

## Original Research Article

# Clinical profile and outcome of the patients with spontaneous duodenal perforation and their association with *H. pylori* infection

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## ABSTRACT

**Background:** Peptic ulcer disease is highly prevalent in general population managed mainly by medical treatment with H2 blockers, proton pump inhibitors and antibiotics with eradication of *Helicobacter pylori*, the complications have reduced, but perforation is still frequently occurring and is always a surgical emergency.

**Methods:** It was a hospital based retrospective observational study from January 2015 to June 2017 and prospective observational study from July 2017 to June 2019. Study patients were diagnosed, managed and operated for perforated peptic ulcer at Sheri-i-Kashmir Institute of Medical Sciences, Soura, Kashmir, India. Data of 44 patients was collected using a standard proforma and their risk factors, operative procedure, post-operative progress and outcome was analysed.

**Results:** In our study of 44 cases, patients between ages of 21-30 years (31.8) were commonly affected and there was male predominance (95.5%). Smoking, use of NSAIDs and improper treatment for peptic ulcer were major risk factors. 61.4% patients presented within 24 hours of presentation. Cellan Jones repair was performed in 60.4% patients. Complications were due to co-morbid illness, age and delayed presentation for treatment.

**Conclusions:** Perforated peptic ulcer (PPU) is a frequent surgical emergency in our state, predominantly affecting young aged male, may be because of dietary habits (very spicy food), smoking, NSAIDs and other risk factors. Surgical intervention is always warranted. Simple closure with omental patch is standard procedure, followed by treatment for *H. pylori* eradication and was effective and majority of patients survived despite delayed preoperative admission.

**Keywords:** Perforated peptic ulcer, Cellan jones repair, *Helicobacter pylori*, Peptic ulcer disease

## INTRODUCTION

Peptic ulcer disease (PUD) posed a major threat to the world's population over the past two centuries with a high morbidity and mortality. Etiopathogenesis of peptic acid disease from acid-driven disease to an infectious disease (*H. pylori*) has opened up this topic for various studies to find the best possible options for management.

Overall prevalence of *H. pylori* infection and peptic ulcer has decreased by the use of PPI'S and therefore that of

duodenal perforation. But prevalence in our setup (third world countries) is still more than rest of the world due to inadequate treatment of peptic ulcer and especially that caused by *H. pylori* infection. In India prevalence among age group 0-4, 10-19 and adults is 22%, 87%, 88% respectively and in south India is 80%.<sup>1</sup>

Perforation is often the first clinical presentation of PUD.<sup>2</sup> The perforation site usually involves the anterior wall of the duodenum (60%).<sup>3</sup> Perforated peptic ulcer (PPU) used to be a disorder mainly of younger patients (predominantly

males), but recently the age of PPU patients is increasing (predominantly females).<sup>4,5</sup> The need for surgery for PPU has remained stable or even increased and the mortality of peptic ulcer surgery has not decreased and may be due to an increase in use of aspirin and/or NSAIDs.<sup>6</sup>

Until the discovery of the role of *H. pylori* in gastric and peptic ulcers by Barry J. Marshall and Robin Warren in 1982, stress and life style factors were believed to be the most important factors contributing to PUD and PPU.<sup>7</sup> Traditionally, peptic ulcer is diagnosed endoscopically, but this is an expensive tool and not well tolerated by patients.<sup>8</sup> The preferred method to diagnose *H. pylori* is by taking pre-operative biopsies.<sup>9</sup>

The pathogenesis of peptic ulcer disease may be considered as a combination scenario involving an imbalance between defensive factors (mucus-bicarbonate layer, prostaglandins, cellular regeneration, and mucosal blood flow) and aggravating factors (hydrochloric acid, pepsin, ethanol, bile salts, drugs).

Major risk factors for peptic ulcer disease are: smoking, NSAIDs use, alcohol, spicy foods and their combination. The pathology can be divided in three broad categories, (1) *H. pylori* positive (2) *H. pylori* negative and non-NSAID associated (3) NSAID associated.

Three clinical phases in the process of PPU can be distinguished:<sup>10</sup>

Phase 1: Chemical peritonitis/contamination.

Phase 2: Intermediate stage. After 6–12 h many patients obtain some relief of pain. This is probably due to the dilution of the irritating gastroduodenal contents by ensuing peritoneal exudates.

Phase 3: Intra-abdominal infection.

Laboratory studies are not useful in the acute setting as they tend to be nonspecific.

Free air under the diaphragm found on an upright chest X-ray is indicative of hollow organ perforation and mandates further work-up and/or exploration. CT scans has greatly improved ability to detect perforation.

### ***Current management perforated peptic ulcer***

#### ***Non-operative management***

Conservative treatment is known as the Herman Taylor method and consists of nasogastric aspiration, antibiotics, intravenous fluids and nowadays *H. pylori* triple therapy.<sup>11,12</sup> The fundamental idea for conservative treatment came from Crisp who in 1843 noted that perforations of the stomach were filled up by adhesions to the surrounding viscera which prevented leakage from the stomach into the peritoneum.<sup>12</sup> It has been estimated that

about 40–80% of the perforations will seal spontaneously and overall morbidity and mortality are comparable.<sup>3,11-13</sup> However, delaying the time point of operation beyond 12 h after the onset of clinical symptoms will worsen the outcome in PPU.<sup>3,14</sup> Also in patients >70 years of age conservative treatment is unsuccessful with a failure rate as high as 67%.<sup>13,14</sup> Shock at admission and conservative treatment were associated with a high mortality rate (64%).<sup>11,14</sup> In conclusion, one can say that non-operative treatment is limited to patients <70 years of age who are not eligible for surgical repair due to associated morbidity, with documented contrast studies showing that the perforation has sealed completely.

#### ***Operative management***

##### ***Simple suture***

##### ***Open repair technique***

Simple closure of the perforation can be done in different ways: simple closure of the perforation by interrupted sutures without omentoplasty or (free) omental patch, simple closure of the perforation with a pedicled omentum sutured on top of the repair, representing omentoplasty, a pedicled omental plug drawn into the perforation after which the sutures are tied over it, and finally the free omental patch after Graham.

##### ***Omentoplasty or omental patch***

Cellan-Jones published an article in 1929 entitled ‘a rapid method of treatment in perforated duodenal ulcers. It was not until 1937 that Graham published his results with a free omental graft.<sup>15,16</sup> The omental graft provides the stimulus for fibrin formation. His approach has been the golden standard since.<sup>17</sup>

##### ***Irrigation of the peritoneal cavity***

Generally, it is reflected on to be one of the most important parts of the surgery and irrigation with 6–10 liters and even up to 30 liters of warm saline is recommended.<sup>4</sup> However, the rationale for the routine use of intra operative peritoneal lavage seems to be more a historically based custom lacking any evidence-based support.<sup>18</sup>

##### ***Drainage or not***

In a questionnaire 80% of the responders answered that they would not leave a drain.<sup>19</sup> A drain will not reduce the incidence of intra-abdominal fluid collections or abscesses.<sup>19</sup> On the other hand, the drain site can become infected (10%) and can cause intestinal obstruction.<sup>19,20</sup>

##### ***Definitive surgery***

The number of elective procedures performed for PUD has declined by more than 70% since the 1980s.<sup>3,9</sup> Patients in whom definitive ulcer surgery should be considered are

those with PPU who are found to be *H. pylori*-negative, or those with recurrent ulcers despite triple therapy.<sup>3,6,12,21,22</sup> In these patients, a parietal cell vagotomy is recommended if necessary combined with anterior linear gastrectomy.<sup>23</sup>

### **Aims and objectives**

Clinical profile of patients presenting with spontaneous duodenal perforation. Outcome of patients undergoing omentoplasty. *H. pylori* association in patients with duodenal perforation.

## **METHODS**

The study area of the thesis was Department of Surgery and Minimal Invasive Surgery; and Department of Gastroenterology, SKIMS Soura. It was a hospital based retrospective observational study from January 2015 to June 2017 and prospective observational study from July 2017 to June 2019. All patients with the diagnosis of perforated spontaneous duodenal ulcer disease following emergency laparotomy due to acute abdomen were taken as cases. All patients with intra operative diagnoses of perforation in the duodenal region were included into the study as cases and clinical outcome was studied.

In prospective group of patients, in each case, two antral biopsy specimens (one from the lesser and one from the greater curvature) were taken after six weeks which has virtually 100% sensitivity for detecting *H. Pylori* infection. Specimens from the body were obtained for evaluation of the distribution and severity of gastritis, but they do not increase the diagnostic yield unless extensive intestinal metaplasia is present in the antrum.<sup>24</sup>

For accurate diagnosis and assessment, biopsies were taken in prospective group from following four sites: the lesser curvature of the mid antrum and middle body, and the greater curvatures of the mid antrum and middle body of the stomach.<sup>25</sup>

### **Research instruments**

A structured Questionnaire for face-to-face interview technique with the patient was used. In both retrospective and prospective group, the questionnaire was used to collect information. The biopsy for *helicobacter pylori* was obtained by endoscopy after six weeks of perforation in patients of prospective group.

### **Inclusion criteria**

All patients who presented to SKIMS with spontaneous duodenal perforation were included in the study.

### **Exclusion criteria**

All patients with traumatic and iatrogenic perforations were excluded from the study.

## **Statistical method**

Analysis was done in statistical package for social science (SPSS) software. All continuous variables were shown in form of descriptive statistics (Mean and SD) and categorical variables were shown in form of tables and diagrams.

## **RESULTS**

### **Age incidence**

In the present series of 44 cases of DU perforation, the age of the patients varies from 18-75 years. The peak incidence is between 21 and 30 years.

**Table 1: Age distribution.**

Age(years)	Frequency	Percent
10-20	3	6.8
21-30	14	31.8
31-40	9	20.5
41-50	9	20.5
51-60	8	18.1
61-70	0	0
71-80	1	2.2
<b>Total</b>	44	100
Odds Ratio 1.133 (0.953-1.348)		

The present series shows incidence of DU perforation is uncommon in adolescence as shown by the incidence of only 02 cases which are 18 years old.

### **Gender distribution**

In this present series of 44 cases, 42 are males and 02 are females. The majority of authors have reported that incidence is high in males as compared to females.

### **Residence**

In the present series of 44 cases, 29 (65.9%) belong to rural area and 15 (34.1%) belong to urban area.

### **Occupational incidence**

The maximum number of cases in the present series occurred in working class. In the present study 22 (50.0%) are working class, 06 (13.6%) are farmers, 10 (22.7%) are unskilled laborers, 05 (11.45%) are unemployed, 01 (2.3%) is house wife and 05 (11.4%) were unemployed.

### **Seasonal distribution**

The analysis of 44 cases of perforation in the present series in relation to various months showed that maximum incidence of perforation was during April- June 18 (40.9%) followed by July – September 11 (25.0%),

followed by October- December 9 (20.5%). It was lowest during January-March 6 (13.6%).

### Presenting complaint

**Table 2: Presenting complaints.**

Symptom	Frequency	Percentage
<b>Pain</b>	41	93.2
<b>Vomiting</b>	15	34.1
<b>Abdominal distention</b>	10	22.7
<b>Constipation</b>	03	6.8
<b>Fever</b>	05	11.4
<b>Shock</b>	02	4.5
<b>Nausea</b>	04	9.1
<b>Pain RIF</b>	02	4.5
<b>Abdominal signs</b>	43	97.7

### Habits

In present series of 44 cases, 31 (70.5%) were smokers and 02 (4.5%) were alcoholic and 02 (4.5%) were both alcoholic and smokers and 28 (63.5%) are currently smoking.

### History of drug intake

In the present series 11(25.0%) has history of NSAID intake and 02 (4.5%) patients were currently taking NSAIDS.

### Food habits

25 cases (56.8%) were taking spicy foods.

### Psychological stress

17 cases (38.6 %) have history suggestive of psychological stress.

### Previous history of dyspepsia /PUD

In the present series, 14 patients (31.8) have history suggestive of peptic ulcer and 06(13.6%) were diagnosed cases amounting to total of 20 cases (45.5%) cases of PUD.

### Pre-admission delay

In this study 27 cases (61.4) presented with in ist 24 hours of presentation of symptoms.

### Examination of abdomen

The findings noted in the present series of 44 cases and results obtained after local examination of the abdomen have been discussed as follows:

### Tenderness, guarding and rigidity

**Table 3: Pre-admission delay.**

Preadmission delay	Frequency	Percent
<b>&lt; 24 hours</b>	27	61.4
<b>24-48 hours</b>	08	18.2
<b>48-72 hours</b>	06	13.6
<b>&gt;72 hours</b>	03	6.8
<b>Total</b>	44	100.0

Among 44 cases, in 42(95.5%) cases tenderness was elicited. Generalized tenderness all over the abdomen is due to widespread peritonitis.

Guarding and rigidity was present in 43(97.7%) cases.

### Plain X-ray abdomen

Gas under diaphragm was present in 41(93.2%) of patients.

### Co-morbidities

**Table 4: Associated co-morbidities.**

Disease	No. of patients	Percentage
<b>HTN</b>	04	9.1
<b>T2 DM</b>	01	2.27
<b>B asthma</b>	01	2.27
<b>CKD</b>	01	2.27

### Treatment

In the present series out of 44 cases, 43 were subjected to surgical management and one patient was treated on conservative basis because he had sealed duodenal perforation.

### Pre-operative treatment

In all cases, immediately after the admission a thorough clinical workup was done, intravenous fluids started, antibiotics given and nasogastric aspiration started. Preparation of part done and blood drawn for blood grouping and cross matching.

### Conservative line of treatment

In the present series, only one patient was treated along the conservative line of management of 'Herman Taylor' because of sealed duodenal ulcer perforation

### Operative treatment

In the present series of 44 cases, 43 cases were subjected to surgical line of treatment.

### Procedure

Among 44 cases, 43 patients were operated and one patient was managed conservatively. In 26 patients Cellan Jones procedure was done. In 15 patients Graham's patch was put in. In 01 patient exploratory laparotomy with peritoneal lavage and mopping was done and abdominal drains were put in.

**Table 5: Type of procedure.**

Procedure	Frequency	Percent
<b>Grahams patch</b>	16	37.2
<b>Cellan Jones repair</b>	26	60.4
<b>Simple abdominal drainage</b>	01	2.3
<b>Total</b>	43	100.0

### Site involved

In all cases (100%) anterior surface of duodenum was involved.

### Part involved

In 41 patients first part of duodenum was involved and in 03 patients second part was involved.

### Definitive procedure

Only one patient underwent definitive procedure. In him selective truncal vagotomy was done. This was retrospective case. In prospective cases none underwent definitive procedure. DU perforation cases came in emergency and were sick and had peritonitis. This was reasoning that definitive procedure was not done in emergency.

### Post-operative treatment

The post-operative management consisted of: nil per oral, nasogastric aspiration, intravenous fluids, continuous monitoring of pulse and BP, antibiotics, analgesics and injection Pantoprazole intravenous

By about 2<sup>nd</sup> or 3<sup>rd</sup> day, the aspiration quantity decreased and bowel sounds started returning to normal. The nasogastric tube was removed and oral fluids allowed. Progressively oral fluids were increased in quantity, IV fluids stopped. About 5<sup>th</sup> or 6<sup>th</sup> day patient was allowed soft diet. On 8<sup>th</sup> day, patient was allowed normal diet.

The post-operative period was uneventful in most cases. In all cases, drainage tube was removed on 5<sup>th</sup> post-operative day.

Sutures were usually removed on 8<sup>th</sup> or 9<sup>th</sup> day and patient was discharged on 10<sup>th</sup> or 11<sup>th</sup> day depending on the condition of the patient, except in one patient with wound

dehiscence, who was treated with regular dressings and antibiotics.

### Post-operative complications

In the present series, 43 patients were operated. Two patients developed wound dehiscence that required secondary suturing. Three patients were managed in SICU for MODS and among those two patients died. One patient developed drain site infection and same patient also developed pleural effusion.

Four patients in total developed pleural effusion. Five patients developed intra-abdominal collection. Among these patients three were managed conservatively and in another two patients pig tail was put and abdominal collection was drained. Two patients developed hypertrophic scar and one developed ARF. Two patients in total developed SSI. One developed enterocutaneous fistula.

**Table 6: Pre-operative complications.**

Post operative complications	Frequency	Percent
<b>MODS</b>	03	6.8
<b>ARF</b>	01	2.27
<b>Cardiopulmonary arrest</b>	02	4.5
<b>Abdominal collection</b>	05	11.36
<b>SSI</b>	02	4.5
<b>Reactionary pleural effusion</b>	04	9.09
<b>Wound dehiscence requiring secondary suturing</b>	02	4.5
<b>Hypertrophic scar</b>	02	4.5
<b>Fistula</b>	01	2.27

### Outcome of omentoplasty

Among 44 cases, 41 patients underwent omentoplasty. Three patients had sealed duodenal perforation. One patient (2.4) developed enterocutaneous fistula. In 40 (97.5 %) patients omentoplasty was uneventful.

### H. Pylori association

Among 44 cases, 42 were operated in which 31 are prospective cases and 12 are retrospective cases. Three patients had sealed duodenal perforation and among those 01 was managed conservatively and in 02 patient's exploratory laparotomy with peritoneal lavage and mopping was done and abdominal drains were put in.

02 patients died in post-operative period. 03 patients lost to follow up. 01 patient developed enterocutaneous fistula.

Among 26 patients in whom endoscopy was done, 01 showed vague granuloma and lymphoid infiltrate in



biopsy. In 23 patient's biopsy was *H pylori* induced chronic gastritis. In 01 patient sample was autolysed. In 01 patient biopsy came as chronic gastritis.

**Table 7: Prospective patient profile.**

Prospective patient profile	Frequency	Percent
<b>H pylori association</b>	23	71.8
<b>Lost to follow up</b>	03	9.37
<b>Autolysed sample</b>	01	3.12
<b>Chronic gastritis</b>	01	3.12
<b>Vague granuloma and lymphoid infiltrate</b>	01	3.12
<b>Enterocutaneous fistula</b>	01	3.12
<b>Died in post operative period</b>	02	6.25
<b>Total</b>	32	100.0

### Follow up

Out of the 44 cases, prospective cases are 32 and retrospective cases 12 cases. Retrospective cases are on follow up in general surgery department and medical gastroenterology. Among prospective cases two died in post-operative period and 03 patients lost to follow up despite of proper advice and postal communication. In total 39 patients are on follow up. Patients in whom endoscopy was done *H pylori* kit was started after endoscopy procedure. Endoscopy procedure was done 06 weeks after surgery. Three patients who lost to follow up were telephonically advised to take *H pylori* kit. In patients in whom endoscopy was not done *H pylori* kit was started in follow up. One patient had persistent pain epigastrium after starting of *H pylori* kit and in whom stool for *H pylori* antigen was done which came out as negative report.

### DISCUSSION

The discussion is based on analysis of data pertaining to 44 cases. This study was done in the department of General and Minimal Invasive Surgery, SKIMS Soura in collaboration with department of Medical Gastroenterology, SKIMS Soura and was first of its kind in this quaternary care hospital.

A total of 44 patients (12 retrospective and 32 prospective) with spontaneous duodenal perforation were enrolled. Clinical profile and outcome of omentoplasty was seen in each patient and association of *H pylori* in prospective group.

In the present series of 44 cases of DU perforation, the age of the patients varies from 18-75 years. The peak incidence is between 21 and 30 years. The present series shows incidence of DU perforation is uncommon in adolescence as shown by the incidence of only 02 cases which were 18 years old. Studies done by Zangana et al, Singh et al, Mathur et al, Shah et al, Mohapatra et al show peak age of

30-39, 41-50, 31-50, 41-50, 31-39, respectively.<sup>26-30</sup> In our study peak age is 21-30 years and this early peak is probably because traditionally we take high spicy foods, high salt intake (because we drink salt tea more) and smoking at early age.

Out of 44 patients 95.5% were males and 4.5% females which is in conformity to the studies done by Zangana et al, Garota et al, Singh et al, Mathur et al, Kumawat et al, Joshi et al, Parihar et al, Shah et al, Panchal et al, Mohapatra et al which show male preponderance of 89.5%, 96.3%, 83%, 80%, 92.3%, respectively.<sup>26-30</sup>

The present series is not a large series to give a definite opinion regarding the study of gender distribution but it definitely brings to light the preponderance of male incidence over the female sex. The high incidence of male can be explained on the basis of greater hardship, strains, anxiety and indulgence in smoking, alcoholism, and intake of NSAIDs. They have to endure in earning the livelihood for their family.

In the present series of 44 cases, 29 (65.9%) belong to rural area and 15 (34.1%) belong to urban area. The reason can be that rural people are more involved in smoking, alcoholism and less health education and low socio-economic status.

The maximum number of cases in the present series occurred in working class. In the present study 22 are working class, 06 are farmers, 10 are unskilled laborers, 05 are unemployed and 01 is house wife. Study done by Dr. Laishram Oken Singh et al also shows maximum in labourers (34.6%).<sup>26</sup> In our study perforation is more common in working class. The reason can be hardship, stress and anxiety.

The analysis of 44 cases of perforation in the present series in relation to various months showed that maximum incidence of perforation was during April- June 40.9% in contrast to Study done by Singh et al also shows maximum in October to January (45.5%), followed by July – September 25.0%.<sup>26</sup> It was lowest during Jan-March 13.6%. In winter due to cold people take more spicy foods than other times and smoke more which act as trigger factors for perforation.

In the present series 93.2% patients had pain epigastrium, 34.1% had with vomiting, 22.7% had abdominal distention, 06.8% had constipation, 11.4% had fever, 4.5% had shock, 9.1% had nausea, 4.5% had pain RIF, 97.7% had abdominal guarding/ tenderness/ rigidity/ rebound tenderness or combination of these abdominal signs. Studies done by Singh et al, Mathur et al, Shah et al also show that maximum presented with pain abdomen- 100%, 97.3%, 100% respectively.<sup>26-28</sup>

In present series of 44 cases, 31 (70.5%) were smokers and 02 (4.5%) were alcoholic and 02 (4.5%) were both alcoholic and smokers. Studies done by Zangana et al,

Garota et al, Singh et al, Shah et al show that smoking history is present in 69.4%, 20%, 40%, respectively.<sup>26-29</sup> and alcohol history in 27.4%, 27.3%, 6%, respectively and study done by Singh et al, Shah et al show that both smoking + alcohol history in 34.5 and 14%, respectively.<sup>26-29</sup> These study results are in conformity as results drawn by our study.

In the present series 11 (25.0%) had history of NSAID intake and 4.5% patients were presently taking NSAIDS. Our results are almost similar to results of studies done by Zangana et al, Garota et al, Singh et al which show NSAIDS history in 32.2%, 20.9%, respectively.<sup>26,27</sup>

17 cases (38.6%) had history suggestive of psychological stress. Study done by Zangana et al, Garota et al show history of psychological stress in 75.8% cases. In our study psychological stress is less which is probably due to sound economy of our maximum cases which belong to working class.(50%).<sup>26</sup>

25 cases (56.8%) were taking spicy foods. In study done by Singh, et al 76.4% were taking spicy foods. Probably other factors are more predominant than high spicy foods which are NSAIDS, smoking or combination of these all these factors.<sup>27</sup>

In the present series, 14 patients (31.8%) had history suggestive of peptic ulcer and 06 (13.6%) were diagnosed cases amounting to total of 20 cases (45.5%) cases of PUD. None of the diagnosed cases had either evidence of *H. pylori* or treated with anti *H. pylori* therapy. Studies done by Singh et al, Mathur et al, Mohapatra et al show history of PUD in 61.8%, 49.32%, 53.8%, respectively.<sup>26,28,30</sup> Study done Mathur et al show diagnosed cases of 21%.<sup>28</sup> Reason for this is apparently not known. It needs further study in future.

In this study 27 cases (61.4%) presented with in first 24 hours of presentation of symptoms in contrast to study done by Mathur et al which show maximum reach in 24-48 hours (50.13%), 18.2% within 24-48 hours, 13.6% within 48-72 hours and 6.8% after 72 hours.<sup>28</sup> Early presentation is related to less post op complications. Reason for this early arrival to hospital is because of less distance to travel to specialty care in our valley.

In 23 (52.3%) of the cases pulse rate was between 100-120/minute. In 01 (2.3%) it was more than 120/ min. In 20 (45.5%) of cases it was less than 100/minute which is in conformity to the study done by Singh et al in which 48.2% had pulse greater than 100/min.<sup>27</sup>

BP was within normal limits in 40 cases (91.0%). 04 cases (9.0%) had BP of less than 90/60 mm Hg which was brought up by IV fluids and which is in conformity to the study done by Singh et al in which only 21.8% had systolic BP less than 90 mmHg.<sup>27</sup>

Among 44 cases, in 42 (95.5%) cases tenderness was elicited. Study done by Shah et al, Panchal et al showed that 100% patients presented with tenderness.<sup>29</sup> Generalized tenderness all over the abdomen is due to widespread peritonitis.

Guarding and rigidity was present to a variable extent over the upper abdomen and mainly generalized guarding and rigidity was present in majority of the cases due to protective spasms of the abdominal muscles in response to peritoneal irritation, from the leaking gastroduodenal contents. Guarding and rigidity was present in 43 (97.7%) cases.

In all cases X ray abdomen was taken in erect position. Gas under diaphragm was noticed in 41 patients (93.18%) which is suggestive of perforation.

Singh et al, Shah et al, Mohapatra et al showed that gas under diaphragm is present in 97.3%, 98% and 96.2%, respectively.<sup>27,29,30</sup>

The amount of gas under diaphragm gives a clue to the size of perforation. In cases of massive collection of gas under the diaphragm there was large perforation, whereas a small amount of gas indicated small size of perforation.

In our study 37 (84.0%) of patients had no systemic problem. Out of the remaining 04 (9.0%) were hypertensive, 01 (2.27%) had T2DM, 01 has asthma and 01 patient was case of CKD. In study done by Singh et al 19% patients were diabetic which is more than our study.<sup>27</sup> Diabetes is one of the reasons of postoperative complications.

In the present series out of 44 cases, 43 were subjected to surgical management in which 31 are prospective cases and 12 are retrospective cases.

In prospective group of patients, in 26 patients Cellan Jones procedure was done and in 16 patients Grahams patch was put in. Two patients had sealed duodenal perforation and among those 01 patients was treated on conservative basis of 'Herman Taylor' regimen because he had sealed duodenal perforation and in 01 patient exploratory laparotomy with peritoneal lavage and mopping was done and abdominal drains were put in. In studies done by Mathur et al, Shah et al omentopexy was done in 93.25 and 80% patients which is almost same as of our study.<sup>28,29</sup>

In all cases anterior surface of duodenum was involved. In 41 (93.1%) patients first part of duodenum was involved and in 03 patients second part was involved. In study done by Singh et al 100% patients had perforation in 1st part. Reason for this is evident as gastric metaplasia is required for *H. pylori* colonization which will be most in 1st part of duodenum.<sup>27</sup> All patients had solitary perforation of duodenum.

In the present series, 43 patients were operated. Two patients developed wound dehiscence that required secondary suturing. Three patients were managed in SICU for MODS and among those two died. One patient developed drain site infection and same patient also developed pleural effusion. Four patients in total developed pleural effusion. Five patients developed intra-abdominal collection. Among these patients three were managed conservatively and in another two patients pig tail was put and abdominal collection was drained. Two patients developed hypertrophic scar and one developed ARF. Two patients in total developed SSI. One developed enterocutaneous fistula. Studies done by Singh et al, Mathur et al, Shah et al show maximum postoperative complication of chest infection (7.3%), SSI (32.7%) and SSI/ pulmonary infection (26%), respectively.<sup>26-28</sup>

Among 44 cases, 41 patients underwent omentoplasty. In studies done by Mathur et al, Shah et al, omentopexy was done in 93.25 and 80% patients which is almost same as of our study.<sup>27,28</sup>

Three patients had sealed duodenal perforation. One patient developed enterocutaneous fistula. In 41 patients omentoplasty was uneventful.

In 26 patients endoscopy was done. In our study antibiotics were used in perioperative period and PPIs were continued. 01 showed vague granuloma and lymphoid infiltrate in biopsy. In 23 (88.4%) patients biopsy was *H pylori* induced chronic gastritis. In 01 patient sample was autolysed. In 01 patient biopsy came as chronic gastritis.

Out of the 44 cases, prospective cases are 32 and retrospective cases 12 cases. Retrospective cases are on follow up in general surgery department and medical gastroenterology. Among prospective cases two died in post operative period and 03 patients lost to follow up despite of proper advice and postal communication. In total 39 patients are on follow up. Patients in whom endoscopy was done *H pylori* kit was started after endoscopy procedure. Endoscopy procedure was done 06 weeks after surgery. Three patients who lost to follow up were telephonically advised to take *H pylori* kit. In patients in whom endoscopy was not done *H pylori* kit was started in follow up. One patient had persistent pain epigastrium after starting of *H pylori* kit and in whom stool for *H pylori* antigen was done which came out as negative report.

## CONCLUSION

This was a hospital based observational study conducted in the department of General and Minimal Invasive Surgery at Sher-i-Kashmir Institute of Medical Sciences Srinagar with a view to evaluate patients of spontaneous duodenal perforation in terms of clinical profile, outcome of omentoplasty and association of *H pylori* infection. From this study we concluded as under:

DU perforation is one of the common acute abdominal emergencies. The peak incidence was between 21-30 (31.8%) years and this shows that duodenal ulcer perforation has a predilection for young adults. No perforation was found in children and the oldest patient in this series was 75 years old man and the youngest was 18 years old. In the present series of 44 cases 02 were female. Duodenal ulcer perforation was common in working class group (50.0%). There was no family history of peptic ulcer disease in present series. The maximum incidence of perforation occurred in the months of April to June (40.9%). 31.8 % of patients had previous history suggestive of chronic duodenal ulcer. 13.6 % of cases were diagnosed cases of peptic ulcer disease. Most of the patients (61.4%) presented within 24 hours with sudden onset acute pain abdomen in the epigastrium. No patient developed perforation after coming to the hospital for treatment for chronic duodenal ulcer. The general condition of the majority of the patients was satisfactory at the time of admission. Most of the patients had generalized guarding and rigidity and diffuse tenderness. The operative line of treatment has an upper hand over conservative line of treatment as patients present mostly with peritonitis. 43 cases were subjected to surgery and one was treated conservatively. Simple closure of perforation was done in 97.7% patients. In the present series 01 patient developed enterocutaneous fistula and wound dehiscence, 01 patient developed drain site infection, 05 patients developed intra abdominal collection, 04 patients developed pleural effusion. 02 patients developed hypertrophic scar. 02 patients in total developed wound dehiscence that required secondary suturing. Two patients developed SSI. 03 patients were managed in SICU who developed MODS and among those 02 patients died. 01 patient developed ARF. In 26 patients endoscopy was done and 23 (88.4%) patients came positive for *H pylori* association. Among other 03 patients, one had chronic gastritis, one with autolysed sample, and one had vague granuloma with lymphoid infiltrate. Omentoplasty was successful in total of 40 patients (97%).

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