Pattison Prize in Clinical Surgery

1965

An entry by Tom W. Balfour
The following six patients were studied by me while I was conducting a Pilot Survey into the natural history of Diverticular Disease of the Colon. This survey was carried out at the Western General Hospital, Edinburgh, during the Summer of 1964 while I was the holder of a Gunning Vacation Bursary, tenable in the Department of Surgery. Accordingly I am grateful to the surgeons of the Western General Hospital for allowing me access to their patients; and to Sir John Bruce and Mr. C.W.A. Falconer for their personal encouragement during this project.

The patients whom I have selected are not intended to paint the general picture of diverticular disease as it is found within the community at large - they are chosen rather to provide illustrations at the extreme surgical end of the spectrum of this disease. Such an approach seemed justifiable since, while it still remains true that 70% of patients with diverticular disease will be maintained in good health by simple medical measures, the pendulum of clinical opinion is swinging rapidly towards earlier surgical intervention in the remaining 30% of patients.
The "Discussion" on the patients will not be completed in the manner which is conventional at the Finals Examination where great emphasis must be placed upon "Differential Diagnosis" and "Prognosis" for each patient. This variation in technique was considered advisable since in all six patients the diagnosis had been established with certainty - indeed, in 3 cases I personally had the opportunity to examine the resected colon - and it appeared to me that retrospective analysis of the presenting features for the sole purpose of fabricating an extensive differential diagnosis would be both futile and dishonest. Furthermore, the 3 patients who had not died during their initial hospital admission had been studied by me in the "Follow-up Pilot Survey", so that the general prognosis was already known.

In my discussion, wherever apparently dogmatic statements are made, without bibliographical reference, in relation to various parameters of diverticular disease, they will invariably have been drawn from the results of the Survey carried out at the Department of Surgery of the Western General Hospital.
A Case of Sub-Acute Obstruction from a Peri-Colic Abscess

Mrs. Anne Montgomery,  
Main Street,  
Davidson’s Mains.  

Age 62 (28/9/99)  
Married  
Housewife  
(Dr. Skinner - Whithburn.)

Admitted as Emergency.

Complaints  
Lower Abdominal Pain  
Diarrhoea  
Anorexia  
Flatulence  

2 months  
many years.

History of P.C.  
This patient last felt really well 12 years ago. Since then her bowel habit has been very irregular, a few weeks of diarrhoea alternating with constipation.

Two months ago she was confined to bed with a "heavy cold" accompanied by colicky lower abdominal pain, and intermittent diarrhoea — 5 to 6 poorly formed stools per day.

normal in colour.

no blood, pus, mucus.

no tenesmus.

Over the past 5 days her abdominal pain has become more severe, in association with some distension, and her stools
have become more liquid in consistency and more foul-smelling.

Her appetite has been very poor, and for two months she has been "afraid to eat", believing that food tended to precipitate her diarrhoea.

Mrs. Montgomery has always been overweight, but thinks that she may have "lost a little" in the past few months.

**Systematic Enquiry**

**C.V.S.**
No breathlessness, palpitations, chest pain, ankle swelling.

**R.S.**
No cough or sputum.

**G.U.S.**
Nocturia x 2 for 10 yrs. No polydipsia.
No frequency, dysuria, haematuria.
No gynaec. complaints. (Menopause at age 51)

**C.N.S.**
Good memory and concentration.
Spectacles worn for many years. No recent change.
No fits, "black-outs", paralyses.

**L.S.**
No joint swellings. No bone pain.

**Skin**
No rashes. No ecchymoses.

**Past History**
Childhood exanthemata, including S.F. aged 12.

1924 - "" - Inguinal hernia. Surgical correction.
1953 - R.I.E. - Division of old adhesions.
1960? -
Social History  
Seems to have happy home-life in ground floor flat with husband (rtld. bowling-green keeper) and daughter (bank clerkess).

Manages her own housework.
No tobacco. No alcohol.

Family History
M. - d. 65 - C.V.A.
Ff - d. 45 - cause not known.

Sibs. 5 % 7 a. e.w.
4 % 2 a. e.w.  
Patient is oldest of 10 children.
No evidence of bowel disease.

H - 68 a. e.w.
2 daughters - a. e.w.

Physical Examination
Well-hydrated obese female in no acute distress.
Mucous membranes well injected. No cyanosis; no jaundice.
No finger clubbing; no sup. lymphadenopathy.
Breasts and thyroid gland seem normal. No oedema.

Temp. = 98° F.
Wt. = 11st. 2 1/2 lbs.

Wave form normal.
Vessel wall not palpable.
R = L Synchronous in time, equal in force.
B.P. = 140/85 mm. Hg. J.V.P. not raised.

A.B. was impalpable. No thrills.

H.S. = I and II normal in all areas. No murmurs.

No evidence of central or peripheral failure.

Peripheral pulses equal R= L and of good volume.

Respiratory System:

No cough. No dyspnoea.

Chest symmetrical. Moves well.

Trachea central. No enlarged cervical lymph nodes.

Expansion good bilaterally.

V.F. = V.F.

P.N. = P.N. Resonant. Normal cardiac dullness.

B.S. = B.S. Vesicular. No accompaniments.

Good air entry in all areas.

Vocal fremitus was not increased.

Abdominal System:

Edentulous. Breath, tongue, and fauces were clean and without visible abnormality.

Abdomen was very obese, showed multiple old scars, but moved freely with respiration.

Tender to moderate palpation.

No guarding. No specific mass.
Liver, spleen, and kidneys were not palpably enlarged. No splashing was elicited.

Bowel sounds were diffusely increased over the lower abdomen - they were not 'tinkling' in quality.

No vascular bruit was detected.

The hernial orifices were not abnormally patent. The inguinal lymph nodes were neither enlarged nor tender.

P.R. - External haemorrhoids were present but did not bleed. The sphincter relaxed with difficulty.

An irregular, non-tender mass seemed to bulge into the rectum from the left pelvis.

Dark melaena stool was withdrawn on the examining finger and reacted positively for blood.

Central Nervous System:

Patient was attentive and well orientated. Speech and memory seemed unimpaired.

No nuchal rigidity. Carotid pulsations equal. No bruits.

The cranial nerves were intact. The fundi were normal.

Muscle power, tone and coordination were normal and equal on both sides.

Sensation, superficial and deep, was normal.

Reflexes - @ B T K A Abdl. Plantar

++ + + + + +
**Investigations**

**Blood** - Hb = 81%, E.S.R. = 32mm, W.B.C. = 8,500

**Urine** - S. Gravity = 1015, No abnormal constituents, No growth on culture

**Biochemistry**, liver Function Tests, and Plasma Proteins were all within normal limits.

**Prothrombin time** = 51% of control

**X-Ray of Chest**

*Abdomen* showed no abnormality

**Stool** occult blood was repeatedly positive (++)

*Culture* produced no organisms of dysentery or enteric group

**Sigmoidoscopy** The instrument passed easily to 15cms.

The mucosa was injected but did not bleed.

No ulceration was evident.

**Ba Enema**

A large filling defect in the colon in the L.I.F. was "suggestive of carcinoma" or of local abscess formation. Diverticula were present in the pelvic colon.
Operation:

Left hemi-colectomy + anastomosis. Caecostomy.

Surgeon = Mr. A.A. Gunn.
Incision = Pk. paramedian. Rectus displaced.
Findings =
   1. Many adhesions to old scars.
   2. Inflamed sigmoid colon partially adherent to bladder and uterus.
   3. Liver and glands seem normal.

Summary of Procedure

Adhesions were divided.
Pelvic colon was freed; descending and transverse colon was mobilised.

Left hemi-colectomy with anastomosis.
Small portex tube inserted through stab incision 10 cm. proximal to anastomosis and held by two purse string sutures.
Caecostomy with DE PEZZER catheter introduced through R.I.F. stab.
Wound closed in layers.

Progress

Chest Abdomen } inspected. Required catheterisation.
Day 2: Good urine output
Abdomen - occasional bowel sound heard on auscultation.

Day 3: Patient tolerating 60 ml 1 hr. per exam.
Naso-gastric tube removed. 1-V infusion ceased.

Day 11: Cecostomy tube out.
Sutures out and wound healing well.

Day 14: Wound infection with pus draining intermittently.
Swab was taken for culture and antibiotic sensitivities.

Day 27: Wound clean and dry after 12 day course of antibiotic.

Day 33: Cecostomy wound healed well.
Bowel functioniing well.
Patient has no complaints.
Discharged home.

Summary: Sub-acute obstruction of the large bowel in a healthy 62 year old female was treated by primary excision of a per-iclec abscess with end-to-end anastomosis. The result was excellent.
Inoperable Carcinoma of the Colon with coincidental Diverticulosis.

Miss Margaret Hunter,
'Bellevue',
Whitburn.
Age 72 Housewife.
( Dr. Brown, Whitburn.)

Presenting Complaints:

Colicky lower abdominal pain?
Constipation
Abdominal distension

progressive for 10 days.

Patient was admitted as an emergency.

History of P.C.
The above features had been developing with increasing tempo over the previous ten days, and during this period Miss Hunter had almost nothing to eat or drink.

The patient had been a known diabetic for many years but was normally well controlled on modified diet and PZI. However, for several years she had been virtually house-bound due to progressive bilateral cataracts, peripheral vascular disease and urinary incontinence.

Her appetite had always been poor and she had always required laxatives (- a great variety of proprietary brands-) to relieve her constipation.
She had never experienced rectal bleeding nor melanoma stools. She has no history of vomiting or ulcer dyspepsia. Her weight has been constant over the past few years.

**Systematic Enquiry**

C.V.S. \{ no significant features \}
R.S. \{ were elicited \}
G.U.S. \{ \}

**C.N.S.** - grossly failing vision for 5-6 years. Now almost blind.
No deterioration of memory or concentration.
No syncope, No paralyses nor paraesthesiae.

**L.S.** - Angina eruces after walking 20-30 yards.
No joint swelling.

**Past History:** Normal childhood infections.
No S.F., R.F., T.B.

Diabetic for 12 years. Maturity onset. Well controlled.
10 years ago - R.I.E. - Investigation of vomiting and diarrhoea.
No conclusive diagnosis given. No surgery

**Family History:** M. and F. - both died >70 yrs. Cause not known.
1 Sister - age 68, a.e.w.
Unmarried. No children.

**Social History:** Matriarchal figure who lives with spinster sister.
No financial problems.
Non-smoker. No alcohol.
Physical Examination:

C.V.S.

R.S.

G.U.S.  }

L.S.

Skin

no significant abnormality was found.

The patient was a confused, distressed, obese elderly woman.
She was not clinically dehydrated.

Mucous membranes well-coloured. No cyanosis nor jaundice.
No finger clubbing. No superficial lymphadenopathy.

The thyroid gland and breasts seemed normal.

There was no peripheral oedema.

Temp. = 98.4°F.

Wt. = 11st. 11lb.

Ht. = 5' 0"

B. Pressure = 160/95.

A.S.


Abdomen moderately distended. Tympanitic. No shifting dullness.

No masses, no organomegaly could be detected.

Tenderness to palpation in L.I.F. No guarding.

B.S. increased. Tinkling in quality.

Normal orifices were normal. No enlarged inguinal nodes.

P.R. = Lax sphincter. Rectum empty.

No blood withdrawn on finger.
Patient was confused and disorientated.
The cranial nerves seemed intact. A dense cataract was present in the left lens, and there was a diffuse corneal opacity on the right. The fundi were difficult to visualise but there appeared to be no gross diabetic retinopathy.

Motor function, sensory perception, and reflex activity were difficult to assess in this restless, uncooperative old lady. There was an impression of impaired pain sensation in the lower limbs.

**Investigations**

Blood - Hb = 100%. E.S.R. = 25 mm. W.B.C. = 13,450 (75% polymorphs.)

Biochemistry - was within normal limits.
> Plasma glucose = 153 mg %.

Urine - showed 2% sugar and acetone ++
> (There was no growth on culture.)

X-Ray - of chest was normal.
> of abdomen showed gaseous distension of colon.
> Fluid levels were present in the erect position. The picture was suggestive of obstruction in the sigmoid colon.

E.C.G. - Sinus rhythm. No abnormality.
Operation was carried out on the day of admission before any further investigations had been done:

**Operation** - De-functioning Transverse Colostomy.

- **Surgeon**: Mr. Small
- **Incision**: Upper abdominal mid-line
- **Findings**:
  1. Gross colonic distension due to obstruction of pelvic colon - probably carcinoma (not biopsied).
     No primary lesion was possible.
  2. Small amount of free fluid in peritoneal cavity.

**Procedure**

- Transverse colostomy

Lower 2/3 of wound was closed with strong black silk sutures.

Paul's tubing was inserted and held by purse string sutures.

**Progress**

Progress was fair in the immediate post-operative period. A Barium Enema examination on the 10th day showed a large filling defect, suggestive of carcinoma, in the pelvic colon. Diverticulosis was also present, localised to the pelvic colon, with no evidence of active inflammation.
From the 11th day onwards her diabetic state became very difficult to control, and she developed a refractory infection of wound, skin, and urine. This was actively treated, under bacteriological control, with streptomycin and latterly with chloramphenicol.

Large doses of soluble insulin, and carefully calculated fluid and calorie replacement failed to arrest her deteriorating clinical condition.

On the 32nd, post operative day, diabetic coma supervened and the patient died.

Summary: A case of carcinoma of the colon, which, having produced complete obstruction of the large bowel, was not amenable to any radical surgical procedure. A palliative transverse colostomy was fashioned, but the patient deteriorated and died on the 32nd, post operative day in diabetic coma.
Patient "3"

Diverticulitis with Colo-Vesical Fistula in a healthy Young Man.

Mr. George Henderson,  
Huntingtowerfield Farm,  
by Perth.  

Age 35 (25/6/27)  
Unmarried  
Artificial Inseminator (on the farm.)  
(Dr. Pitkeathly, Perth.)

3/7/52.

Complaints:  
Perineal pain  
- 3 months  
Dysuria and frequency  
- 3 "  
Bubbles of gas in urine  
- 5 weeks  
Haematuria (1 episode only)  
- 4 "

History of P.C.:  
Mr. Henderson was initially seen by his own G.P. some  
3 months prior to admission on account of a recurrent urinary tract  
infection which had failed to subside with a course of antibiotics  
(Tetracycline and then Chloramphenicol). Examination had revealed  
a soft, tender, enlarged prostate gland, and a diagnosis of  
prostatitis was made.

A new development, in the 5 weeks prior to admission,  
had been the passage of bubbles of gas in the urine. After the  
patient finished micturating he was aware of "something still to  
come", and, after waiting a few minutes he was relieved by  
the passage of a few bubbles of "air" per rectum. He had  
ever been aware of passing gravel or a stone.
Four weeks prior to admission, for a period of two days, he had intermittent haematuria in the form of bright red blood intimately admixed with urine. This had not recurred.

Nine months previously Mr. Henderson had been investigated in Perth Royal Infirmary on account of lower abdominal pain which had developed against a background of long standing constipation. Barium studies had revealed "diverticulosis" of the pelvic colon; and a low residue diet with regular use of liquid paraffin had been prescribed advised.

Three months prior to admission, at the time of onset of the urinary symptoms, the patient had lost 10 lbs. in weight over a period of 3-4 wks. It had since remained steady.

He had at no time in the recent past noticed any bleeding per rectum (nor melaena stools), but several years ago he had on one occasion passed fresh blood. Three years ago he had on one occasion passed fresh blood. Three had been no associated pain and his c.p. had attributed this episode to "piles." Investigation had not been pursued and the bleeding had not recurred.

Appetite and general health had been good, and there was no vomiting nor abdominal pain.
Systematic Enquiry into Cardiovascular Respiratory Central Nervous \{ systems revealed \\
Locomotor Endocrine \}

no feature of note. In particular, prior to the episode above, he had never had any frequency, dysuria, nocturia, haematuria, strangury — or tenesmus.

Past History
Childhood exanthemata — no S.F., R.F.
No diabetes, T.B., jaundice.
1946 — Sandfly fever. No residuum evident.
(in Africa.)

Family History
M. \{ both > 60 yrs. \} Alive and well.
F. \}

Sibs. 2B \{ q.e.w. \} No alimentary or urinary disorders.

25. \}

Social History
Enjoys life as artificial inseminator on the farm!
Due to be married in 8 weeks time!
Smokes 10 cigs. per day. "Occasional beer at week-end."

Physical Examination
Healthy-looking young man in no acute distress.
Mucous membranes well coloured. No cyanosis; no jaundice.
No finger clubbing. No superficial lymphadenopathy.
Thyroid gland normal. No oedema.
Pulse = 78/min. Regular
B.P. = 125/85

no significant abnormality was detected.

Mouth, tongue, and teeth were not remarkable. There was no abdominal distension, nor visible peristalsis. The abdomen moved freely with respiration. No tenderness nor guarding was elicited. The abdominal organs seemed of normal size and no abnormal masses were present. Bowel Sounds were active but not increased. There was no vascular bruit.

Nasal orifices were normal. The inguinal lymph nodes were neither enlarged nor tender.

P.R. - The finger was easily introduced and revealed an enlarged, tender prostate with pain radiating to the base of the penis.

No blood, no feces on the examining finger.
Investigations

Blood - 140,100% E.S.R. 15mm. W.B.C. = 5,200.
Electrolytes - within the range of normality.
Urine - a profuse growth of E. coli on culture.
Chest X-Ray - was normal
S.O.B. - repeatedly negative for blood in faeces.

Bar. Enema - 'Diverticulitis' of the pelvic colon. "No fistula was demonstrable."

Bar. F. Thorough - Remains of barium was seen in a few diverticula near the bladder. Gas was present in the bladder. This suggests the presence of a fistulous communication between the colon and the bladder.

Cystoscopy (21 F.) - The bladder capacity was normal. A fistulous opening was seen high up on the left post-nasal wall of the bladder. It was small, firm, vascular, and "not suggestive of malignancy."

Operation
Disruption of Fistula. Resection of Colon. Appendicectomy.

Surgeon Mr. W. Small.
Incision Right para-median.
Findings

1/2" of inflamed colon adherent to dome of bladder.

Procedure

Fistula was disrupted. Segment of colon was resected. Opening in bladder was closed.

The appendix, which was distended by several large faecoliths, was removed as a prophylactic measure.

A fine-bore polythene tube was inserted to the area of colo-colic anastomosis.

Histology - Pulsion diverticula. No evidence of Crohn's disease or Carcinoma.

Progress was satisfactory except for a right basal pneumonia which developed on the 2nd. post-operative day. This responded well to Benzyl Penicillin 1 mega. 6 hourly for 7 days.

4th day - Specimen of faeces sent for bacteriological examination contained no pathogens.

6th day - Patient was passing urine painlessly.

20th day - Patient was discharged home.

Summary

A colo-rectal fistula in a healthy young man with diverticular disease was satisfactorily eradicated by primary radical surgery.
Patient "4"

Bladder-Vesical Fistula, in a patient of Poor General Health.

Mr. John Orr,                        Age 61           Widower.
Kirkland Walk,                       Retired coal miner.
Methil.                              (Dr. Skinner - Buckhaven.)

Admitted as emergency.

Complaints

Frequency of micturition
Pneumaturia
Faeculent urine
Strangury on defaecation

History of Complaints  This patient had retired 7 years prior to admission following injury to his left hip. Since then, his left leg had tended to become swollen and painful when he stood on it for any length of time.

3 months prior to admission Mr. Orr began to develop "pain in his penis" during defaecation, and he noted that his stools had become darker in colour, but never black and tarry. He had never passed frank blood per rectum. At the same time he began to develop frequency of micturition with occasional discomfort while passing water. Furthermore,
his urine had become "dirty brown" in appearance, and he was aware of passing "small bubbles of gas" per rectum when he strained at stool.

There had been no haematuria. His weight had been constant; his appetite poor for many years; and his bowels constipated.

In the few days prior to admission, his frequency had increased to 10/day | Night = Every 1/2 hour / 5-6x.

Systematic Enquiry

C.V.S. 
- Breathless on slightest exertion with constant cough
- and variable sputum - worse in Winter
- No chest pain. No ankle swelling

G.U.S. - There were no features referable to his urinary tract prior to this present illness.

C.N.S.
E.S.
Skin 
- no abnormal features elicited on questioning

Past History
- 8 years prior to admission: — R.I.H. which was not operated on. It has not deteriorated
- 7 years p.t.o. a. — Trauma to left hip. "Thrombosis" of left leg. Not anticoagulated.
6 years p. to admission - Pensioned off his work due to "silicosis + bronchitis."

Never had T.B. to his knowledge.
Never had a surgical operation.

**Family History**
Nil relevant.
No evidence of T.B. or bowel disease in blood relations.

**Social History**
Lives with married daughter in small miner's cottage in Fife.
Seldom out of doors in recent years.
Used to smoke 50 cigs/day. Can now afford only 5-10.
"Bottle of beer and nip of whisky" with son-in-law on pay day.

**Physical Examination**
A well-nourished, previously well-muscled 61 year old man who looked older than his years. He was distressed and dyspneic at rest.

Central cyanosis was evident. His mucosa were well coloured. There was early bilateral finger clubbing. No lymphadenopathy. The thyroid gland was not enlarged. There was no goitred oedema.

\[ HT = 5' 11\frac{1}{2} '' \]
\[ WT = 14\frac{1}{2} st. \]
\[ Temp = 98.8^\circ F. \]
C.V.S.  
Pulse rate = 70/min. Reg. in time and force.
B.P. = 150/85
J.V.P. = 4 cm. above N-S joint. H.S. Reflux +ve.
AB = Tapping in 6th L.I.S. in ant. axillary line.
HS = I and II Soft. No added sounds. No murmur.
Fund = Early 4/10 whirring. No euculates nor haemorrhages

Pariph. Pulses.

R.S.  
Barrel shaped chest. A.P. dium ↑.
Audible wheeze and dry cough.
The Trachea was central.
Expansion was poor bilaterally.
Vocal fremitus was equal.
PN - Hyper-resonant over both lung fields.
BS = BS Vesicular. Poor air entry at both bases.
Coarse expiratory rhachhi were widespread
There were no abnormal vocal sounds.

A.S.  
Edentulous. Mouth and tongue were not remarkable.
The obese abdomen moved well with respiration.

Dilated varicosities which fell from below.

Mobile, non tender mass to the left of midline.
Not like fungus.
Rectal examination was unsatisfactory. The patient was not cooperative, and the anal sphincter was tight.

C.N.S. examination revealed an anxious man who was well-oriented.

All reflexes were brisk and there appeared to be no significant abnormality in motor activity or sensory perception.

Investigations

Blood - Hb 98 % E.S.R. = 16 mm. W.B.C. = 9,300.


Urine - Heavy growth of E. coli on culture.

Chest X-Ray - Changes of pneumoconiosis. Left ventricle slightly enlarged.

Sputum - No acid fast bacilli were seen.

Resp. Fn. Tests - were considered just satisfactory for a lower abdominal operation under general anaesthesia.

S.O.B. - No blood in faeces.

Sigmoidoscopy (Mr. Small) - Reddening of lower rectal mucosa.

No ulceration seen.

Compatible with "diverticulitis."
Ba Enema = Incomplete obstruction in pelvic color.
A few diverticula are present but carcinoma can not be excluded.
There was gas in the bladder, but no fistula was demonstrable.

E.c.g. = Non specific myocardial damage, probably ischaemic.

Cystoscopy = The bladder capacity was reduced to 150 ml.
Faecal stained fluid was obtained by return.
There was a small, granular fistula high up on the base.

Operations = 1 De-functioning Colostomy, which retracted over the ensuing 7 days; therefore to prevent soiling of the peritoneum 2 Transverse Colostomy was carried out.

Surgeon = Mr. Small

Incision = Left lower paramedian.
Findings = Lower pelvic color involved in an inflammatory mass with the fundus of the bladder.
Procedure

Loop of pelvic colon proximal to the inflammatory mass was mobilised and divided between Bayr's clamps; both stomata were exteriorised at lower end of the wound.

Progress was unsatisfactory from the first post-operative day. Attacks of acute paroxysmal dyskinesia were controlled at first by i.v. aminophylline. Wound healing was very unsatisfactory.

On the 13th post-op. day the patient developed pain and tenderness in the right calf. On examination, there was no swelling and no rise in skin temperature, but Homans' sign was positive. Accordingly, a diagnosis of deep venous thrombosis was made, and the patient was treated with anticoagulants and local application of heat.

Wound healing remained virtually absent, although the plasma proteins were not deficient and any wound infection was treated vigorously with antibiotics.

Partial dehiscence of the wound resulted in the
leakage of faeces and urine onto the anterior abdominal wall.

The patient's general condition deteriorated, he became icteric, and died on the 100th post-operative day.

**Summary:**

Diverticulitis of the pelvic colon had given rise to a colo-vesical fistula in a patient whose cardio-pulmonary reserves were grossly impaired.

Palliative surgery was undertaken, but, despite the patient's tremendous will to live, he was unable to cope with the numerous complications which developed.
Patient "S"

Carcinoma of the Caecum with Diverticulitis Coli.

Mrs. Mabel Aitken,  
Fillyside Avenue,  
Edinburgh.  

Age 73 (15/8/89).  
Widow.  
Housewife.  

(Dr. Beckles - Craigentiny)  

22/3/62

Presenting Complaints:

Increasing breathlessness — 4 months
Paroxysmal Nocturnal Dyspnoea — 3 months
Ankle Swelling — 2 months

History of P.C.  This patient had been attending the Cardiac Unit for 2 years, having been referred there by the Rheumatic Unit where she had been treated for rheumatoid arthritis. For 3-4 months prior to this last admission she had become progressively dyspnoeic until she was "breathless after 6 steps on the level." For at least 3 months she had been compelled to sleep propped up in bed, but was still inclined to awaken several times each night "fighting for breath" and...
aware of a tight feeling across the chest.
Both ankles had been swelling, particularly towards the end of each day. She did not suffer from varicose veins.
There had been no true exertional chest pain and no palpitations. There were no symptoms referable to hypertension.
The patient's weight had remained constant, and her appetite had remained poor.

Systematic Enquiry was unrevealing; in particular there had been no nausea, no vomiting, no bowel irregularity, no abdominal pain and no evidence of rectal bleeding.

Past History
No R.F. as a child.
No T.B., nor diabetes.
Rheumatoid arthritis for more than 2 years which was treated with Soluble Aspirin (8 tabs. per diem) and Chloroquine (250 mg. nocte).
No surgical operations. No blood transfusions.

Family History
Parents dead - cause not known.
H. - died aged 68 - C.V.A.
No siblings.
No children.
Social History: A pleasant widow, who, until now this present illness had managed her own housework. Did not smoke nor take alcohol.

On Examination

Temp. = 98°F
Wt. = 85.8 lbs.
Ht. = 5'0"

C.V.S.

B.P. = 180/90
Jugular Venous Pressure was not obviously raised. Apex beat was hearing in the ant. axillary line of the 6th left I.C. space.

Heart Sounds: Soft but normal in all areas. No murmurs.
Fundus: Irregularities of venous calibre. AV nipping.
Gross ankle oedema to mid tibia. Trace of sacral oedema.
Peripheral pulses normal and equal.
R.S.

Trachea was central. No cervical lymphadenopathy.
Expansion was fair bilaterally. Rapid res. rate.
Vocal fremitus normal and equal.
P.N = resonant, but impaired at both bases posteriorly.
B.S = vesicular. Medium egophony at both bases.
No abnormal voice sounds.

No abnormality was found on examination of the alimentary
system and the central nervous system.

Rectal Examination revealed a lax sphincter with no
palpable mass in the rectum. There was no frank blood
on withdrawal of the examining finger, but a faecal
smear reacted positively for occult blood.

Investigations.

Blood – Hb = 55%. E.S.R. = 58 mm. W.D.C. = 5,800.
(Normal differential)

Biochemistry – within normal limits.

Urine – No chemical abnormality. No growth on culture.

E.C.G. — ST-T changes suggestive of ischaemia.
Stool — consistently +ve for occult blood.

Bio. Finding: Large irregular filling defect in the cæcum which is suggestive of carcinoma.
"Diverticulitis" of the pelvic colon.

Operation: Rt. Hemicolectomy.

Surgery = Mr. A.A. Gunn.
Incision = Rt. oblique skin crease.
Findings = 1. Carcinomatous mass in cæcum.
2. Liver and local glands not apparently involved.

Procedure = Rt. hemicolectomy with 10 cm. of terminal ileum.
Ileo colic anastomosis.

Histology = Well differentiated adenocarcinoma — with no glandular involvement.

Progress

The patient made a good immediate post-operative recovery, but on the 8th day she developed pain in the L.I.F., where there was found to be a tender mass. This was assumed to be an abscess developing from a leak in the ileo-colic anastomosis, but X-Ray
showed a distended loop of descending colon. This failed to respond to conservative therapy and Barium Enema was done, revealing "paradiverticulitis" with a pericolic abscess. A operation was thus indicated and a TRANVERSE COLOSTOMY was fashioned, with a drain inserted down to the area of inflammation.

During this operation, and immediately afterwards, the patient had great respiratory difficulty. She became apnoeic and required bronchoscopy, tracheostomy and I.P.R.R. Following this, she remained hypotensive despite large doses of metaraminol ("Aramine") and died within 24 hours.

Summary.

This was a patient of contrasts —

1. She presented with incipient Left Ventricular Failure.
2. Her primary lesion was a 'silent' carcinoma of caecum.
3. Her death was due to a pelvic diverticulum which had perforated during the phase of post operative constipation. This was a very unfortunate end to a potentially curable neoplasm.
Patient "6"

Diverticulitis Coli and Crohn's Disease, presenting with Fistula in Ano.

Mr. Gregory McLaren, Aged 67, Married.
Hutchison Crossway, Retired civil servant.
Edinburgh.

History of P.C. Mr. McLaren had had a double-lumen defunctioning colostomy carried out on a previous admission 8 months previously, when his complaints had been those of persistent rectal discomfort with discharge (for 6 years) and intermittent rectal bleeding (for 6 weeks). There had been a background of many years refractory constipation, but no diarrhoea, and no mucus or pus in the stools. The diagnosis at that time had been 'pelvic diverticulitis,' with

Presenting Complaints

Purulent Anal Discharge
Failure to manage Colostomy

3 months prior to admission.
a simple inflammatory fistula – supported by histological evidence.

The current admission was arranged on account of persistent anal discharge (without obvious blood), and extreme difficulty in colostomy management. Mr. McShan suffered from fairly advanced cerebral arteriosclerotic disease and also early Parkinsonism, which made him a difficult patient to manage at home.

His appetite had been "very poor" over the 8 months prior to admission, but his weight had remained steady.

Systematic Enquiry.

C.V.S. No exertional chest pain, palpitations, ankle swelling.

R.S. Subject to "asthmatic" attacks, particularly in the winter months. Last attack 6 months ago, for which he received antibiotics and bronchodilators. He is well between attacks apart from occasional dry cough, and wheeze after exercise.

A.S. Vide supra. No nausea, vomiting, abdominal pain.

c.u.s. No abnormal symptoms were elicited.

c.n.s. Difficulty in walking. Speech slow and slurred. Relatives notice a deteriorating memory and intellect.
Past History: Has lost much work over the years due to his attacks of asthma. There was no other significant feature. He had never had a surgical operation.

Family History: Own parents death — age and cause not known. No siblings. Wife — aged 66. Good health. 2 children (6+m) — alive and well. No evidence of family tendency to bowel disease or asthma.

Social History: Retired from responsible post in civil service 2 yrs. ago. Has been largely confined to house for past year. Does not smoke. No alcoholic excess. No pets in the home.

ht = 5'7"
wt = 86.1 lb.

Temp = 98° F.

C.V.S.

Pulse = 80/min. Regular in time and force. Volume good.
Wave form normal. Vessel wall easily palpable.
Both radial pulses were equal in force and synchronous in time.

B.P. = 130/84 lying in bed.
J.V.P. was not raised.
There was no abnormality on inspection of chest.

Apex Beat = impalpable.

Heart Sounds = I and II normal in all areas. No added
sounds and no murmur.

Fundi - no abnormality detected.
There was no evidence of peripheral or central
circulatory failure.

R.S.

Respiration normal. Rate = 22/min.
No cough, sputum, dyspnoea.
E.N.T. were not remarkable.

Chest was increased in A-P diameter and there
was some costal indrawing.
Trachea was central - thyroid gland not enlarged.  Expansion was poor bilaterally. Vocal faimitus seemed normal.  Percussion note was resonant throughout.  Breath sounds were vesicular in character.  Air entry was reduced at both bases.  High pitched expiratory rhonchi were widespread over both fields.  No abnormal vocal sounds were detected.

A.S.

Mouth, tongue, throat and breath were not remarkable.  Abdomen was not distended and moved well with respiration.

The colostomy appeared healthy but there was a thin purulent discharge from a sinus at the upper end of the wound.  (M.B. Operation was 8 months previously.)  There was no tenderness and no guarding.  Viscera appeared palpably normal and there was no specific abdominal mass.  Bowel sounds were normal.  No bruit was heard.  Hemial orifices were normal.  Inguinal lymph glands were not enlarged.  Femoral pulses good and equal.

Rectal Examination was not attempted in view of pain and purulent anal discharge.
G.U.S  Bladder and external genitalia were normal.

C.N.S  Patient was well orientated, but memory and concentration were impaired, and the speech was slightly slurred. There was no nuchal rigidity and no bruit over the skull. The carotid pulsations were equal and the cranial nerves were intact.

Motor  There were no involuntary movements. Power was good and equal. Slight spastic paresis in limbs on left. Coordination poor, particularly on left.

Sensation  Not impaired.

Reflexes  | R.  | ++ | + | +++ | +++ | ↑ |
          | L.  | ++ | + | +++ | +++ | ↑ |

Ankle clonus on left.

( Neurological Consultation: suggested a diagnosis of cerebral arterio-sclerosis with pseudo-bulbar rigidity. No treatment was advised.)

Investigations

**Blood**  Ho 79%  E.S.R. 54 mm  W.B.C. 16,200  (76% polymorphs)

**Urine**  No "side-room" abnormality. No growth on culture.
Biochemistry: Electrolytes normal. B.U.N. = 13 mg%.

Chest X-ray showed a patchy inflammation at the left base.

Swab from anal discharge grew a mixed flora — E. coli, Proteus m., Entercocci.

Ba. Enema not possible — per rectum. Per colostomy showed extensive "diverticulitis" of sigmoid colon with a stricture in the distal descending colon.

OPERATIONS AND PROGRESS:

1. 13 days after admission a synchronous combined excision of rectum and descending colon was carried out by Mr. Falconer and Mr. Gurn. [The proximal colostomy was left intact.]

HISTOLOGY. The appearance of the follicles was suggestive of

(a) Crohn's Disease

or (b) T.B.

or (c) Sarcoidosis

Absence of caseation and failure to grow tubercle bacilli made a diagnosis of T.B. less likely.

Clinical behaviour of the disease and gross appearance of resected specimen were not typical of sarcoidosis.

Absence of substantial ulceration in the sigmoid, and lack of aggregation of follicles suggested Crohn's Disease.
37 days after admission pus had to be drained from a perineal abscess and from an abdominal wound abscess. Healing of both wounds was very protracted.

82 days after admission a split skin graft from thigh was applied to the raw perineal wound. The graft did not take, but discharge from perineum and donor site cleared slowly with the application of 'Eusol' and saline dressings under appropriate antibiotic cover.

On the 123rd day after admission the patient was discharged home, arrangements having been made with the G.P. for dressing of wounds and with the district nurse for home assistance for the patient's wife.

Summary. The double pathology of Crohn's Disease and Diverticulitis Coli made radical surgical treatment very difficult; and the presence of progressive cerebral arterio-sclerosis added complications to the subsequent home management.
GENERAL DISCUSSION

Age and Sex. The average age of the 6 patients was 62 years, which corresponds to the decade of maximal incidence for diverticular disease, as revealed by most large series.

The sex ratio was 3 : 3

Obesity. Five out of the 6 patients were "over weight" to a variable degree. This is considered to be an important aetiological feature, often found in conjunction with refractory constipation, which was present in 3 of the patients.

Duration of Symptoms. The average duration of symptoms referable to diverticular disease was 5 years. A slow insidious progress with sudden onset of complications is typical of the disease.

Presenting Symptoms of diverticular disease are commonly:

- Abdominal pain
- Constipation
- Diarrhoea
- Colonic bleeding
- Abdominal distension

These /
These features are significantly modified in this series of patients, where complications requiring surgical treatment were specifically sought: Thus:-

Patient "1" showed the colicky lower abdominal pain, spurious diarrhoea and intermittent abdominal distension of a sub-acute colonic obstruction. Although, upon examination she was found to have large external haemorrhoids, these had not confused the presenting picture by producing intermittent bleeding which might have suggested malignancy.

Patient "2" was admitted as an emergency with absolute constipation and features indicative of a complete, non-strangulating obstruction of the large bowel. The rapid tempo of the disease suggested carcinoma of the colon - a diagnosis which was subsequently proven. Diverticular disease of the colon was present as an incidental finding.

Patients "3" and "4" illustrated pneumaturia and strangury on defaecation, the classical symptoms of a colo-vesical fistula.

The /
The presenting symptoms of Patient "5" were completely dominated by the presence of left ventricular failure and with paroxysmal dyspnoea. It was the result of a comprehensive search for the cause of an associated iron-deficiency anaemia which eventually incriminated double pathology within her alimentary tract - adeno-carcinoma of the caecum and diverticulitis of the pelvic colon.

Patient "6" presented symptoms of a fistula-in-ano, from a bowel which was shown to be the seat of both diverticulitis and Crohn's disease.

**Investigations.** The commonest findings in the 6 patients were as follows:

<table>
<thead>
<tr>
<th>Finding</th>
<th>No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrexia</td>
<td>1</td>
</tr>
<tr>
<td>Raised E.S.R.</td>
<td>4</td>
</tr>
<tr>
<td>Low Hb</td>
<td>1</td>
</tr>
<tr>
<td>Tender Mass</td>
<td>1</td>
</tr>
<tr>
<td>Positive Sigmoidoscopy</td>
<td>1</td>
</tr>
<tr>
<td>Positive S.O.B. (Stool Occult Blood)</td>
<td>3</td>
</tr>
<tr>
<td>Diagnostic Ba. Enema</td>
<td>6</td>
</tr>
<tr>
<td>Sigmoidoscopy /</td>
<td></td>
</tr>
</tbody>
</table>
Sigmoidoscopy is a valuable examination, if only in the negative sense that it can exclude any local pathology coincidental to diverticular disease. In 5 out of the 6 patients presented here, this examination was indeed negative, revealing no ulceration of mucosa, no bleeding, and no suspicious growth.

In Patient "6", biopsy of resected tissue was the investigation of paramount importance in establishing the diagnosis of Crohn's disease. Both tuberculosis and sarcoidosis had to be eliminated with certainty.

Radiological Features. In connection with the "Follow-up Pilot Survey", mentioned in the Introduction to this report, the barium enema films of the above 6 patients were amongst those which were reviewed and classified according to:

(i) Extent of diverticular involvement of the colon
(ii) Number of diverticula in the pelvic colon
and (iii) Radiological staging - "Prediverticulosis"
    "Diverticulosis"
    "Diverticulitis"
    "Peridiverticulitis"
It was found that those radiological features bore no strict correlation to the presenting clinical features. Thus, it seems as if the X-ray plate produces an unfaithful reflection of the clinical state in patients with diverticular disease. For example, Patient "5", who died following a perforated diverticulum, had a comparatively "innocent" radiological picture with less than 20 diverticula in her pelvic colon.

**Complications.** The commonest specific complications of diverticular disease are:

- **Obstruction** - illustrated by Patient "1"
- **Perforation** - illustrated by Patient "5"
- **Fistula** - illustrated by Patients "3" and "4"
- **Haemorrhage** - no examples are presented here.
- **Portal pyaemia**

It is estimated that diverticular disease is:

(a) the second most common cause of large bowel obstruction in the adult population, 
(1st = carcinoma)

(b) the commonest cause of an isolated, massive colonic haemorrhage,

and (c) the cause of 75% of all colo-vesical fistulae.
Differential Diagnosis of diverticulitis coli and carcinoma of the colon is a problem often encountered since both conditions are commonly found in the same age group. Indeed, they may present concurrently, as in Patient "2". It seems probable that such co-existence is purely fortuitous, and that there is no aetiological significance.

The clinical distinction between the two conditions is often baffling. Patient "1", for instance, gives a history which favours a diagnosis of carcinoma - short duration; alternating bowel habit; loss of weight and poor appetite. The radiologist lends support to this view by reporting that the filling defect on ba. enema is "suggestive of carcinoma"; and finally, at laparotomy, the surgeon is of the opinion that the obstructing mass "looks malignant". Yet the final court of appeal, the histology laboratory, reports an unequivocal diagnosis of "diverticulitis" with no evidence of neoplasia. The patient's subsequent clinical progress supported this.

Patient "3" illustrates that an isolated episode of fresh colonic bleeding, which may only be elicited on close investigation into the past history, is likely to herald /
herald diverticular disease rather than carcinoma, which tends to bleed frequently, in small amounts, in association with defaecation. "All that bleeds" is not carcinoma!

Unfortunately, in those cases where clinical and radiological impressions are most confusing, even sigmoidoscopy with biopsy may fail to establish the diagnosis if a non-representative portion is removed from a long segment of involved colon. Indeed, biopsy would have been a dangerous procedure in Patients "3", "4", "5" or "6" where active inflammation was present.

Perhaps, in the future, exfoliative cytology may have a useful contribution to make in resolving this difficult diagnostic problem.

**Treatment** of diverticular disease may be conservative or surgical:

A. **Conservative.** As stated previously, the 6 patients in this series were chosen to illustrate certain surgical aspects of diverticular disease, and conservative management did not figure prominently in any patient, except in the case of Patient "3" who had been treated with standard medical measures for nine months prior to his admission. This had apparently failed to prevent fistula formation.

Patient /
Patient "5", who perforated a diverticulum in the post-operative period, had been receiving morphine in standard dosage. This drug is unlikely to have been of direct aetiological significance in this perforation; but it is salutary to note that Painter and Truelove (Oxford) have recently demonstrated the abnormally high intraluminal pressures which may be generated in segments of colon bearing diverticula, after the administration of therapeutic doses of morphine.

B. Surgical Treatment. In the past, operation was only carried out after the development of specific complications. In the future, with the current trend towards earlier surgical intervention, operation will be carried out in the younger, fitter patient with indications such as:-

(i) Repeated attacks of diverticulitis, particularly those associated with pain, fever and tenderness indicating inflammation

(ii) Attacks increasing in severity, particularly in the patient aged less than 50 years

(iii) The onset of urinary symptoms, particularly in the male - as in Patients "3" and "4", but at an early stage before the urine has become frankly faeculent

(iv) /
(iv) Sub-acute obstruction - as in Patient "1" 

(v) Certain cases of bleeding per rectum in the absence of other pathology and in the presence of normal blood clotting mechanisms. This might have been considered in Patient "3" several years prior to his ultimate admission with a frank fistula.

The overall mortality for major colonic surgery after the complications of diverticular disease have developed is estimated at 40%. (Interesting, but of no statistical significance, was the 50% mortality within the six patients presented here.) This figure must be contrasted with a mortality of 0-4%, depending upon the surgical centre, for elective radical surgery during a quiescent phase of the disease.

Definitive surgical treatment is usually considered under the two headings of:

1. Palliative,

and 2. Radical,

1. Palliative. In this series of 6 patients, palliative procedures were:

(a) Laparotomy (and Peritoneal Drainage),

with (b) Colostomy

(Other /
(Other possible procedures are:

(c) Closure of Ruptured Diverticulum
(d) Caecostomy
(e) Enterostomy
(f) Enteroanastomosis
(g) Exteriorisation)

Procedure (a) + (b) was carried out in Patients "2", "4" and "5" as an emergency to relieve obstruction or to divert the faecal stream from the site of inflammation. Such colostomies are often to be regarded as preliminary to resection of the diseased colon - when the opening is usually made to the right of the mid-colic vessels to avoid interference with the collateral circulation of the left colon.

The method of choice is usually a transverse colostomy; occasionally a left iliac colostomy may be practicable, as in Patient "4", although the choice of this site is often limited by the degree of fixity of the colon due to peritonitis. Infrequently, with a localised area of inflammation, it is possible to utilise a perforated segment as the colostomy.

What /
What should be done with the colostomy after the emergency is over? Simple closure, without bowel resection, is always reported as giving poor results and was not applied in any of the 6 patients. The solution is usually to undertake, if possible, a radical procedure. Of course, many patients are very ill and quite unsuitable for this, as in the case of Patient "2" - Severe Diabetes Mellitus. Dehydrated ++.

and Patient "14" - Gross Respiratory Insufficiency with Myocardial Ischaemia.

The fact that a proximal diverting colostomy does not always arrest further complications is well demonstrated in Patient "6", who went on to develop severe pericolonic inflammation distal to his diversion.

It must be concluded that palliative procedures are uncertain of success in the treatment of diverticular disease and its complications.

Is radical surgery the answer?

2. Radical. On examining, at laparotomy, a patient in whom a defunctioning colostomy has been done several months previously, one is impressed by the fact that, while all active inflammation may have settled, the colonic diverticula /
diverticula are still full of faecal matter. This impression is confirmed by examination of resected specimens, and indicates why the area of bowel must be removed before one is certain of avoiding subsequent recrudescences of the disease.

The most suitable cases for resection are those in which the disease is quiescent and is localised in extent to the pelvic colon. This should ensure a safe end-to-end anastomosis.

There is no standard radical operative procedure for diverticular disease, many individual factors being involved.

In this series:-

<table>
<thead>
<tr>
<th>Patient</th>
<th>Procedure</th>
</tr>
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<tbody>
<tr>
<td>&quot;1&quot;</td>
<td>Left hemicolectomy as primary procedure for pericolic abscess.</td>
</tr>
<tr>
<td>&quot;3&quot;</td>
<td>Disruption of colo-vesical fistula with primary resection of affected colon.</td>
</tr>
<tr>
<td>&quot;6&quot;</td>
<td>Combined synchronous excision of rectum and descending colon for diverticulitis in association with Crohn's disease.</td>
</tr>
<tr>
<td>&quot;5&quot;</td>
<td>Right hemicolectomy for carcinoma of caecum. Diverticulitis of the pelvic colon was untreated at this stage. Perforation subsequently occurred.</td>
</tr>
</tbody>
</table>
In retrospect, it is interesting to postulate whether perforation (and subsequent death) might have been averted in Patient "5" by a concurrent excision of the segment of pelvic colon bearing the inflamed diverticula. However, the diagnosis of diverticulitis had not been clearly established at the time of the initial operation; and a combined operation at this juncture would have been of formidable magnitude. After perforation had occurred, the identification and simple closure of the ruptured diverticulum was impossible due to the friable state of the tissues; and a defunctioning transverse colostomy was fashioned.

In practice, resection for diverticulitis during a quiescent phase is often an easier technical procedure than a comparable operation for neoplasm, and the same care need not be taken to remove lymphatic pathways.

The patients who underwent radical surgery had full pre-operative preparation. This included:

(i) General measures; with close attention to chest infection, anaemia and electrolyte imbalance.

(ii) Local bowel preparation; both mechanical (with low residue diet, liquid paraffin, and enemata) and antimicrobial - the most useful agents, as judged by 'antibiogram' reports, were found to be "Soframycin + Ampicillin" or "Neomycin + Bacitracin".
CONCLUSION

The case reports on 6 patients have been presented, mainly to illustrate some of the surgical problems of diverticular disease and its complications.

The old policy of watchful waiting has become untenable, and in the ideal situation the surgical procedure of choice is a primary one-stage resection of the affected bowel with end-to-end anastomosis. However, such a method can not supplant good medical treatment in the majority of uncomplicated cases, and should not be substituted for multiple staged operative procedures in the presence of certain complications.