EXAMINATION OF THE GI TRACT

Aim: Optimal use of endoscopic and/or radiologic imaging techniques to reach maximal information without causing less trouble for the patient
Essential role of GI tract

• Absorption of nutrients
• Excretion
• Maintaining coordinated passage
Approach to the patient

- To take thorough history
- Physical examination
- Laboratory investigations (blood, stool, Helicobacter pylori, etc)
- Ultrasound
- Endoscopy
- X-ray (plain film)
- CT, MRI, angiography, isotope scan, PET, selective enterography, capsullar video endoscopy
HISTORY

complain: when, where, what is it like?

- ABDOMINAL PAIN
- ALTERATION IN BOWEL HABIT
- Difficulties in swallowing, NAUSEA, VOMITUS
- BLEEDING: hemathemesis, melena, hematochezia
- GENERAL MEDICAL HISTORY
- FAMILY HISTORY
Main principles

- Immediate distinction between urgent problem and nonacute disorder
- Determination of the temporal evolution of symptoms and to be able to differentiate between organic and psychosomatic alterations
- Consider all information to avoid unnecessary tests in the workup
<table>
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<tr>
<th>Site of Disorder</th>
<th>Common Symptoms</th>
<th>Possible Physical Signs</th>
<th>Potential Procedures or Laboratory Studies</th>
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<tbody>
<tr>
<td>Esophagus</td>
<td>Dysphagia, upper/lower esophagea, heartburn, chest pain, Hematemesis/melena</td>
<td>Distention, Tenderness, Suscussion splash</td>
<td>Esophagoscopy, Barium swallow, Manometry, Bernstein test, Gastroscopy, Upper GI x-ray series, Nasogastric aspiration, Gastric emptying, Kidney-ureter-bladder x-ray series, Qualitative stool fat and muscle fiber, US, CT, MRI, endoscopic retrograde cholangiopancreatography, Pancreatic function tests</td>
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<tr>
<td>Stomach</td>
<td>Nausea and vomiting, Epigastric pain, Hematemesis/melena, Early satiety</td>
<td>Mass, Jaundice</td>
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<tr>
<td>Pancreas</td>
<td>Pain, Weight loss, Diarrhea, Steatorrhea</td>
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<tr>
<td>Small Intestine</td>
<td>Pain, Nausea/vomiting, Hematemesis</td>
<td>Tenderness, Altered bowel sounds, Distention, Mass</td>
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<tr>
<td>Duodenum</td>
<td></td>
<td>Duodenoscopy, Small bowel follow-through, enteroclysis, Kidney-ureter-bladder x-ray series, D-Xylose absorption tests, CT, Stool cultures, stool examination for ova and parasites, Small bowel biopsy</td>
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<tr>
<td>Jejunum</td>
<td>Pain, Diarrhea</td>
<td>Altered bowel sounds, Distention, Mass</td>
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<tr>
<td>Ileum</td>
<td>Pain, Diarrhea</td>
<td>Altered bowel sounds, Distention, Mass</td>
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<tr>
<td>Colon</td>
<td>Diarrhea, Pain, Blood</td>
<td>Tenderness, Mass, Distention</td>
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<tr>
<td>Rectum</td>
<td>Pain, Urgency, Hematochezia, Pruritus</td>
<td>Tenderness</td>
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<tr>
<td>Nonspecific</td>
<td>Weight loss, Fever, Anorexia, Nausea and vomiting</td>
<td>Complete blood count, Erythrocyte sedimentation rate, Fecal occult blood test</td>
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<tr>
<td>Presentation and Associated Findings</td>
<td>Possible Causes</td>
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<tr>
<td><strong>PREDOMINANTLY NAUSEA</strong></td>
<td>Pregnancy, medications, hypercalcemia, uremia, radiation therapy, psychogenic.</td>
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<tr>
<td><strong>ACUTE VOMITING</strong></td>
<td>Migraine, labyrinthitis, motion sickness, Meniere's disease, glaucoma, intracranial hypertension.</td>
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<tr>
<td>Associated with neurologic symptoms (headache, vertigo, diplopia)</td>
<td>Myocardial infarction, congestive heart failure, accelerated hypertension, arrhythmias.</td>
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<td>Associated with cardiovascular symptoms</td>
<td>Viral gastroenteritis, food poisoning (<em>Salmonella</em>, <em>Staphylococcus aureus</em>).</td>
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<td>Associated with self-limited flu-like symptoms</td>
<td>Gastritis, peptic ulcer disease, gastric outlet obstruction, small bowel obstruction, ileus, ischemic bowel, pancreatitis, cholecystitis, cholangitis, hepatitis, liver abscess, peritonitis, appendicitis, salpingitis, renal colic, pyelonephritis, ketoacidosis, Addisonian crisis, thyroid storm.</td>
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<tr>
<td>Associated with gastrointestinal symptoms</td>
<td>Most agents: major morbidity with cisplatin, doxorubicin, alkylating agents, cytarabine.</td>
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<td>Associated with medications Antitumor chemotherapy Disulfiram type reaction with alcohol Others</td>
<td>Disulfiram, chlorpropamide, nitrates, isoniazid, metronidazole, quinacrine, sulfonamides, tolbutamide.</td>
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<td><strong>CHRONIC VOMITING</strong></td>
<td>Narcotics, iron, erythromycin, estrogens, digoxin, aminophylline, antiarrhythmics, ergot alkaloids, NSAIDs.</td>
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<td>Gastroduodenal Postgastrectomy Intestinal</td>
<td>Gastric ulcer, diabetic gastroparesis, gastric cancer, gastro-duodenal motility disorders, bezoar, gastrocolic fistula, amyloidosi.</td>
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<td>Psychologic Others</td>
<td>Anastomotic ulcer, bile gastritis, bezoar, afferent loop syndrome, obstructed anastomosis, vagotomy-induced delayed emptying, cancer.</td>
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<td>Parasytic diseases (giardiasis, hookworm, strongyloidiasis), Crohn's disease, pseudo- obstruction, partial small bowel obstruction, eosinophilic gastroenteritis, superior mesenteric artery syndrome.</td>
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<td>Psychogenic vomiting, self-induced vomiting, bulimia.</td>
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<td></td>
<td>Chronic active hepatitis, hypo- and hyperthyroidism, glomerulonephritis, heavy postnasal drip, heavy metal poisoning.</td>
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Problems of swallowing

• 1. determination the nature of dysphagia: difficulty in swallowing liquids, solids or both. Careful oropharyngeal examination is needed
• 2. oesophageal (barium or with water soluble contrast media) X-ray studies
• 3. oesophagoscopy: to obtain biopsy specimen from a lesion causing filling defect on X-Ray, the diagnosis of peptic oesophagitis or Barett’s oesophagus are based only on endoscopy; sclerotherapy of oesophageal and gastric varicies could be performed exclusively by this tool
Oesophagus malformation shown by barium contrast
ABDOMINAL PAIN

• Acute /chronic
• Characterization: sharp, cramping, burning
• Intensity: acceptable-intolerable
• Localization: upper/lower; localized/diffuse, radiating
• Relationship to meals: on fasting, while eating, shortly after/or 30-90 min later
Common causes of abdominal pain

- **Gastrointestinal causes:** Acute and chronic cholecystitis, Appendicitis, bowel obstruction, constipation, diverticular disease, gastroenteritis, IBD, irritable bowel, pancreatitis, peptic ulcer and reflux disease, tumours

- **Extraintestinal causes:** Abdominal aortic aneurysm, Dysmenorrhea, Epididymitis, Incomplete abortion, Nephrolithiasis, Ovarian cyst, Pelvic inflammatory disease, Pregnancy, UTI, Pb intoxication, Porphyria
Alteration in bowel habit

- Diarrhoea and/or constipation: consider intestinal or extraintestinal cause
- Evaluate with the related symptoms (weight loss, fever, bloating....)
- Stool: determination of frequency, consistency, colour, if any blood is present, presence of mucus and pus,
- Nocturnal diarrhoea consider always as organic
Factors and disorders associated with constipation

- **General**: lack of physical activity (eg. hospitalization), not enough fiber and fluid intake
- **Systemic**: side effect of drugs (antacids, analgesics, psychopharmacologic agents, iron), Endocrine disorders (hypothyroidism, hyperparathyroidism), reflexory in nephrolithiasis, and in pancreatitis
  Metabolic disorders (hyper Ca, uraemia, hypoK)
- **Colonic**: Obstruction, IBS, Diverticular disease, Painful anorectal disorders
- **Neurogenic**: Hirschprung’s disease, CNS disorders, Diabetic neuropathy, Psychogenic cause
Common causes of diarrhoea

Infection: viral, bacterial, parasite infestation (e.g. amoeba)

Diet, food and lactose intolerance, much alcohol, reaction to certain medications or laxative abuse.

**GI diseases that cause diarrhoea**
- Crohn's disease, ulcerative colitis, irritable bowel syndrome, gastrointestinal tumours, and malabsorption syndromes such as coeliac disease.
- Extraintestinal diseases: hyperthyroidism, functional- psychogenic, systemic mastocytosis
Physical examination 1.

- **Inspection**: colour: paleness or jaundice, nutritional condition, contour: enourmously large masses, ascites, fistulas in the perianal region, forced movement of the bowel may be seen

- **Auscultation**: absence of bowel sounds in evolving ileus or an obstructing process, or succussion splash-in gastric outlet obstruction
Physical examination 2.

- **Palpation**: detecting tenderness and masses

  Rebound tenderness (direct or referred) after removal of the examining hand is a clue to localized or generalized peritonitis, abdominal emergencies.

  Rectal digital examination: masses intrinsic to the rectum, abnormalities in the pelvis might result palpational finding on the punch of the Douglas, presence or absence of fresh bright red bloody or maroon stool.

- **Percussion**: to assess: free air beneath the diaphragm; liver and spleen size; retention in the urinary bladder
Laboratory tests

- Total blood count, ESR, liver enzymes, bilirubin, amylase-lipase
- Tumour-markers (CEA, α FP, CA19.9)
- For malabsorption: stool fat painted by sudan, starch by iodine reaction, muscle remnants by light microscopic evaluation
- D-xylose absorption test to separate mucosal disease from pancreatic insufficiency
- For Lactose intolerance: Hydrogen breath test
- For Helicobacter Pylori: 13Carbon urea breath test
Ultrasound (US)+doppler

- Usefull in delineation of abdominal masses
- To determine wall thickness (stomach…)
- To find stones and backward dilatation of ducts (bile, and ureter, pyelon) and cysts of the pancreas and the kidney
- To determine TNM stadium of tumours
- To assess blood flow in deep veins
- To find and monitor aortic aneurysma
- For monitoring and follow up (cure/relaps) in oncohaematology
- Help in performing US guided needle biopsies
ENDOSCOPY

• THIS PROCEDURE ALLOWS FOR DIRECT INSPECTION OF THE MUCOSA AND THE LESION ITSELF

• Permit to identify and differentiate between peptic and neoplastic ulcerating lesions; to find the bleeding site and to perform cauterization

• PERMITTING DETECTION OF: -CANCERS AND POLYPS (that may be missed by barium X-ray studies),- inflammatory changes of the mucosa,

• to diagnose HP, performing biopsies and polypectomy
Endoscopy (flexible fiberoptic instrument) forms

- Oesophago-gastro-duodenoscopy
- Colonoscopy
- Sigmoidoscopy (rigid): for identifying the lower 25 cm of the colon
- Recto-anoscopy (rigid)
- ERCP
- Selective CT enterography, MRI
- Capsullar video endoscopy

Radiologic (X-ray) examination may be only preferred when there are contraindications to safe endoscopy
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<th>Absolute Contraindications</th>
<th>Relative Contraindications</th>
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<td>Patients with large Zenker's diverticulum</td>
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<td>Patients who are moribund</td>
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<td>Patients with suspected perforated viscus</td>
<td>Dysphagic patient who has not had an esophagogram recently</td>
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<td>Patients who are hemodynamically unstable</td>
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**Absolute Contraindications**
- Patients who are unable to cooperate
- Patients who are moribund
- Patients with suspected perforated viscus
- Patients who are hemodynamically unstable

**Relative Contraindications**
- Patients with large Zenker's diverticulum
- Dysphagic patient who has not had an esophagogram recently
Upper gastrointestinal endoscopy: permits evaluation of the esophagus, stomach, duodenum; ERCP: permits inspection and canulation of the papilla Vateri, and visualise the architecture of pancreas, ductal dilatations, the branching of the bile ducts, to perform papillotomy and stent implantation.

Colonoscopy: visualises the entire colon, the terminal ileum and the colonic polyps can be removed, biopsy might be performed from lesions for histological evaluation.
Indications for endoscopy of the esophagus

**Diagnostic**
Dysphagia and odynophagia, suspected gastroesophageal reflux disease

Cancer surveillance (*eg*, Barrett's esophagus)

Abnormal results of barium esophagogram

**Therapeutic**
Dilatation of strictures, both benign and malignant

Sclerotherapy and banding of varices

Stent placement in palliative therapy of malignant stricture

Laser therapy of esophageal and gastroesophageal malignancies

Removal of foreign body
colonoscopy
X-ray studies

- First choice for determining free air (sign of perforated viscus) on plain film
- First choice to confirm ileus (nivous in the small or large intestine) on plain film
- Best in assessing motility and alterations of small intestine relatively inaccessible to fiberoptic instruments.
- When endoscopy is contraindicated: severe ulcerative colitis: barium enema with air contrast techniques,
- For visualisation of fistulas
- With absorbeable contrast media: to find cause of recurrent pneumonias and aspiration
Chron’s disease. Barium enema
Other tools for visualization

- CT, MRI: TNM staging
- PET (positron emission tomography) in case of question
- Promt mesenteric angiography: in suspicion of vascular disease: mesenteric ischaemia and bleeding from the small intestine
- Isotope scan
Case presentation of a 21yrs old ♂
The only symptome is fever
38 C for 3 months

- Physical examinaton: normal
- abd. US normal
- CRP: 27,58, ESR: 22 mm/h
- Sources of infection by ORL consultation were disclosed
- Thyroid function, immun panel tests: negative
- viral serology: CMV, EBV IgG positive
- Echocardiography: normal,
- After a month thorough follow up he said that he missed to tell that he found the stool bloody- he did not think that it might be imnportant( psychosomatic alteration is to be suspected)
- Panendoscopy: duodenal ulcer
- Repeated US ( 2 months apart) revelaed inhomogenity in the spleen, therefore
- Abdominal CT had been performed before colonoscopy: the ileum seemed to be tickened by this method:
Selectiv enterography revealed Chron’s disease.
Rectal bleeding

Sigmoidoscopy

Local bleeding with lesion

Manage lesion

Blood above reach of scope, melena, or no lesion seen

NG aspirate

active lower GI bleeding

not actively bleeding

Nuclear scan

Colonoscopy

Upper endoscopy

Angiography

Consider:
Small bowel series
Nuclear scan
Angiography
Meckel's scan
Upper endoscopy
Laparotomy

Treat

Treat
Izotop-tagged red blood cell
Case presentation

Complain: melaena

Gastroscopy: negative

Colonoscopy: negative, but from the coecum (valv Bauchin) black stool appeared meaning that the bleeding is originated from the small bowel
Szelektív angiográfia:

This is a positive finding

But, in the present case extravasation was not seen
In the first part of the jejunum appr. 10-12 cm long pathological vessel structure was seen in the arterial phase. AV malformation? Therefore capsular enterographia had been indicated. According to that result the patient was operated.
angiodysplasia
Reasons of small bowel bleeding are

Angiodysplasia and arterial malformation (30-40%),

Others less frequently:

NSAID enteropathy, Erosive jejunitis-ileitis, Diverticular (Meckel), Crohn’s disease, Intussusception, tumors: leiomyoma, carcinoid, lymphoma, adenocarcinoma, Ischaemic enteropathy, Aortoenteral fistula
50% the bleeding source remain unknown after the upper and lower ract endoscopy had been performed. Push – enteroscopy or capsular endoscopy is indicated in these cases when others, like CT - MR enterography, radioizotop scan and angiography failed to find the bleeding source. After thorough examination still 5% of bleedings remain obscure.
JEJUNUM ANGIODYSPLASIA

Seen on capsullar enterography
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Functional</th>
<th>Neoplastic</th>
<th>Inflammatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>None</td>
<td>Common</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>Daytime only</td>
<td>Nocturnal</td>
<td>Day and night</td>
</tr>
<tr>
<td>Blood loss</td>
<td>None</td>
<td>Frequent</td>
<td>Frequent</td>
</tr>
<tr>
<td>Fever</td>
<td>None</td>
<td>Rare</td>
<td>Frequent</td>
</tr>
<tr>
<td>Pain</td>
<td>Cramping, relieved by defecation</td>
<td>Minor to severe</td>
<td>May be localized; may be severe</td>
</tr>
<tr>
<td>Bowel habit (diarrhea or constipation)</td>
<td>Alternating diarrhea/ constipation</td>
<td>Constipation (rarely diarrhea)</td>
<td>Diarrhea or normal</td>
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<tr>
<td>Laboratory tests</td>
<td></td>
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<tr>
<td>Hematocrit</td>
<td>Normal</td>
<td>Often decreased</td>
<td>May be decreased</td>
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<tr>
<td>White blood cell count</td>
<td>Normal</td>
<td>Usually normal</td>
<td>Often elevated</td>
</tr>
<tr>
<td>Erythrocyte sedimentation rate</td>
<td>Normal</td>
<td>Usually increased</td>
<td>Usually increased</td>
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