Diverticular Disease

- Solitary Caecal Diverticulum
- Left Sided Diverticular Disease
- Right Sided Diverticular Disease
- Pan Colonic (Total) Diverticular Disease
Diverticular Disease

?Normal

DIVERTICULOSIS
Presentation --- Acute

Right
- Bleeding
- RIF Pain
  - Peritonitis
  - Phlegmon
  - Abscess

Left
- LIF Pain
  - Obstruction
  - Phlegmon
  - Peritonitis
  - Abscess
- Bleeding
Presentation ---Chronic

Right
• Anaemia

Left
• Anaemia
• Constipation
• Pain
• Fistulation
Diverticular disease - uncomplicated
Diverticular disease - pericolic abscess
Solitary Caecal Diverticulum

- 1 in 1000 emergency laparotomies
- First recorded: 1912 Potier
  - 52% anterior
  - 15% posterior
  - 14% lateral wall
  - 7% medially (Wagner and Zollinger 1961)
- “True” diverticula (muscle fibres in wall)
  - Parker and Seargent 1957
  - Anscombe 1967
- Congenital
- Only present with complication
Classification at Operation
Greaney and Snyder 1957 Am J. Surg

- Grade I and II
  - Inflammation of diverticulum or DD Mass

- Grade III and IV
  - Pus or perforation
## Diverticular Disease Worldwide

<table>
<thead>
<tr>
<th>Country</th>
<th>Studies</th>
<th>n</th>
<th>Caecum Colon</th>
<th>Ascending Colon</th>
<th>Transverse Colon</th>
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<th>Sigmoid Colon</th>
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# World Distribution of DD

<table>
<thead>
<tr>
<th>RIGHT SIDE</th>
<th>LEFT SIDE</th>
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<tr>
<td>Japan</td>
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<td>Korea</td>
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<td>Taiwan</td>
<td>Australia</td>
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<tr>
<td>Tailand</td>
<td>India</td>
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</table>
Mechanism of Left sided DD

- Abnormal thickening with ageing
- Collagen abnormality
- Increased intraluminal pressure
- Segmentation
Mechanism of Left sided DD

- Mucosa and submucosa herniate
- Locus minoris resistentia
Ageing and Diet

- Uncommon under 40
- 60% over 70 have DD
- Environment of the colon rather than its age (Painter and Burkitt 1975)
- Fibre
  - 43881 USA males
  - Fibre associated with marked decrease risk of symptomatic DD
- Meat
  - 3105 colonoscopies with dietary interviews
  - Right sided diverticulosis correlates with past meat consumption
Mechanism of Right Sided DD

Japan

- Large increase in detection
  - 1950’s.....1%
  - 1970’s.....20%

- Younger age

- Decrease in fibre
  - 1946.....25.0g/day
  - 1991.....14.5g/day
Correlation with dietary fibre intake

Fig. 1 There is a negative correlation between dietary fiber intake and the incidence of colonic diverticulosis in five regions in Japan [102]
Site of Involvement by Age Group
YoshidaY, Inoue M
Birth cohort analysis Hirosaki University Hospital

- 1945-54
- 1935-44
- 1915-24
- 1905-14

Graphs showing detection rates for right-sided, left-sided, and bilateral types over age ranges.
Intraluminal Pressure Right DD

Colonoscopy with catheter tip transducer
- 13 R sided DD
- 10 Normal
- Injection of neostigmine more frequent high pressure waves
- Higher motility index
  Sugihara K et al Gut 1983

Ascending colon pressure higher with right sided DD than sigmoid DD
  Sasaki et al. Nankodo, Tokyo 1990

Intraluminal pressure higher in right colon in patients with right sided DD than those without diverticula
Pathological Features Right Sided DD

- Almost all are pseudodiverticula
- Abnormal thickness of colon wall
- Number of haustra per constant distance of ascending colon is greater than controls
- Abnormal shortening of colon
- Right sided DD are at points where artery penetrates colon wall
Detection rates of DD in Hawaiian Japanese and Mainland Japanese

Nakaji, Danjo et al. In J Colorectal Dis 2002

\[ \sum \text{ vs } \Omega \]

“Omicroid Colon”
Clinical Behavior of Left Sided DD

Infective Complications
- Diverticulitis
- Diverticular Phlegmon
- Diverticular Abscess
- Diverticular Perforation
Clinical Behavior of Left Sided DD

Other Complications

• Fistulation
  – Bladder
  – Vagina
Clinical Behavior of Left Sided DD

Other Complications

- Stricture formation
- Obstruction
- Bleeding
Clinical Behavior of Right Sided DD

Singapore General Hospital
Wong, Soong-Kuan et al. DCR 1997

• 188 Patients
• Mean Age 65.1 (SEM 13.9)
• Women presented 8.4 years later than men
• Right sided DD 42%
• Left sided DD 34%
• Pan colonic DD 24%
Clinical Behavior of Right Sided DD

Massive Rectal Bleeding (n=85)
- Right sided DD 49.4%
- Left sided DD 16.5%
- R + L DD 34.1%

Surgery for bleeding
- Right sided DD 41%
- Left sided DD 7%
Clinical Behavior of Right Sided DD

Diverticulitis (n=65)
- Right sided DD 38.5%
- Left sided DD 49.2%
- R + L DD 12.3%

Surgery more common for left sided diverticulitis

Fistulation, rare, but predominantly left sided DD
Clinical Behavior of Right Sided DD Obstruction (n=21)

- Right sided DD 38.1%
- L sided DD 42.9%
- R + L DD 19%
Management of Diverticulosis

Right Side
• ? Fibre
• Laparoscopic resection
  Right hemicolecotomy

Left Side
• Fibre and advice
• Laparoscopic resection
  Left Hemicolecotomy
Management of Diverticulitis

Right Side
- Often get surgery as mimic appendicitis unless CT
- If known conservative
  - Drip
  - Suck
  - Antibiotics
  - Monitor
Failure of conservative Rx leads to surgery
Right Hemicolecotomy

Left Side
- Conservative
  - Drip
  - Suck
  - Antibiotics
  - Monitor
- CT drain abscess
Failure of conservative Rx leads to surgery
Hartmanns
Anterior resection
Management of Diverticular Bleeding

- Resuscitation
- Assessment
- Angiography
- Right Hemicolectomy
- Left Hemicolectomy

IF IN DOUBT
TAKE IT ALL OUT

- Sub Total Colectomy and Ileostomy
Caecal Mass/ Sigmoid Phlegmon

Conservative treatment
Unless
• Rising pulse
• Worsening sepsis
• Increasing pain
• Generalised tenderness
• Exclude cancer
? Interval laparoscopic resection
## Different Entities?

<table>
<thead>
<tr>
<th></th>
<th>Left Sided</th>
<th>Right Sided</th>
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<tbody>
<tr>
<td>Genetics</td>
<td>Acquired</td>
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<tr>
<td>Age</td>
<td>Old</td>
<td>Young</td>
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<tr>
<td>Muscle Abnormality</td>
<td>Remarkable</td>
<td>Absent</td>
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<tr>
<td>Intraluminal Pressure</td>
<td>Abnormally high</td>
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<tr>
<td>Inflammatory Complication</td>
<td>Common</td>
<td>Unusual</td>
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<tr>
<td>Bleeding</td>
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