

# Experience of Graham's Patch Omentoplasty for Duodenal Perforation in Azad Kashmir

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## ABSTRACT

**Objective:** To evaluate the etiology and clinical presentation of duodenal perforation and also to evaluate the outcome of surgery with Graham's patch omentoplasty in an area remote from tertiary care hospitals.

**Study Design:** Cross sectional descriptive.

**Place & Duration:** DHQ hospital, Kotli, Azad Kashmir and three other private hospitals. July 2009 to Dec 2013.

**Material & Methods:** Patients with duodenal perforation underwent laprotomy and Graham's patch omentoplasty was performed. Data was analyzed for age, sex, main presenting features, duration of symptoms, previous history of peptic ulcer disease, use of NSAIDs and steroids, operative findings, management outcome, complications, mortality and mean hospital stay.

**Results:** Out of 94 patients 68 (72.3%) were male with a male:female ratio of 2.6:1. The average age was 38.5 years, and commonest etiology was known peptic ulcer disease in smokers (53.2%). 57 (60.6%) cases presented within 24 hours of perforation. The main presenting features were sudden abdominal pain, vomiting and peritonitis. The mean size of perforation was 7.5 mm. The main complications were atelectasis (45.7%), post-operative fever (22.3%), prolonged ileus (20.2%) and wound infection (14.9%). Mortality was 4.3%. The average duration of hospital stay was 8 days and 95.7% were satisfactorily discharged home.

**Conclusion:** Graham's patch omentoplasty is a safe technique in remote areas where no tertiary hospital facilities are available.

**Key Words:** Graham's patch, Omentoplasty, Duodenal perforation.

## INTRODUCTION:

Duodenal ulcer perforation is a common surgical emergency. Perforation due to peptic ulcer is common despite antiulcer and Helicobacter eradication therapy<sup>1</sup>. The overall reported mortality rate varies between 1.3 to nearly 20%<sup>2,3</sup> and a major cause of death in elderly patients<sup>4</sup>.

While the diagnosis of a perforated ulcer is straightforward in typical cases, its clinical onset may be subtle because of comorbidities and/or concurrent therapies<sup>5</sup>. Factors such as advancing age, concomitant disease, preoperative shock, size of the perforation, delay in presentation and operation, have all been defined by various authors to be the risk factors for mortality in such a situation<sup>6</sup>.

Helicobacter pylori eradication has led to a significant decline in peptic ulcer prevalence. However, the number of patients requiring surgical intervention remains relatively unchanged<sup>6</sup>.

Graham described a procedure of plugging the perforation with free omental graft and tying by three sutures in the year 1937<sup>7</sup>. The omental graft provides the stimulus for fibrin formation and since then his approach has been considered as the golden standard<sup>8</sup>.

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Various other surgical techniques had been attempted for the treatment of perforated duodenal ulcer. These included stapled omental patch, gastroscopy aided insertion of the ligamentum teres, or omental plug. Yet, these techniques were either used only in small case series or tend to have high rates of re-operation. Laparoscopic suture closure was initially reported in 1990<sup>6</sup>. Laparoscopic surgery has become increasingly popular for elective surgery but it has gained slow transference to emergency surgery<sup>9</sup>. Some studies show that it is safe and effective surgical option for patients with peritonitis due to different abdominal emergencies in properly selected cases<sup>10</sup>. Yet it is not widely available in remote areas of our country where open approach is the most common way to deal such emergencies.

There is an established link between *Helicobacter pylori* and duodenal ulcers<sup>11</sup>. Post eradication ulcer recurrence is uncommon when combined with PPIs. Acid-reduction procedures are not required for this group of patients. As a result, simple closure of the perforation with an omental patch has become the favored management approach in many institutions. It is technically straightforward and reliable and is also the preferred approach for high-risk patients<sup>14-12</sup>

This study was conducted to evaluate the etiology and clinical presentation of duodenal perforation and also to evaluate the outcome of surgery with Graham's patch omentoplasty in our setting.

#### **MATERIAL AND METHODS:**

This study was carried out in DHQ hospital, Kotli and three other private hospitals from July 2009 to Dec 2013.

**Inclusion Criteria:** All patients with clinical diagnosis of perforated duodenal ulcer were included in this study.

#### **Exclusion Criteria:**

1. Patients with concomitant bleeding from the ulcer.
2. Evidence of gastric outlet obstructions.
3. Large perforation more than 15 mm
4. Patients with septic shock

5. Patients with clinically sealed-off perforations without signs of peritonitis or sepsis

The demographic and clinical data was recorded on a proforma designed for the study. All patients received resuscitation by intravenous fluids, nasogastric tube decompression, and parenteral analgesics before surgery. Intravenous Cefuroxime (750 mg) was given every 8 hours after the clinical diagnosis of perforated duodenal ulcer was made, and surgery was performed as soon as the operating room was ready.

All open repairs were performed according to standard techniques described in surgical textbooks<sup>13</sup>. We used an upper midline incision. After identification of the site of the perforation, a healthy piece of omentum was drawn under an arch of full-thickness polygalactin (Vicryl; Ethicon, Johnson & Johnson) sutures placed on either side of the perforation on healthy duodenum, and the sutures were tied. Thorough peritoneal toilet followed<sup>14</sup>. No drain was placed. The abdominal wound was infiltrated with 0.25% Bupivacaine at the end of the procedure. A course of proton pump inhibitor and *Helicobacter pylori* eradication therapy was given in all patients.

#### **RESULTS:**

Of 94 patients included in study, 68 (72.3%) were males with M:F ratio 2.6:1. Their ages ranged between 18 and 93 years (average 38.5 years). Most of the patients, 54 (57.4%), were below 40 years of age. 57 (60.6%) patients presented within 24 hours of perforation, 28 (29.8%) presented between 24-72 hours while nine (9.6%) presented after 72 hours. All the perforations were anterior duodenal and all had simple closure with omental patch. The average time between admission and surgery was 8 hours (range 6-11 hours). The mean size of perforation was 7.5 mm (range 5-12 mm). There were 4 mortalities. The causes of death included gram negative septicaemia and shock in two patients and severe electrolyte imbalance in one patient and respiratory failure due to COPD in one patient, who was a chronic smoker. The average duration of hospital stay was 8 days (range 6-16). Ninety patients (95.7%) were satisfactorily

discharged home and later followed-up at the surgical out-patient department. Two patients (2.1%) later presented with intra-abdominal collections and managed by percutaneous drainage. One patient with wound dehiscence required re-operation. The mean duration of postoperative gastric aspiration was 3.4 days and to resumed liquid food intake was 4.4 days. Further results are shown in Tables 1,2 and 3.

**DISCUSSION:**

Duodenal ulcer perforation is a common problem throughout the world. In review of literature, it is found common, not only in India and Pakistan but also in the far East, Africa, Europe and Saudi Arabia, despite anti ulcer and H.pylori eradication therapy.

There is a male preponderance noticed in almost all studies conducted at various parts of the

**Table-I.** Etiology of Perforation (n=94)

Etiological Factor	Number of Cases	Percentage
Known peptic ulcer disease and smoker	50	53.2%
Known peptic ulcer disease in non smokers	21	22.3%
NSAIDs use and smoker *	8	8.5%
NSAIDs use in non smoker*	5	5.4
Steroids *	10	10.6%

(\* for joint pains, respiratory problems, or dermatological problems)

**Table-2.** The Presenting Features (n=94)

Presenting Feature	Number of Cases	Percentage
Features of peritonitis	94	100%
Sudden onset of severe abdominal pain	88	93.6%
Fever	51	54.3%
Moderate to severe hypovolemia	33	35.1%
Septic state	6	6.4%

**Table-3.** Complication after Surgery (n=94)

Complication	No. of Cases	%
Atelectasis	43	45.7
Post-operative fever	21	22.3
Prolonged ileus	19	20.2
Wound infection	14	14.9
Mortality	4	4.3
Intra-abdominal collection	2	2.1
Wound dehiscence	1	1.1
Leakage of patch	0	0

world, which is probably associated to smoking or exposure to smoking of males or more stresses of life. We found 2.6:1 male to female ratio, which is in line with few studies<sup>16</sup>, but majority of researchers noticed a high female ratio of 1:4.2 to 1:14<sup>3,4,6,15,17</sup>.

The mean age in our study was 38.5 years which is consistent with some studies<sup>3,6</sup>, but as we review the literature, there is geographical variation which may be due to different dietary habits, some studies shows a low mean age of 28 years<sup>16</sup> and some shows a high age ranging from 45.9 to 54 years<sup>4,15,17</sup>.

Known peptic ulcer disease was the most common etiological factor detected in our study in 71 (75.5%) cases confirming the findings of previous studies<sup>17</sup>. Smoking was the common associated etiological reason in 58 (61.7%) cases, similar observations were made by other workers<sup>16</sup>. History of use of NSAID was present in 13 (13.9%) cases, similar history was also present in other studies ranging from 6.7% to 48.9% of cases<sup>6-15-16</sup>. The data reveals that peptic ulcer is a common disease worldwide but use of NSAIDS and smoking are also common associated factors.

The main presenting features in current study were features of peritonitis in all 100% of cases, followed by sudden onset of severe abdominal pain in 93.6%, fever in 54.3%, moderate to severe shock due to hypovolemia in 35.1%, and septic state in 6.4% of cases, these findings are in line with the observations of other workers<sup>4-17-18</sup>.

Average duration of illness at presentation was 1.1days. Different studies shows different duration ranging from 2-7 days<sup>15-16</sup>, the delay in

seeking the treatment was mainly due to lack of facilities of quick transport in resource poor semi urban/rural areas.

In this study, rate of wound infection is less than African studies but higher than in Saudi Arabia and Hong Kong. Similar results were about mortality. Probably the reason was better cleanliness and standardized setup had less wound infection and better monitoring and resuscitation facilities. Atelectasis decreased by early mobilization of patients. We had no case of leakage from omental patch while one case each in Hong Kong and Saudi Arabia underwent laparoscopic repair which is technically more demanding.

The hospital stay was less than African studies in less resourceful hospitals, similar to studies in Hong Kong and Europe but more than in Saudi Arabia. Because Saudi patients underwent laparoscopic repair and benefits of minimal access surgery were added benefit to them.

**CONCLUSION:**

Graham patch omentoplasty is a safe technique in remote areas where no tertiary hospital facilities are available.

**Table-4. Comparison of Complications after Surgery**

	Wound infection%	Chest infec/ atelectasis %	Ileus %	Mortality %	Collection %	Leak %
Current study	14.9	45.7	20.2	4.3	2.1	0
Nuhu A <sup>17</sup>	34	30	36.6	17.1	----	----
Wing TS <sup>4</sup>	12	5.8	1.6	3.3	1.6	0.8
Gupta S <sup>3</sup>	7.4	24		8.6	3.7	2.5
Hamed AW <sup>6</sup>	2.1	30		2.1	4.2	2.1

**Table-5. Comparison of Mean Hospital Stay:**

Study	Hospital Stay (Days)
Gupta S <sup>3</sup>	13.6
Chalya PL <sup>16</sup>	14
Nuhu A <sup>17</sup>	10
Druart ML <sup>18</sup>	9.3
Wing TS <sup>4</sup>	7
Current study	8
Critchley AC <sup>9</sup>	6

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