Lecture 14
Pathology and Clinical Science 1 (BIOC211)
Department of Bioscience

Text Reference:
Session Learning Objectives

This session aims to

- Understand the aetiology, pathophysiology, investigations and management for:
  - Diverticulosis
  - Constipation and problems with defecation
  - Anorectal disorders like Haemorrhoids and Anal fissure
  - Tumours of the digestive system
    - Oral cancer
    - Gastric tumours
    - Pancreatic cancer
    - Tumours of the small intestine
    - Tumours of the colon and rectum
BE HEARD.

The SES may be waiting in your inbox. The survey is open from August 3rd to September 5th. Fill it out for a chance at winning $1000* and help us improve higher education.

The sooner you complete it, the more chances you have to win!

DIVERTICULOSIS

Acquired and are most common in the sigmoid and descending colon of middle aged people
Asymptomatic diverticula >50% of people >70yrs old

Aetiology
- Low fibre diet
- High intracolic pressure to move small volume stools
- Leads to herniation of mucosa between taeniae coli

Pathology
- Protrusion of mucosa covered by peritoneum
- Obstruction of diverticuli by faeces = diverticulitis

Clinical Features
- Asymptomatic
- Diverticulitis → local tenderness, palpable mass, diarrhoea, rectal bleeding, fever
DIVERTICULAR DISEASE

- Sac-like diverticular of colon - protrusion of mucosa and sub-mucosa through the muscle wall. One has perforated

http://www.gastrohep.com/images_pdf/images/medium/pdevitt140.jpg
DIVERTICULOSIS

BARRIUM XRAY

MRI SCAN

http://images.radiopaedia.org/images/24795/20daabdf6c6b3cb1db9a2723955.jpg

http://curezone.com/upload/_N_Forums/Natural_Heali/diverticulosis.gi
DIVERTICULAR INSITU

http://www.tajpharma.com/Diseases_D/diverticulosis_autopsy.jpg
DIVERTICULITIS – Very inflamed

## DIVERTICULOSIS

### Investigations
- Barium enema
- Colonoscopy/sigmoidoscopy
- CT

### Treatment
- General (high fibre diet/ bulking laxatives/ plenty of fluid)
- Medical (antibiotics, bowel rest)
- Immunomodulating agents such as mesalamine and probiotics
- Surgery

### Differential Diagnosis
- Colorectal cancer, IBD, infection

### Complications
- Perforation, fistula, abscess, bleeding, obstruction
CONSTIPATION

Definition
- Infrequent passage of stools, straining >25% of time, passage of hard stools & incomplete evacuation

Causes
- Due to gastrointestinal disorders
  - Dietary – low fibre and fluid intake
  - Motility – slow transit constipation, IBS
  - Structural – carcinoma, diverticular disease
  - Defecation – anorectal disease
- Due to non-gastrointestinal disorders
  - Drugs – opiates, iron supplements, anticholinergics
  - Neurological – MS, hypothyroidism, pregnancy
  - Others – immobility, depression
CONSTIPATION

Assessment and management

- Suspicious symptoms of underlying pathology
- Digital rectal exam
- Proctoscopy/ sigmoidoscopy
- Colonoscopy
- Diet, bulking agents, fluid intake
- Laxatives
HAEMORRHOIDS

- Arise from congestion of the internal and/or external venous plexuses around the anal canal
- Extremely common in adult

**Aetiology**
- Unknown
- Associated with constipation and straining
- Pregnancy
- Portal hypertension
- Cancer rectum blocking the veins
HAEMORRHOIDS

Classification
• First-degree
  o small haemorrhoids that bleed
• Second-degree
  o prolapse from the anus but retract spontaneously
• Third-degree
  o require manual replacement after prolapsing

Clinical features
• Bright red rectal bleeding ( after defecation )
• Pain, pruritus ani and mucous discharge

Investigation
• Diagnose by inspection, rectal examination
• proctoscopy + sigmoidoscopy
HAEMORRHOIDS

- **Treatment**
  - General measures to prevent constipation and straining
  - Injection sclerotherapy
  - Band ligation
  - Haemorrhoidectomy
HAEMORRHOIDS

From Hemorrhoids. Mayo Foundation for Medical Education and Research, by Mayo Clinic Staff

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HAEMORRHOID TREATMENT

Pre-Op

Post-Op


http://www.fresh-hemorrhoids-cure.com/images/Afterhemectomy.jpg
ANAL FISSURE

- Anal mucosal tear, most commonly in midline posteriorly
- Associated with constipation (hard stool tearing anus)
- Can be associated with Crohn’s

Clinical features
- Severe pain + minor bleeding after defecation

Diagnosis = inspection

Treatment
- Avoidance of constipation
- Local anaesthetic cream + bulk laxative
- Surgery
ABSCESS + FISTULA

- Abscess due to infection of anal gland by normal intestinal bacteria
  - Can be associated with Crohn’s disease
  - Spontaneous rupture may lead to fistula

Clinical features
- Extreme perianal pain, fever, discharge of pus

Treatment
- Drain abscess + Antibiotics
- Fistula needs laying open (probe cut-down)
FISTULAS AND FISSURES


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endeavour.edu.au
# TUMOURS OF THE DIGESTIVE SYSTEM

## Oral cancer
- Squamous carcinoma, incidence increased

### Risk factors
- Poor diet
- Alcohol excess
- Smoking or tobacco chewing

### Clinical features
- Solitary ulcer
- Solitary white patch (leukoplakia) / red patch
- Fixed lump
EARLY INVASIVE ORAL CANCER

http://screening.iarc.fr/picoral/B2a00001a.jpg
SQUAMOUS CELL CARCINOMA - TONGUE
LEUKOPLAKIA

Leukoplakia
‘White Patch’
Occasional precursor to oral cancer

INFILTRATING ORAL SSC

TUMOURS OF THE DIGESTIVE SYSTEM

- **Investigation**
  - Biopsy

- **Treatment**
  - Surgery, radiotherapy

- **Prognosis**
  - Mortality rate around 50%
  - Early diagnosis is the key to a good prognosis
  - Bowel screening tests are very beneficial
## OESOPHAGEAL CANCER

<table>
<thead>
<tr>
<th>Adenocarcinoma or squamous cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Epidemiology</strong></td>
</tr>
<tr>
<td>- Squamous cancer rare in western population, common in China</td>
</tr>
<tr>
<td>- Incidence of adenocarcinoma in UK is rising (Due to high prevalence of GORD and Barrett’s oesophagus)</td>
</tr>
<tr>
<td><strong>Risk factors</strong></td>
</tr>
<tr>
<td>- Tobacco smoking, high alcohol intake, achalasia</td>
</tr>
<tr>
<td><strong>Clinical Features</strong></td>
</tr>
<tr>
<td>- Key feature = dysphagia (progressive)</td>
</tr>
</tbody>
</table>
# OESOPHAGEAL CANCER

<table>
<thead>
<tr>
<th>Investigations</th>
<th>Endoscopy with cytology and biopsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment:</td>
<td>Surgery</td>
</tr>
<tr>
<td></td>
<td>Radiotherapy</td>
</tr>
<tr>
<td></td>
<td>Chemotherapy</td>
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<tr>
<td></td>
<td>Palliative</td>
</tr>
<tr>
<td>Prognosis:</td>
<td>5 year survival 6-9 %</td>
</tr>
<tr>
<td>Complications</td>
<td>Fistula, stricture, bleeding</td>
</tr>
</tbody>
</table>
OESOPHAGEAL CANCER

http://www.gastrolab.net/ya732b.jpg
OESOPHAGEAL CANCER

Barium Xray

http://www.endoskopischer-atlas.de/o043.jpg
SQUAMOUS CELL CARCINOMA
OESOPHAGUS

http://radiology.uchc.edu/eatlas/images/GI/5318b.gif
STOMACH CANCER

○ Epidemiology
  • leading cause of cancer deaths worldwide
  • Extremely common in China, Japan and parts of South America
  • Uncommon in USA, less common in UK
  • men > women
  • Incidences rises after 50 years of age

○ Pathology
  • adenocarcinoma (mucus secreting cells in base of gastric crypts)
  • 50% in antrum, 20-30% in body, 20% in cardia
  • polypoid, ulcerating, fungating or diffuse
STOMACH CANCER

- **Causes:**
  - H. Pylori (early age of infection) → chronic gastritis
  - greatest risk with decreased or no acid production
  - Diet - nitrite/nitrates, salted, smoked or pickled food

- **Clinical Features:**
  - Asymptomatic early
  - Weight loss, anorexia and nausea
  - Epigastric pain (ulcer-like)

- **Investigations**
  - Endoscopy, cytology, biopsy
  - Aim is to stage and determine suitability for resection
STOMACH CANCER


http://i.ytimg.com/vi/__b_nj5yCHJE/0.jpg
## STOMACH CANCER

### Treatment:
- Surgery is best option if operable (80-90% in early Ca)
- Chemotherapy
- Palliative

### Prognosis & Natural Progression:
- Very poor (<30% 5yr survival)
- Most present late with advanced disease

### Differential Diagnosis
- Peptic ulcer, GORD
STOMACH CANCER

http://radiographics.rsna.org/content/31/1/189/F15.large.jpg
STOMACH CANCER - GRADING

# OTHER GASTRIC TUMORS

- Stromal tumours
  - Leiomyomas or leiomyosarcomas
- Primary lymphoma
- Gastric polyps

[Leiomyoma](http://www.gastrolab.net/y0063.jpg)

[Stromal tumours](http://www.sciencephoto.com/image/261037/530wm/M2400629-Gastric_polyps-SPL.jpg)

[Primary lymphoma](http://www.gastrolab.net/y0063.jpg)

[Gastric polyps](http://www.sciencephoto.com/image/261037/530wm/M2400629-Gastric_polyps-SPL.jpg)
# PANCREATIC CARCINOMA

**Epidemiology:**
- 10-15/100000 in western population (incidence increases in those above the age of 70)
- Men > women

**Pathology:**
- Adenocarcinoma

**Causes:**
- Unclear (smoking, chronic pancreatitis, diabetes, genetic)

**Clinical Features:**
- Pain
- Weight loss
- Obstructive jaundice (Ca head)
# PANCREATIC CARCINOMA

**Investigations:**
- CT Scan
- Laparoscopic ultrasound
- Guided cytology and biopsy

**Treatment:**
- Surgery (20%)
- Mostly palliative

**Prognosis:**
- Very poor
- Overall 5 year survival rate - 4%
FIGURE 15-7
Carcinoma of the pancreas. (A) An autopsy specimen shows a large tumor in the tail of the pancreas (arrow) and extensive metastases in the liver. (B) A section of the tumor reveals malignant glands embedded in a dense fibrous stroma. A nerve (left) shows peripheral invasion.

BILIARY TRACT INVOLVEMENT

http://library.thinkquest.org/08aug/00436/jaundice.jpg
TUMOURS OF THE SMALL INTESTINE

- Small intestine is rarely affected by neoplasia.
- Most common benign tumour is adenoma and usually asymptomatic.
- Malignant tumour is rare and most common is adenocarcinoma. Majority occurs in middle age or later. Treatment is by surgical resection.
## TUMOURS OF THE COLON AND RECTUM

<table>
<thead>
<tr>
<th>Polyps</th>
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<tbody>
<tr>
<td>• Polyps may be neoplastic or non-neoplastic</td>
</tr>
<tr>
<td>• Single or multiple</td>
</tr>
</tbody>
</table>

- **Risk factors for malignant change**
  - Large size, multiple polyps, dysplasia
  - Nearly all forms of colorectal carcinomas develop from adenomatous polyps (5-10 years)

- **Clinical features**
  - Asymptomatic and discovered incidentally (endoscopy)
  - Bleeding, anaemia
COLORECTAL CANCER

Epidemiology
- 2nd most common cause of cancer death in western countries
- Incidence increases with age
- Rare in developing world

Aetiology
- Environmental factors (80% sporadic cancers)
  - Diet (low fibre, high animal fat)
  - Non dietary (colorectal adenomas, IBD)
- Genetic factors
  - Hereditary Non-polyposis Colorectal Cancer (HNPCC)
  - Familial Adenomatous Polyposis (FAP)
COLORECTAL CANCER

○ Pathophysiology
  • stepwise progression from normal mucosa to adenoma to cancer

○ Clinical Features
  • Depends on site
  • Rectal bleeding
  • Obstruction
  • Anaemia from occult bleeding
  • Colicky lower abdominal pain

○ Investigations:
  • Faecal occult blood screen
  • Colonoscopy and biopsy
  • CT, pelvic MRI
COLORECTAL CANCER

Treatment
- Surgery
- Radiotherapy + Chemo
- Prevention/screening

Prognosis
- Depends on staging

Differential Diagnosis
- As by main symptoms

Complications
- Colostomy
- Obstruction
- Bleeding

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http://trialx.com/curetalk/wp-content/blogs.dir/7/files/2011/05/diseases/Colostomy-1.jpg
COLON CHANGES

(A) Normal Colon
(B) Benign
(C) Well differentiated neoplasm
(D) Poorly differentiated neoplasm
(E) Anaplastic malignant neoplasia
(F) Benign neoplasia

Readings and Resources

Resources:

- **Set Textbooks:**

- **Additional textbooks:**
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