Diagnostic Laparoscopy for Chronic Abdominal Pain

Richmond University Hospital, July 2012
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Case Presentation

HPI

• 25 y/o female with no significant PMH who was seen in clinic c/o intermittent, moderate to severe, dull abdominal pain, located in epigastric area and right abdomen for the last 3 years. Patient denied any other symptoms (N/V, weight loss)

• PMH: None

• PSH: None
Case Presentation

• Work up:
  • EGD: No pathologic findings
  • RUQ US: No gallstones or other biliary or liver pathology
  • Pelvic US: No GYN pathology
Case Presentation

• Work up:

• CT scan abdomen and pelvis with PO/IV contrast:
  • Probable diverticulum in the ascending colon
  • Otherwise unremarkable
Case Presentation

• Work up:
  
  • Colonoscopy:
    • 0.5 cm sessile, friable mass in the distal ascending colon
    • Mass was removed with cold technique
    • Area was tattooed with India ink and sent to pathology
    • Rest of the study was unremarkable for any pathology
Case Presentation

• Work up:

• Pathology: Colonic mucosa with hyperplastic change. No granulomas. No crypt abscesses, no dysplasia
Case Presentation

• **Work up:**
  
  • **CBC:** 6.9>14.5/46.0<439
  
  • **BMP:** 139/4.0/100.4/27.4/4.9/0.8<95
• After extensive diagnostic work up, cause of chronic abdominal pain was unclear

• Patient was scheduled for exploratory laparoscopy
Case Presentation

- 3 ports
  - 10 mm at umbilicus
  - 5 mm subxyphoid
  - 5 mm right mid abdomen

- Abdomen was thoroughly explored in 4 quadrants
Case Presentation

- Findings
  - Normal appearing liver
  - Min adhesions in undersurface of gallbladder
Case Presentation

- **Findings**
  - Normal appearing small bowel, appendix, right, transverse, left and sigmoid colon
Findings

- India ink staining from cecum, up to mid ascending colon with staining of lymph nodes in the mesocolon
Case Presentation

- **Findings**
  - Min enlarged uterus. Small cysts in right ovary
  - Yellowish fluid in the pelvis
Case Presentation

- Excisional biopsy of India ink stained lymph node in right mesocolon
- 10 cc aspirate of pelvic fluid for cytology
Patient was discharged home same day of surgery

Follow up in office, patient doing well

Back to baseline state of health
Pelvic fluid:
- Reactive mesothelial cells. Acute and chronic inflammatory cells

Lymph node in right mesocolon:
- Reactive lymph node with follicular hyperplasia
Case Presentation

Questions?
Abdominal Pain

The following arbitrary definitions are often helpful when formulating a differential diagnosis:

- Acute: Continuous or intermittent abdominal discomfort lasting from hours to several days.
Abdominal Pain

• **Sub acute:** Continuous or intermittent abdominal discomfort lasting from several days but less than 6 months

• **Chronic:** Continuous or intermittent abdominal discomfort lasting for at least 6 months
Abdominal Pain

- **Acute**
  - Typically seen in ER, Floor, ICU

- **Chronic**
  - Typically seen outpatient
  - Often Worked up by multiple other physicians
  - Negative workup to date
  - History of prior surgery is common
Abdominal Pain

- Chronic
  - Often referred because pain felt to be secondary to adhesions

- All noninvasive studies have often been performed and negative
  - CT/MRI
  - Barium/Gastrograffin Enema
  - Sono, Cystogram
  - Upper and lower endoscopy
Chronic Abdominal Pain

- Pain may arise from any system, including the genitourinary, gastrointestinal, and gynecologic tracts
- A clear relationship with an anatomic structure or underlying process may not always be present
Chronic Abdominal Pain

Classification

- **Organic:**
  - Clear anatomic, physiologic, or metabolic cause

- **Functional:**
  - Chronic abdominal pain without any clear source, in spite of a thorough diagnostic evaluation

- Chronic abdominal pain is less likely to reveal underlying organic pathology than acute abdominal pain
Chronic Abdominal Pain

- Common complaint in primary care and subspecialty clinics

- Prevalence of the condition is unknown

- Epidemiologic data suggest that the incidence of unspecified abdominal pain is 22.9 per 1000 person-years

- Prevalence is equal across different age groups, ethnicities, and geographic regions
Chronic Abdominal Pain

- Diagnosis and management often challenging

- Factors:
  - Poor sensitivity of the history and physical exam
  - Broad differential diagnosis that crosses several specialties
  - Often negative diagnostic work-up.
Chronic Abdominal Pain

Differential Diagnosis

• Structural (or Organic) Disorders
  • Inflammatory
    • Appendicitis
    • Celiac disease
    • Eosinophilic gastroenteritis
    • Fibrosing mesenteritis (mesenteric panniculitis)
    • IBD
    • Pelvic inflammatory diseases
    • Primary sclerosing cholangitis
Chronic Abdominal Pain
Differential Diagnosis

- **Structural (or Organic) Disorders**
  - **Vascular**
    - Celiac artery syndrome
    - Mesenteric ischemia
    - Superior mesenteric artery syndrome

- **Metabolic**
  - Diabetic neuropathy
  - Hereditary angioedema
  - Porphyria
Chronic Abdominal Pain
Differential Diagnosis

• Structural (or Organic) Disorders
  • Neuromuscular
    • Anterior cutaneous nerve entrapment syndrome
    • Myofascial pain syndrome
    • Slipping rib syndrome
    • Thoracic nerve radiculopathy
Chronic Abdominal Pain
Differential Diagnosis

• Other Structural (or Organic) Disorders

• Abdominal adhesions
• Abdominal neoplasms
• Anaphylaxis
• Chronic pancreatitis
• Endometriosis
• Gallstones
• Hernias

• Intestinal malrotation
• Intestinal obstruction
• Lactose intolerance
• Peptic ulcer disease
• Small intestinal and pelvic lipomatosis
Chronic Abdominal Pain
Differential Diagnosis

- Functional Gastrointestinal Disorders
  - Biliary pain (gallbladder or sphincter of Oddi dysfunction)
  - Functional abdominal pain syndrome
  - Functional (nonulcer) dyspepsia
  - Gastroparesis
  - Irritable bowel syndrome
  - Levator ani syndrome
Chronic Abdominal Pain

Urgent Considerations

- Urgent Considerations
  - Any change in the description of pain or emergence of new symptoms should alert to an acute-on-chronic condition
    - Tachycardia, tachypnea, hypotension
    - Fever, vomiting, obstipation
    - Syncope, concomitant chest or back pain
    - Respiratory distress
    - Acute vaginal or GI bleeding
Chronic Abdominal Pain
Diagnostic Approach

• 4 major components
  • History
  • Physical exam
  • Psychosocial assessment
  • Investigations
Chronic Abdominal Pain

Diagnostic Approach

• History:

Localization of pain

• Epigastric/upper abdominal pain
  • Esophageal, stomach, duodenal, gallbladder, pancreas
• Lower abdominal pain
  • Large bowel (left or right sided symptoms)
• Pelvic pain:
  • Gynecologic origin
  • Chronic pelvic pain syndrome
• Localized point
  • Chronic abdominal wall pain
  • Abdominal cutaneous nerve entrapment syndrome
  • Kidneys, ureters, and ovaries

• Patient's perception of the anatomic distribution
Chronic Abdominal Pain
Diagnostic Approach

• History:
  • Exacerbating and relieving factors
  • Associated symptoms
    • Fever, chills
    • Night sweats
    • Nausea and vomiting
    • Diarrhea, constipation, bloody stools
    • Change in appetite or bowel habit
    • Weight loss/gain
Chronic Abdominal Pain

Diagnostic Approach

• Physical exam
  • Thorough exam
  • Vital signs
  • Head and neck exam
  • Skin and mouth
  • Thorax (ribs and spine), lower back
• Peripheral vascular exam
• Rectal/pelvic examination
Chronic Abdominal Pain
Diagnostic Approach

- Psychosocial assessment
  - Association between chronic abdominal pain
    - History of PTSD, abuse
    - Somatization, anxiety, depression
Chronic Abdominal Pain
Diagnostic Approach

- **Investigations**
  - Appropriate investigations should be tailored to history and exam findings
  - Laboratory and imaging tests should be ordered in a conservative and cost-effective manner
  - Ask about previous investigations. Existing information may be available for review
Chronic Abdominal Pain
Diagnostic Approach

• Investigations
  • Laboratory
    • Standard laboratory tests
      • CBC with differential
      • Platelet count/ESR
      • Serum electrolytes
      • Glucose, creatinine, BUN
      • Liver function tests
      • Lipase/amylase
      • UA
Chronic Abdominal Pain
Diagnostic Approach

• **Investigations**
  • **Laboratory**
    • Stool tests (Cx, O & P)
    • Urine/serum pregnancy test
  • Serology *H pylori*
  • GYN (Vaginal swabs, pap smears)
Chronic Abdominal Pain
Diagnostic Approach

- Investigations
  - Endoscopy:
    - > 50 y/o
    - Upper endoscopy: Pain in the upper abdomen + upper GI symptoms (early satiety, nausea, vomiting)
    - Colonoscopy: pain in lower abdomen and/or it is associated with changes in bowel habits
Chronic Abdominal Pain
Diagnostic Approach

- Investigations
  - Imaging
    - Upper US
      - RUQ/epigastric pain
      - Pelvic, transvaginal, transrectal US
    - Lower abdominal pain
Chronic Abdominal Pain
Diagnostic Approach

- Investigations
  - Imaging
    - CT scanning
      - Dilated intestinal loops
      - R/o partial intestinal obstruction
      - Abnormalities in other abdominal organs (pancreas, liver, kidneys)
      - Inflammatory processes
      - Retroperitoneal or pelvic masses
Chronic Abdominal Pain
Diagnostic Approach

• Functional GI disorders
  • All investigations are negative
  • Irritable bowel syndrome and functional dyspepsia most common
• Functional abdominal pain syndrome (FAPS)
  • Pain located in the abdomen (not pelvis)
  • Non related to food intake or defecation
Chronic Abdominal Pain

Diagnostic Approach

• Functional abdominal pain syndrome (FAPS)
  • Associated with loss of daily activities, and present for >6 months
  • Cannot be explained by structural/metabolic disorders
  • It is believed to be related to altered pain perception and pain modulation circuits.
Chronic Abdominal Pain (CAP)

- Role of Laparoscopy
  - Many patients with CAP have undergone numerous diagnostic workups
  - 40% patients had no specific etiological diagnosis at the end of their diagnostic workup
  - After ruling out common diseases many patients are still underdiagnosed
  - Introduction of laparoscopic surgery added a new diagnostic tool
Contraindications to Laparoscopy

- Multiple prior surgeries ("hostile abdomen")
- Third Trimester Pregnancy
- Increased Intracranial Pressure
- Marked Obesity (?)
- Massive Distention from Dilated Bowel
Before OR
Be Prepared

• Optimize patient
  • Medically stable, electrolytes normal

• Review prior OR reports if possible

• Review Prior Films/Update Imaging
  • These modalities should be of high quality and within a narrow window (within 6 months)

• Bladder Catheterization

• Decompress Bowel
  • NGT if bowel distention

• Consent
• Risks and benefits of open and laparoscopic approaches
• Laparoscopy is an approach not a commitment
• Laparoscopy may just be an aid in diagnosis, not a manner in which the problem can be entirely fixed or cured
• Prepare patient for
  • Conversion to open
  • Bowel resection
  • Possible Ostomy
Important

- **Clear goals, Realistic Expectations**
  - Pain may NOT improve after laparoscopy
  - May be an initial placebo effect
  - Pain may return (i.e. with adhesions)

- **Adequate instrumentation**
  - 30 degree scope facilitates visualization of certain areas of abdomen
  - Suction/irrigation

- **Surgeon skills**
  - Comfort in exploring all relevant surgical spaces laparoscopically (probably most important for the diagnostic success)
  - Ability to run the bowel
  - Resect, suture, ties, anastomose laparoscopically (?)
• Open Hasson Technique
  • At umbilicus or (if prior midline scarring expected) away from prior scars/midline
  • Veress needle may be the preference of some surgeons
  • 30 degree laparoscope
• Panoramic view of abdomen looking for clues
  • Adhesions, phlegmon, ascites, position of omentum, fibrinous adhesions, bowel distention
  • This initial view will guide further port placement
• **Port/Trocar Positioning**
  - Start with 5 mm (can be upsized if necessary)
  - Adhere to principles of triangulation of instruments

• **Patient Positioning**
  - Trendelenberg position for lower abdomen
  - Reverse trendelenberg for upper abdominal pathology
  - Tilt patient with affected side up

• **Findings must be congruent with the patient’s complaints**
  - Unrelated findings may have nothing to do with patient’s symptoms
  - Know the patient’s subjective history well
Surgical Approach

• Meticulous inspection of abdomen
  • Liver
  • All surfaces of the stomach (open lesser sac)
  • Duodenum and pancreas
  • Run small bowel from Ligament of Treitz to ileocecal area
    » Look for Meckel’s diverticulum
  • Colon: appendix, ascending, transverse (lift up omentum), descending, sigmoid and rectum
  • Women: Uterus, fallopian tubes, ovaries

• Correlation between findings and patient’s complaints are important
Utility of Laparoscopy in Chronic Abdominal Pain

- 70 patients (61 females, 9 males)
- Average length of time with pain 74 weeks (12-260 weeks)
- Inclusion criteria: unexplained pain for at least 12 weeks
- Excluded: Patients with bowel obstructions

Oonders et al. Surgery Oct 2003 549-552
Utility of Laparoscopy in Chronic Abdominal Pain

- No conversions to open
- 39 adhesions, 13 hernias, 6 appendiceal adhesions, 5 appendiceal pathology, 3 endometriosis, 2 gallbladder
- 10 no pathology
- 90% relief at initial visit
- 71 % relief long term (>6 months)
- No recurrence of pain beyond 6 months

Onders et al. Surgery Oct 2003 549-552
Complication and feasibility of laparoscopic adhesiolysis in patients with chronic abdominal pain

- Inclusion Criteria: intermittent or continuous abdominal pain for at least 1 month
- Exclusion criteria:
  - Patients with identifiable process that would could explain the pain
  - Acute or inflammatory process

Swank et al. Surg Endoscopy 2002 1466-1473
Complication and feasibility of laparoscopic adhesiolysis in patients with chronic abdominal pain

- 7 patients converted
- 16 had major complications
- 11 visceral perforations
- 2 deaths
- 80% had relief at short term followup (6 weeks)

Swank et al. Surg Endoscopy 2002 1466-1473
Laparoscopic adhesiolysis in patients with chronic abdominal pain: a blinded randomized controlled multi-center trial

- Chronic abdominal pain attributed to adhesions. Other causes of pain had been excluded
- If adhesions were confirmed during diagnostic laparoscopy, patients were randomly assigned either to laparoscopic adhesiolysis or no treatment
- Treatment allocation was concealed from patients, and assessors
- Pain was assessed for 1 year by visual analogue score (VAS) score (scale 0–100), pain change score, use of analgesics, and quality of life score

Laparoscopic adhesiolysis in patients with chronic abdominal pain: a blinded randomized controlled multi-center trial

- 116 patients enrolled for diagnostic laparoscopy
- 100 were randomly allocated either laparoscopic adhesiolysis (52) or no treatment (48)
- Both groups reported substantial pain relief and a significantly improved quality of life
- No difference between the groups (3 pts) (p=0.53; 95% CI)
- Although laparoscopic adhesiolysis relieves chronic abdominal pain, it is not more beneficial than diagnostic laparoscopy alone
- Laparoscopic adhesiolysis cannot be recommended as a treatment for adhesions in patients with chronic abdominal pain

The efficacy of laparoscopy in the diagnosis and management of chronic abdominal pain

- Prospective descriptive cross-sectional study
- 30 patients with chronic abdominal pain were included
- The pain in all patients was of unclear etiology despite all the investigative procedures
- Patients were subjected to laparoscopic evaluation for their conditions

The efficacy of laparoscopy in the diagnosis and management of chronic abdominal pain

Baseline characteristics of the studied patients

<table>
<thead>
<tr>
<th>Characters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) mean (range)</td>
<td>36 (20-68)</td>
</tr>
<tr>
<td>Gender Male</td>
<td>12 (40%)</td>
</tr>
<tr>
<td>Gender Female</td>
<td>18 (60)</td>
</tr>
<tr>
<td>Body mass index</td>
<td>29.3 (18-41)</td>
</tr>
<tr>
<td>Duration of pain (months) Mean (range)</td>
<td>9 (3-15)</td>
</tr>
<tr>
<td>Site of pain</td>
<td></td>
</tr>
<tr>
<td>Right lower quadrant</td>
<td>7 (23.3%)</td>
</tr>
<tr>
<td>Right upper quadrant</td>
<td>6 (20%)</td>
</tr>
<tr>
<td>Left lower quadrant</td>
<td>3 (10%)</td>
</tr>
<tr>
<td>Left upper quadrant</td>
<td>5 (16.7%)</td>
</tr>
<tr>
<td>Periumbilical</td>
<td>9 (30%)</td>
</tr>
<tr>
<td>History of previous abdominal surgery</td>
<td>17 (56.7%)</td>
</tr>
<tr>
<td>Appendectomy</td>
<td>9</td>
</tr>
<tr>
<td>Colecystectomy</td>
<td>5</td>
</tr>
<tr>
<td>Splenectomy</td>
<td>2</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>1</td>
</tr>
</tbody>
</table>
The efficacy of laparoscopy in the diagnosis and management of chronic abdominal pain

Laparoscopic findings, intraoperative data, and postoperative characteristics

<table>
<thead>
<tr>
<th>Findings</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of operation (minutes)</td>
<td>58.7 ± 14.1</td>
</tr>
<tr>
<td>Mean ± SD (range)</td>
<td>(30 – 120)</td>
</tr>
<tr>
<td>Laparoscopic findings</td>
<td></td>
</tr>
<tr>
<td>Adhesions</td>
<td>(63.3%)</td>
</tr>
<tr>
<td>Hernia</td>
<td>(3.3%)</td>
</tr>
<tr>
<td>Abnormal appendix</td>
<td>(10%)</td>
</tr>
<tr>
<td>Abnormal gall bladder</td>
<td>(3.3%)</td>
</tr>
<tr>
<td>Enlarged lymph node</td>
<td>(3.3%)</td>
</tr>
<tr>
<td>Normal</td>
<td>(16.7%)</td>
</tr>
<tr>
<td>Postoperative complications</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>(83.3%)</td>
</tr>
<tr>
<td>Bleeding</td>
<td>(6.7%)</td>
</tr>
<tr>
<td>Infection</td>
<td>(10%)</td>
</tr>
<tr>
<td>Postoperative hospital stay (days)</td>
<td>3.6 (2 – 9)</td>
</tr>
</tbody>
</table>
The efficacy of laparoscopy in the diagnosis and management of chronic abdominal pain

- Most common site of pain was the periumbilical region (30%)
- Definitive diagnosis was made in 25 patients (83.3%)
- 5 patients (16.7%) had no obvious pathology
- Adhesions were the most common laparoscopic findings (63.3%)
- Postoperatively, pain relief was achieved in 24 patients (80%) after two months

The efficacy of laparoscopy in the diagnosis and management of chronic abdominal pain

- In selected patients, laparoscopic evaluation of CAP is usually associated with a positive outcome (80%) in terms of less or no pain, after two months of laparoscopy and in 70% and 63% of the patients, after six months and one year, respectively

- Finding is justified in many previous studies

The efficacy of laparoscopy in the diagnosis and management of chronic abdominal pain

• However, the role of laparoscopy from the therapeutic point of view is still ignored by some authors, especially its role in adhesiolysis.

• In conclusion, laparoscopy has an effective diagnostic role in evaluating patients with chronic abdominal pain, in whom conventional methods of investigations have failed to elicit a certain cause.

• The therapeutic value of laparoscopy is also accepted and appreciated.

Conclusions

• Laparoscopy provides an opportunity to diagnose and treat some chronic intraabdominal conditions

• Many chronic conditions are best diagnosed less invasively by radiologic imaging or endoscopy/visualization techniques therefore these modalities should be completed and reviewed prior to diagnostic laparoscopy

• Diagnostic laparoscopy should only be performed in highly selected patients; expectations and goals of the surgery should be clear
Conclusions

• Thorough exploration of all possible areas of abnormality should be performed with focus on the areas of patient’s reported pain
• Diagnostic laparoscopy is effective at identifying and treating some sources of chronic abdominal pain
• The role of adhesions in chronic abdominal pain is debatable
Question #1

All of the following are standard steps in diagnostic laparoscopy for chronic abdominal pain except:

- a. Panoramic view of abdomen
- b. Appendectomy
- c. Placement of Hassan trocar in virgin area of abdomen
- d. Meticulous inspection of liver and surface of stomach
- e. Running small bowel from Ligament of Treitz to ileocecal valve
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Question #2

- What is the most common cause of bowel injury during a laparoscopic case?
  - A. Thermal Injury
  - B. Grasper Injury
  - C. Scissor Injury
  - D. Trocar Insertion
  - E. Specimen Extraction
Question #2

• What is the most common cause of bowel injury during a laparoscopic case?
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  • E. Specimen Extraction
A 30 year old woman undergoes diagnostic laparoscopy for chronic abdominal pain. Pelvic endometrial implants are detected and cauterized. 2 days later, she experiences rectal bleeding, fever and abdominal pain. Which of the following is the most appropriate management?

A. CT of the pelvis
B. Tagged erythrocyte scan
C. Upright radiograph of the chest
D. Rigid Proctoscopy
E. Colonoscopy
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