %	8	48	28
Yes	23	13	36
Row %	63.9	36.1	100
Col %	92	52	72
Total	25	25	50
Row %	50	50	100
Col %	100	100	100

Post operative abdominal pain was statistically higher in with drain patients 23(92.0%) than without drain patients 13 (52%) and this association was statistically significant (χ^2= 8.03, p= 0.004) [Table 3].

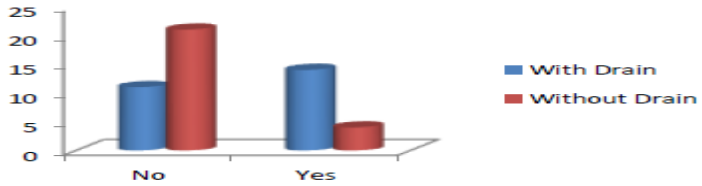

Fig 3: Post operative abdominal distension of two group patients

Table 4: Burst abdomen of two group patients

Burst abdomen	With Drain	Without Drain	Total
No	21	25	46
Row %	45.7	54.3	100
Col %	84	100	92
Yes	4	0	4
Row %	100	0	100
Col %	16	0	8
Total	25	25	25
Row %	50	50	100
Col %	100	100	100

Burst abdomen was significantly higher in with drain patients number is 4 patients (16.0%) than without drain patients 0 (0.0%) and this association was statistically significant (χ^2= 4.34, p=0.03) [Table 4].

Discussion

Omental patching began in 1937, when Dr Graham of Toronto reported 50 cases of perforated peptic ulcer successfully treated with omental patches. In Dr Graham's initial cases, he concluded that routine gastroentorostomy was unnecessary, the omental patch was more than sufficient for closure of the duodenal perforation[7,8].

Robinson aptly classified surgeons into three categories based on their use of drain: those who believe that all intra peritoneal operations should be drained, those who feel that drainage is useless and those who sit on the fence and insert a drain as a safety valve or perhaps as a sop to their consciences[9,10]. All drains are potentially dangerous and the natural history of a drain is to malfunction[9]. When a collection does occur, it is more likely become infected if a drain is present. Duodenal surgery with omental patch technique for perforated duodenal ulcer appears to be safe without prophylactic drainage, and routine drainage cannot be recommended after this procedure (recommendation grade B)[11]. Theodor Billroth was convinced that prophylactic drainage of the peritoneal cavity saved many lives after GI surgery[12]. Other contemporaries believed that drainage of the peritoneal cavity is impossible and, therefore, prophylactic drainage is useless[11]. Petrowsky et al concluded that the "omental patch technique for perforated ulcer appears to be safe without prophylactic drainage, and routine drainage cannot be recommended". Petrowsky et al also says "A Futile Reliance on the Drain, When a Leak develops, postponses life saving reoperation and hastens death[13].Ansari et al showed that the use of drains in a mild or moderate clinical condition, caused by perforated peptic ulcer, is not beneficial and drain related morbidities are usually underestimated[14]. Several complications, resulting from drainage, are discussed. These include severe tissue reactions, leakage from bowel anastomoses, obstruction and perforation of small or large bowel, herniation, leaving behind a foreign body, severe bleeding and the induction of infection. Several of these complications are illustrated with case histories. Moreover a review of the literature on the subject is given. In view of these complications, the author warns against too liberal or too long drainage procedures[15]. The history of abdominal drainage is as old as the History of surgery. However abdominal drainage has always been a subject of controversy, practice in confusion and subjected to local dogmas. Peptic perforation closure with omental patch technique is safe without prophylactic drainage and a high rate of drain-related morbidity negates the concept of the routine drainage after this procedure[16]. In a questionnaire carried out by Moshe Schein, 80 percent of the surgeons answered that they would not leave a drain after primary suture and omentoplasty in peptic perforation[14]. It has been considered that surgically placed drains provide a risk of intra-abdominal infections by providing a route for ascending infections[17]. The rationale behind abdominal drainage following major abdominal surgery has been the value afforded by drains in forewarning the surgeon of potential intra-abdominal complications[18].

Traditionally, surgeons have resorted to placing multiple drains. However, drains have been implicated in the causation of local pain, ascending infection via the drain, interference with patient ambulation[19,20]. Sheng et al, stated that Nosocomial infections have a significant impact on the length of hospital stay and medical care cost[21]. Pessaux P et al suggested that drains act as a foreign body and increases the risk of infection[22].

Conclusion

From my study it is obvious that the incidence of wound infection, drain site infection, burst abdomen, postoperative fever, postoperative abdominal pain, drain site discomfort and pain, post operative nausea vomiting, post operative abdominal distension are significantly higher in with drain group (Group A) in comparison to non drain group (Group B).Abdominal drain act as a foreign body and induce more infection in Group-A patients. There may occur ascending infection through the drains from the exterior to the drain site, drain tract and peritoneal cavity resulting in increased infection in Group A patients. Increased infectious complications offer more morbidity in Group A patients.

Extra puncture wound for introduction of abdominal drains leads to some degree of discomfort to Group-A patients. Even maximum patients show drain site pain. Drain site pain and discomfort lead to more immobilisation and morbidity to the patients of Group A. Even both group patients show significant amount of intra abdominal collection as depicted by ultrasonographic evaluation. This suggests that drain do not function properly to evacuate the peritoneal cavity post operatively. It can be concluded that natural history of the drain is to malfunction. Digital rectal examination also revealed mild pelvic collection in both arm. This suggests that even after placement of drains, collection persists.

Our results showed that duration of hospital stay is higher in with drain group (Group-A) in respect to non drain group (Group B) patients. Time taken for the return of bowel function was higher in Group A

patients. This suggests that postoperative ileus was more frequently observed in this group. There was no evidence of post operative leaks, gross contamination by pus, excessive haemorrhage during careful observation of abdominal drainage bag every day. This suggests that there were no post operative leaks, gross contamination of abdominal cavity and intra abdominal bleeding. Mean amount of collection in the drainage bag was low. In this modern era, we have sufficient equipments to detect intra abdominal complications posts operatively like CT scan and ultrasonography. Putting abdominal drains to detect intra abdominal complication is no more relevant today.

The role of therapeutic drains is not in doubt. The role prophylactic drainage is much more uncertain today. Despite being an established part of surgical practice, there is little evidence to support the routine use of prophylactic drainage. In all areas of gastrointestinal surgery, evidence exists of Grade B or better that drain placement has no demonstrable benefit. In some cases, drains may even be detrimental such that my study shows. Drain related mortality is more in drain group patients according to our study. In practical terms all the drains are given to serve some purpose. If the drains fail to fulfil the work for which they were given, they should be removed as early as possible. Recently, the role of drain usage after abdominal surgeries have begun to be questioned and many surgical interventions that were accompanied with abdominal drains in the past like gastric resection, colon resection-anastomosis, liver surgery, splenectomy are now being carried out without drains.

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