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A CASE REPORT OF SURGICAL MANAGEMENT OF PEPTIC ULCER DISEASE.

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ABSTRACT

Peptic ulcer disease is a healthcare issue globally which requires multiple and interdisciplinary approach to reduce prevalence and morbidity. H. Pylori and NSAID are usually associated to peptic ulcers. Several approaches are often employed including herbal remedies in peptic ulcer diseases but surgical intervention cannot be ruled out in the disease burden management and control. This is a case report on a middle-aged man with a perforated viscus and avid background of smoking and alcohol abuse which were contributory to his acute presentation of abdominal pain secondary to perforated peptic ulcer disease in a Hospital in Jamaica. Though, general approach was employed, the surgical intervention during emergency stabilized the patient leading to recovery. Therefore the Surgeons and healthcare practitioners should employ the surgical approach and possibly advance care through surgical techniques and innovation to provide optimal outcomes in managing peptic ulcer diseases from tertiary to primary healthcare facilities.

Keywords: Peptic ulcer, PUD, Surgery, Management, Surgical medicine

INTRODUCTION

Peptic ulcer disease (PUD) is an erosion or crater in a segment of the stomach or first part of the small intestine (duodenum) resulting from imbalances between muco-protective elements and gastric acid secretion with the outcome yielding a mucosal environment that is vulnerable to hypersecretion of gastric acid with resultant surface and physiologic changes within the stomach and or duodenum [1-9]. Patients with peptic ulcer disease typically have a strong predisposing risk factor that lead to their progressive and acute manifestation of the disease such as smoking, alcohol abuse and infection with *H. pylori*. These risk factors especially with *H. pylori*, have a strong correlation with ulcer formation, other risk factors include use of NSAIDs and stress (psychosocial and physiologic stress) [10-13]. Also, ulcer may be caused or increased by frequent use of drugs like pain killers and non-steroidal anti-inflammatory medicines including: aspirin, ibuprofen, naproxen and others [6]. Globally, the use of herbal and alternative remedies for peptic ulcer management has been studied and advocated especially in Africa [13-17]. *H. Pylori* and NSAID are always mentioned in the cases peptic ulcers, and required multiple efforts to control PUD may be lacking in the primary healthcare settings where most of them are presented. The peptic ulcer and associations with *H. pylori* including the management has

been of high interest [12, 13], this case study presents the general and surgical management of Peptic Ulcer Disease in a Subject.

CASE SUBJECT

Our patient is a 49-year-old male with a previous history of queried, documented strange behaviour, with a social history of chronic smoking and alcohol abuse which were antecedent activities prior to his manifestation of his acute abdomen, prompting the emergent diagnosis of queried perforated viscus due to peptic ulcer which warranted a surgical emergency repair.

On presenting to the emergency department for his admission, he had peritoneal signs of guarding, tenderness and rebound evident on physical examination. Prior to presentation at the emergency department, he had a 1-day history of progressive abdominal pain that was graded at 8/10 on the point scale of pain. In the non-acute setting, other causes of acute abdomen and dyspepsia have to be ruled out prior to the investigative diagnosis of Peptic ulcer disease. This is diagnosed based on history detailing symptoms associated with dyspepsia, non-steroidal anti-inflammatory drugs, smoking and alcohol use and their relationship with meals and appetite complemented with the use of upper gastrointestinal visual studies (endoscopy) as is confirmed by the care team's diagnostic workup and clinical evaluation. The evidence based clinical

practices used to diagnose and manage PUD are presented in this case report in relation to the patient.

CASE PRESENTATION

Presenting Complaint: The patient reports progressively worsening abdominal pain of 1-day duration. History of Presenting Complaint: A 49-year-old male of a Jamaican address, presents with a past psychiatric history of strange behaviour without any formal diagnosis and chronic illnesses, he was relatively well in the past week when he began experiencing pain to the lower abdomen. He could not rate the pain but states that it was sudden in onset without aggravating or relieving factors. The patient noted worsening of the pain the previous day which became generalized with a 10/10 severity with no aggravating or relieving factors but was associated with pain and multiple episodes of vomitus with visible food contents. Occasional mild dysphagia was noted. There was no vomiting on the morning of presentation. No associated fever, diarrhea or constipation, no abdominal distention or loss of appetite. Last bowel movement was recorded in the 2 days back. Patient presented to May Pen Hospital for further management of his worsening complaint and consented to medical management and documentation.

Past Medical History: Gunshot wound to the hand in the past 18 years.

Past Surgical History: 'Surgery to the hand' secondary to gunshot wound

Drug History/Allergies: N/A

Family History: Not significant for diabetes, hypertension, asthma, sickle cell or cancers **Social History:** The subject Smokes 1-3 packs of cigarette per day;

Takes 2 shots of 85% alcohol/rum per day and the Diet is rich fast food.

Review of Systems

CNS: Alert and oriented to time, place and person

Cardiovascular: Audible heart sounds with S1 and S2 noted no palpitations, no associated chest pain, no presyncope or syncope

Respiratory: Audible vesicular breath sounds. No crepitations on auscultation and no wheezes. No chronic cough, dyspnea, or orthopnea

Abdomen: Flat and rigid abdomen with rebound, involuntary guarding and generalized tenderness. No visible masses or palpable organomegaly. Audible bowel sounds were noted.

Genitourinary: Normal smell and colour of urine. No dysuria, urinary frequency, urgency or nocturia

Musculoskeletal: Power and reflexes are intact with no reduction or focal deficits.

Physical Exam On examination, a middle-aged male is seen in painful distress. Mucous membranes are moist and pink, anicteric, acyanotic and afebrile.

Vitals on Admission: Blood pressure - 105/74 mmHg, Heart rate - 151 bpm, Respirations - 21 breaths; Temperature - 98%, SpO2 - 98% on room air, NG tube in-situ with minimal bilious drainage in tube. Urinary catheter was in-situ with visible, amber-coloured urine in 100 ml urine bag.

Differential Diagnosis: Peptic Ulcer disease, Gastritis, Pancreatitis, Gastric carcinoma, and Biliary colic

Investigations

The following investigations were carried out in the emergency department in an attempt to address and stabilize the patient's acute presentation. It was initially difficult to attain cooperation from

the patients. Endoscopy could not be attained as it is contraindicated in patients with acute abdomen due to obstruction and perforation as is seen in our patient with pneumoperitoneum.

Medical Laboratory Diagnosis

The various medical laboratory diagnosis carried out on the case subject is presented in table 1 while using the arrows to indicate increase \uparrow , decrease \downarrow or normal \leftrightarrow diagnostic values.

Table 1. Medical Laboratory Tests carried out with Results

Complete Blood Count	Clinical Chemistry Test
Hemoglobin- 19.1 g/dl (11 -18)	Sodium- 134mmol/L (135 - 145) \downarrow
White blood cells 14.15×10^9 (4–10) \uparrow	Potassium- 4.3mmol (3.5 - 5.5) \leftrightarrow
-89% neutrophils	Chloride- 89mmol (98 – 107) \downarrow
Platelets- 254×10^9 (150-400) \leftrightarrow	Creatinine- 65mmol/l (44 – 132)
Liver Function Tests	Blood Urea Nitrogen 9.4mmol (3.5 – 7.1)
Albumin- 48mmol/L (35 – 55)	Amylase-214U/L (10-130) \uparrow
GGT- 32U/L (8 -63)	Lactate-357U/L (109-193) \uparrow
ALP- 91U/L (35 – 92)	Magnesium- 1.22mmol/L (10 - 130) \downarrow
ALT- 13U/L (6 – 37)	
AST- 21U/L (0 - 30)	
NB: LFT- \leftrightarrow	

CHEST X-RAY:

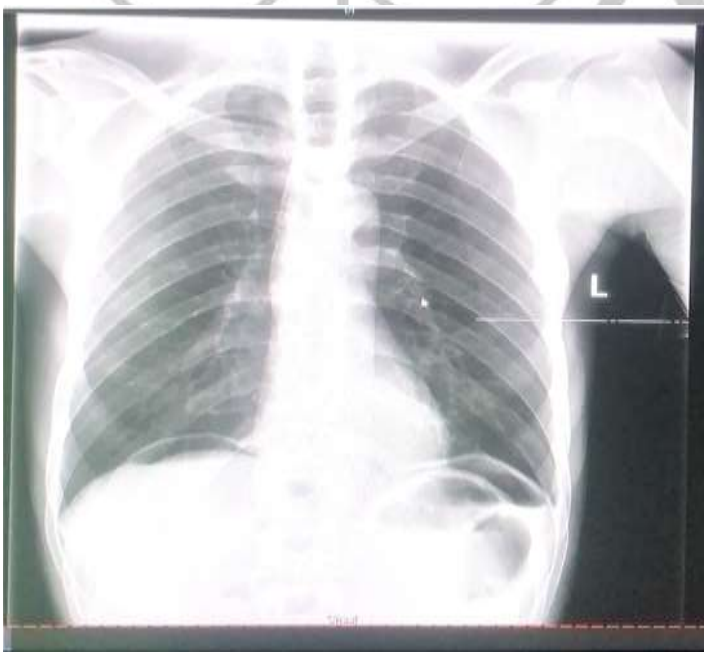


Figure 1. X-Ray Film of the Subject

Chest X-ray of the patient shown in figure 1. It was taken at the emergency department with the findings showing evidence of bilateral pneumoperitoneum. Recall that from the vital signs and respiratory exam; the patient presented with mild tachypnea with a respiratory rate of 21 breaths per minute. On examination of the X-ray, no tracheal deviations, mediastinal widening and areas of increased radiolucency were noted (ruling out a spontaneous pneumothorax due to esophageal perforation since the patient's history hinted an experience of occasional dysphagia).

At this point, a diagnosis of perforated viscus was made with pending diagnosis of peptic ulcer disease which requires endoscopic and medical laboratory investigations as shown in table 1. The patient's Amylase -214U/L on admission showed elevated amylase levels which hinted a sign of active gastrointestinal inflammation or pathology.

Assessment

-Peritonitis secondary to perforated viscus (query cause)?

-Rule in Peptic Ulcer Disease

Plan

-After initial investigations by the attending resident on call, the patient was subsequently admitted to the male surgical ward (admission date: 21/12/2020 at 9:25pm)

-Intravenous access with 3L of 0.9% normal saline was administered over 24 hours and 500mL of ringer's lactate was to be administered.

-Consent for exploratory laparotomy with or without stoma was sought

-Consent for Blood transfusion was obtained

-Nasogastric tube was continued on free drainage

-Monitoring of urine input and output charts

-Electrocardiogram was done ahead of surgery

-1g of baralgin to be administered intravenously/parenterally

-Patient was reviewed by Anesthesia team

- Patient was to be kept nil per oral in preparation for surgery the following day

Pre-Operative Plan

Preoperative diagnosis: Perforated viscus
Patient had labs taken with no significant changes in relation to the values presented during admission at the emergency

-Patient was scheduled for OT on 22/12/2020 with laboratory tests repeated and assessment by anesthesia was made. The patient had intravenous fluids for management of any possible electrolyte deficits (0.9% normal saline and ringers' lactate). He was kept Nil per oral (NPO) and analgesia (pethidine 75mg IV stat) was administered for pain management IV stat, then tapered and given every 6 hours for 24 hours.

-Rocephin 1g IV and flagyl 500 mg IV tabs given as prophylaxis

-Electrocardiogram was repeated. Readings showed normal sinus rhythm with normal rate and rhythm. In addition to normal preoperative routine investigations carried out, ECG was taken to rule out underlying cardiac arrhythmias or silent myocardial infarctions that could occur intraoperatively as the patient is currently receiving pain medications and anesthesia that could potentially mask an acute presentation.

Operative Report

Date of operation: 22/12/2020.

Time Started: 7:45 pm

Time ended: 9:12 pm

Operation procedure: Exploratory Laparotomy with modified Grahams Patch [7, 10, 11].

Patient was seen lying sedated under general anesthesia.

Findings: Intraoperative findings entailed a perforation at the prepyloric region on anterior surface of the stomach.

Post-operative diagnosis: Perforated prepyloric peptic ulcer.

Procedure: Patient was cleaned and draped under sterile conditions.

-A midline incision was made with dissection of the abdominal wall down to the fascia

-fascia was opened and abdomen was explored. 2 liters of gastric fluid was suctioned from the abdomen after which, the abdomen was washed with normal saline.

-A Grahams patch technique was implemented with 3 inches of omentum immobilized from the transverse colon to the pylorus.

-Fascia was closed with prolene suture followed with closure of the skin with zipper stitch with prolene subcuticular. Wound was dressed

Post-Operative Plan: Patient was transferred to the ward upon awakening and was administered intravenous maintenance fluids at 2.5L of ringers' lactate for 24 hours.

Patient was still kept nil per oral with nasogastric tube on free drainage. Pethidine (meperidine) 75mg was given 6hrly for 24 hours and intravenous gravol

(Dimenhydrinate) 50mg, 6 hourly for 24 hours.

-40 mg Pantecta (pantoprazole)

-commencement of triple therapy upon discharge was ordered, with the regimen comprising of clarithromycin 500mg twice daily for 2 months, amoxicillin 1 g per oral for 2 months and Omeprazole 40 mg twice daily for 2 months and then tapered to 1month

-Management entailed continuation of ceftriaxone (Rocephin) + flagyl + heparin for postinfectious complications and deep venous thrombosis prophylaxis respectively.

-Continuous routine monitoring of vitals.

Day 1 post exploratory laparotomy follow up:

Following the procedure of exploratory laparotomy with modified Grahams Patch secondary to perforated prepyloric gastric ulcer, on subjective assessment of the patient, the patient stated he "feels better"

Under examination, the middle-aged male patient was seen in no distress. Mucous membranes are moist and pink, the patient was anicteric, acyanotic and afebrile. Nasogastric tube and urinary catheter were noted in situ with minimal bilious drainage and amber colored urine, respectively. Bandage is seen to the midline and is clean and intact. Soft dressing surrounding surgical site and there were no organomegaly or surrounding masses.

Breath sounds were vesicular and there were audible heart sounds on auscultation.

Patient was alert and oriented to time, place and person. The vital signs are: Bp 110/72 mmHg;

RR: 20 breaths per minute and SpO₂ 98%. The Patient was still on medications as prescribed

Post-Operative Assessment: Clinically stable.

Plan: Continue nasogastric tube on free drainage. Intravenous access for administration of fluids (3 liters) 0.9% normal saline for 24 hours. The patient was administered analgesia (meperidine). Patient was maintained on a nil per oral diet with daily wound dressings. Proton pump inhibitor therapy was continued, and early ambulation was encouraged.

Day 2 post Exploratory Laparotomy: No significant changes in management in relation to post-operative day 1. Patient had nil complaints and was in no distress on physical examination, the patient appeared clinically stable and was able to step out of the bed after assessment of vitals and laboratory examinations. Wound dressing was observed as required.

Day 3 Post-Exploratory Laparotomy: Patient was seen and noted to be clinically stable.

No significant changes as compared to the above.

Day 4 Post-Exploratory Laparotomy with modified Grahams Patch: The middle aged male patient was seen in no distress. Mucous membranes are moist and pink. He's acyanotic, afebrile and anicteric. Vital readings were: Blood pressure: 127/86mmHg; Pulse rate - 72 bpm, RR - 16 breaths per minute; Temperature - 37.6°C. On inspection of the abdomen, there was a midline bandage seen, and was noted to be intact. Abdomen was soft and non-tender to palpation, no organomegaly or

masses were palpated. Surgical site and dressings are intact. Cardiopulmonary and central nervous system examinations were unremarkable. The patient was assessed to be clinically stable.

The plan was to continue observation and monitoring of vitals.

Day 5 Post-Exploratory Laparotomy with Modified Graham Patch (28/12/2020) +

Discharge: The patient was assessed during rounds and was determined to be clinically stable. The surgical dressing and sutures were removed, and wound was closed. The patient was planned for discharge on the same day, with triple therapy (clarithromycin, amoxicillin and pantoprazole) and wound closure with a scheduled follow up visit in one week at the surgical outpatient department.

Case Discussion

Peptic ulcer disease is a progressive disease characterized pathologically by ulceration of the mucosa of the stomach, duodenum and sometimes there is involvement of the distal esophagus and Meckel's diverticulum. There is disruption of mucosal integrity and defenses by aggressive host factors (smoking, alcohol abuse, obesity and use of nonsteroidal anti-inflammatory agents and Infection with *H. pylori*). It is characterized clinically by epigastric pain and dyspepsia (symptoms of indigestion e.g., heartburn, nausea, abdominal pain, early satiety) with remission and relapses [2, 6,8].

Most patients with a history of ulcers, presenting with an acute episode, usually have predisposing risk factors or antecedent events that triggered the unmasking of the underlying ulcer. Severe acute presentations indicate a complicated ulcer that could be due to bleeding, perforation or obstruction

indicating a need for urgent surgical repair [10, 11, 18].

These complications ultimately require surgical intervention but a stepwise approach to the evaluation, diagnosis, interventions and general management of complicated peptic ulcer disease will be discussed further below in relation to the presentation of the patient's case above, as the management and prognosis is dependent on the location of the ulcer, *H. pylori* culture status, underlying comorbid conditions and prophylactic surgical interventions done to control relapse.

The initial resuscitating interventions done on our patient included the administration of analgesia (gravol) for immediate management of the pain, an upright chest X-ray scan followed by administration of intravenous fluids and bowel rest, all done while the patient was being assessed and worked up for emergent surgery.

General Approach: After stabilizing the patient and ruling out a complicated peptic ulcer in the acute setting (negative pneumoperitoneum on upright X-ray), further workup should begin with upper abdominal endoscopic examination to evaluate for ulcers or any potential mucosal lesion or neoplasm. If malignancy is present, management should proceed as documented. A biopsy should be obtained to test for *H. pylori*. If there are visible ulcers on endoscopy and *H. pylori* test return a positive result, a diagnosis of peptic ulcer disease can be made, and it is important to enquire if the patient if he or she is

currently receiving medication for active PUD. If the biopsy result yields a negative *H. pylori* test, further investigations need to be carried out to rule out other differentials or potential causes of the patient's symptoms. In this case of a negative finding with both investigations (endoscopic biopsy), an ultrasound and computed sonography of the gallbladder, biliary tree, liver and pancreas should be obtained to rule out pathologies from those sites [6].

After these initial investigations, planned surgery followed with triple therapy treatment for *H. pylori* should be done to address the complications associated with PUD. The complications of peptic ulcer include intractability, gastric outlet obstruction, bleeding and perforation with bleeding ulcers requiring hospitalization having a mortality rate of 10% to 30% and perforated ulcers having a mortality rate of 5% to 35% [3, 10, 19]. The surgical management of bleeding peptic ulcers require selective vagotomy or vagotomy with drainage. Perforated ulcers can be managed surgically by covering the perforated site with omentum (Grahams Patch) which was used in management of our patient. This technique is very effective in patients with this complication especially in patients with first-time complicated peptic ulcer disease without an extensive history of ulcer disease, decreasing risk of relapse. The triple therapy regimen has aided surgeons in choosing less aggressive forms of management like vagotomy. Surgical management of the ulcer also depends on its location [20].

Table 2 provides the types of gastric ulcers from I to IV and their relative surgical interventions.

Table 2 Gastric ulcers from I to IV and their relative surgical interventions

Type	Location	Acid Output + <i>H.pylori</i>	Surgery
I	Lesser curvature	Low and its strongly linked to <i>H.pylori</i>	Distal gastrectomy/vagotomy + drainage
II	Gastric body + duodenal ulcer	High acid output	Vagotomy with drainage
III	Prepyloric	High	Vagotomy with drainage
IV	Gastro-esophageal junction	Low	Highly selective vagotomy + drainage

Patient Approach Vs General Approach

Following the resuscitation of our patient who is a 49-year-old male, a diagnosis of peptic ulcer disease was made on the basis of his clinical presentation, laboratory and image findings detailing pneumoperitoneum. He did not report any symptoms as compared to his earlier presentation. He was not assessed via endoscopy due to his acute presentation and resource constraints in the emergency department as opposed to the general approach.

His laboratory tests indicated elevated leukocytes, amylase and lactate levels along with electrolyte derangements pointing to an active process within the system. The patient had a nasogastric tube in place for decompression (due to possible complication by obstruction) and to evaluate for possible upper gastrointestinal bleed. The contents of the aspirate yielded bilious material but no blood, so it was presumed not to have been complicated by bleeding. Hence,

the administration of gravol (with anticholinergic properties) to aid in decrease acid output was done and the patient was prepped for exploratory laparotomy [21-23].

Following the surgery, a post-operative diagnosis of pre-pyloric anterior gastric ulcer was made, and was deduced to be a Type 1 gastric ulcer. It was managed surgically with omental repair (Grahams Patch) since the ulcer was confined to the body of the stomach without concomitant ulcer involvement of the duodenum (Type II gastric ulcers) which will warrant highly selective vagotomy and pyloroplasty [10].

Most patients that present with ulcer perforation without an extensive history of ulcers and ulcer treatments can have the perforation closed with an omental patch, followed with medical management with eradication of *H.pylori*, in this case of our patient, 3 inches of the omentum from the transverse colon was mobilized and the patient was taken

back to the ward, observed and discharged on triple regimen [12].

Potential complication of Grahams patch includes abdominal abscess, which can be managed with copious irrigation and antibiotics; gastric outlet obstruction managed by preventing the duodenum from narrowing and recurrent perforation (relapse) treated by eradication of *H. pylori* [12]. This approach and general approaches were employed for this patient in such an emergency situation which is in agreement with the work of Lee et al. [23] and was discharged after 5 days of care.

Conclusion

This case study has provided a detailed review on the Peptic ulcer disease management from the educational, research and practice points of view. This case of a 49 year old male subject amidst other management strategies including herbal medicine especially in Africa, provides an additional literature and knowledge in the surgical approach in the management of PUD. Surgery management aspect of PUD is hereby encouraged among the PUD sufferers in addition to general approaches noted under a careful and attentive monitoring of the Surgeon and other associated health professionals.

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