Emergency Abdominal Surgery
in a Provincial Hospital
with notes of 40 cases.

by
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Acute Intussusception.

Acute Intussusception in Bolton is a rare condition. The 5 cases given below being the only ones in a series of 30 cases of acute intestinal obstruction admitted into the Bolton Infirmary during the last 8 years. The number of in-patients treated in the Hospital during that time was 9232.

At the January meeting of the Bolton Medical Society a number of medical practitioners who have worked here from 15 to 30 years confirmed my opinion as to the local rarity of this condition, most of them never having seen a case in private practice.

This infrequency contrasts with that given by authorities who state that intussusception is one of the most frequent abnormalities giving rise to intestinal occlusion. It gives the percentage in 295 cases of acute intestinal obstruction of 32.7%, in favour of intussusception.

Among Manchester surgeons the impression is that the disease is increasing in frequency in this locality - certainly all my 5 cases have occurred during the last 18 months. These numbers are too small to indicate more than a mere coincidence and probably the supposed increase is due mainly to a quicker diagnostic acumen among the general practitioners.
Case 7. No. 1047:

Child, male, age 3 months.

Child previously healthy, was without any apparent warning seized with acute pain accompanied by vomiting. 36 hours after the onset the medical practitioner was called in to see the child because of the constant crying and also because of constipation. A simple soap and water enema was given with the result that only half an ounce of faecal stained fluid was passed. No stool was passed with the fluid. There was no blood in the fluid.

A carminative was given and the child seen 12 hours later. At the second visit the child was seen to be suffering from peritonitis: on palpation no tumour was discoverable although carefully looked for. There was general distension of the abdomen.

An hour later the abdomen was opened in the middle line and a tumour felt in the epigastric region and under cover of the ribs. It consisted of ileum invaginated into caecum & colon. The caecum had a long mesentery and occupied a space midway between normal site and hepatic flexure, at the apex of the intussusception there was a small polypus. The intussusception was reduced and abdomen closed.

Result: Death six hours later from shock & peritonitis.
Case II.

H.A. male - age 9 months. No. 683.

Two days before admission into hospital, child was suddenly seized with acute intermittent pain and diarrhoca. The following day vomiting began vomited matter consisting merely of stomach contents and was not faecal.

At first the medical practitioners treated the child for summer diarrhoca - but as the pain became continuous he sent it into hospital on the third day of the illness.

On admission - child cried as if in continuous pain. He vomited several times but vomit was never faecal. Evacuation from rectum were simply blood and mucus - there was also obvious tenesmus. Abdomen was distended.

On palpation - small nodule felt in left iliac fossa like small faecal accumulation. On examining per Rectum - a tumour was felt an inch above anus and the small nodule felt through the abdominal parietes was the upper end of an elongated tumour. Tumour was moveable and not very resistant.

Abdomen was opened at once. Intussusception was found in left side of pelvis - of the ilio-caecal variety. It was reduced. Result - death 4 hours later from shock
Case III. No. 598.

W. A., male, age 8 years.

Three days prior to admission the boy was suddenly seized, in the early morning, with an acute pain over the stomach, slight vomiting.

The previous evening he had been at children's party & had eaten freely of indigestible food. The pain & vomiting soon subsided. There was no pain or tenderness on pressure, no lump could be palpated. Bowels moved slightly, but there was no sign of any blood or mucus. The boy did not recover his previous good health - yet there was nothing definitely wrong with him until 3 days after the initial pain, when the vomiting recurred - it was not fecal. The abdomen became more rigid but not distended. An x-ray was given with the result that blood and mucus were evacuated from Rectum slightly tinged with feces. He complained of pain around the umbilicus - never acute & intermittent. He was sent into Hospital on the evening of that day - where he arrived in collapsed condition. He was operated on at once - but died on the table. An intestinal perforation was found of the anterior wall.
Case 17. No. 1108.

J.S., male, age 8 months.

Two days before admission child appeared quite well at mid-day. The mother gave it some fried onions at 11.30 p.m. Child suddenly began to cry as if in great pain - unceasingly for half-an-hour - then stopped for a short time, but cried off and on all night.

1 a.m. Vomited for the first time - vomited matter clearer fluid - vomited every now and then all night.

3 a.m. Bowels moved, and in the motion onion could be distinguished - no onions given to the child for at least a month before these given. In day of most of illness child strained all night after bowels moved - but there was no result until 7 a.m. when another motion - this time it consisted of blood and mucus - vomiting still continued also crying.

10.30 a.m. Medical man saw the child and provided medicine which stopped the crying.

She vomited continuously all day - and if it took the breast it returned the milk almost immediately. There were several bloody motions during the day.

8.30 p.m. The medical man again saw the child and injected water into the rectum but with no result.
a vomiting - staining evacuation of blood and mucus went on all night. Following morning the practitioner send the child into hospital. 

On admission child was collapsed. Vomituses cold vomitiing - not fecal. Pulse could hardly be felt.

Abdomen was distended and rigid - haemorrhage could be felt on palpation through the abdominal wall - but rectal examination revealed a tumour lying in pelvis - non-removable.

A little time was allowed to elapse to try and get the child in better condition for operation. Abdomen was then opened - and lying deep in pelvis was an intumescence of the viscus ovari.

Child died immediately operation was finished.

Case V:

R.C. male. age 52 years.

For the last 10 years Patient has kept a beer house. Previously to that he was Inspector of Police.

In last six years he has had Diabetes mellitus. He is a big soft flabby man. His bowels have always been loose.
3 days before admission he ate a heavy supper of mussels. In the early morning he was wakened by severe pain all over the abdomen. He also complained of feeling sick. All the next day he complained of a gradually increasing nausea but the pain became much less severe. There was no movement of the bowels.

On the morning of admission into Hospital he vomited for the first time. Vomited matter was dark, had a foul odour and a bad taste. Copies of sodium bicarbonate were given but he passed neither stools nor faeces. He complained of slight intermittent pain.

On admission the temperature was normal, pulse 710 per minute. Respiration was 24. There was no rigidity of abdomen and no distension. Vomiting was frequent and faecal. There was slight pain occurring intermittently - not localized but mainly umbilical.

There was slight tenderness in right iliac fossa on very firm palpation - no tumour could be felt. Nothing could be detected by rectal examination - no flatus or faeces passed. No sign of blood or mucus in return from enema. There was no tenesmus.
The abdomen was opened - but the man died,
before the operation went any further, from
asphyxiation - from using Ether as an
anaesthetic.

Intussusception was found - situated in the
Right iliac fossa about 6-9 ft from the
ileo-caecal valve. It was of the intussus-
ception variety - and was 10 inches in length.

Age & Sex.

Of these 5 cases, 4 occurred in children
under 10 years of age - and of these
4 - the ages of 3 of them were under
1 year. The 5th case on the other hand
was in a man in late middle life.

As regards the sex - all the patients
were males.

These facts are not uncommon - and
authorities as Dr. Raffinesque from
cases compiled by them have shown
that intussusception is most frequently
met with in male children in
the first decade of life.
Pathology - Ecology.

In this section I quote fully from Dr. Anyon's work on Intussusception - p. 55.

1. Anatomical Peculiarities

Spontaneous ileo-caecal intussusception occurs when the colon is considerably longer than the ileum and is so widely movable that it readily allows itself to become intussuscepted when once the process has begun - a long meso-caecum therefore would allow of great mobility - and this anatomical peculiarity was present in C.H. case 1.

2. Physiological Factors

These are of great importance and in all probability apply to every form of intussusception. Speaking broadly as regards the ileo-caecal portion of the intestine - increased mobility coupled with an unduly rapid growth in the width of the large intestine is associated with irregular and increased peristaltic movements of the colon. The peristaltic wave coming from the ileum becomes arrested at the ileo-caecal valve and a new active peristalsis begins at this place. The ending of the ileal peristalsis and the
beginning of the colon peristalsis does not occur simultaneously, and Dr.ancy Power thinks that the invagination is brought about in such a manner that the caecum swallows the ileum.

Children are especially subject to irregular twitching of muscles and these are commonest when a child droops off to sleep and during the act of waking. Twitchings occur both in the voluntary and involuntary muscles. This may explain why symptoms of intussusception so often appear at the instant a child wakes. Why it is that boys rather than girls and the best grown and most active children are attacked as often as those who suffer from chronic inflammatory affections of the intestinal tract.

In Case II the medical practitioners had diagnosed summer diarrhoea and in all probability this inflammatory condition had unduly heightened the irritability of the intestinal muscle, causing irregular twitching, and so aided in the formation of the intussusception.
Eating of unsuitable & irritating foods I believe to have been the initial cause in producing the invagination in case III. IV-V.

In case III. indigestible cakes & probably an excess of them. Case IV. The fried onions in a child so young as 8 months.

Case V. the large quantity of mussels. Similar cases have been recorded by Max Baur and Leichtenstein. They have had cases where men have been seized with symptoms of invagination after eating large quantities of cherries.

It is quite likely that these mechanical causes do produce an intussusception for many of them might lead to a sudden limited constriction of the gut associated with an active peristaltic movement of a neighboring portion sufficient to draw the receiving layer of gut over the contracted part. Which thus becomes the apex of the intussusception.
Symptoms considered individually.

Pain in acute intussusception is almost always present in some form or degree. Alone, obviously, it must be of little value yet when taken in conjunction with other symptoms, it proves to be of matter of importance. In most cases, pain comes on without any previous warning and is of an acute colicky nature. In 4 of my cases, the pain was of this nature. In the other case, i.e., Case III, it was present as in the others on the first day, but it was not at all severe.

As regards the character of the pain— in Case I and II— it was continuous at onset, later becoming intermittent—Case III—slight at onset, later becoming intermittent—Case I was continuous at onset— but in this case the condition was rapidly fatal. Had death been postponed, it is quite possible that it might have been intermittent.

Case IV showed continuous pain at onset.

But the pain, given relieved the pain and presented any later characters being noted— a continuous pain at the onset, later becoming intermittent— seems to be the
general rule - only one of my cases - Case ii was a real exception - in this case - the pain began as an intermittent pain later becoming continuous.

The pain was located in only two cases. Case iii - the other 3 patients being too young to give any definite information. In both cases in which it was located, it was referred to the region round the umbilicus and in these two the imagination implicated small intestine alone.

Vomiting and Vomiting.

Vomiting in intussusception appears shortly after the initial pain. In my cases vomiting was present in all but in every case was there a distinct variation in the time at which it appeared.

Case i - vomiting was synchronous with pain.
Case ii - vomiting began 24 hours after pain.
Case iii - vomiting appeared on the 1st day of the illness but only slightly - this was probably reflex - no further vomiting was seen until the third day when it became very frequent.
Case IV - vomiting came on about two hours after onset of pain, and was frequent and persistent until death.

Case V. R.C. An adult. Nausea was complained of on the first day, but actual vomiting was delayed until the third day, and then rapidly became fecal.

Fecal vomiting rarely shows itself until after the third day, and the fact that in the children there was never any fecal vomiting may be explained by noting that in none did the duration of the illness extend over three days.

Authorities state that in cases of invagination involving colon alone it is not uncommon to find the vomiting delayed, but in Case V where the intussusception was purely of the enteric variety - no part of colon being implicated - the vomiting was delayed as stated above until the third day.
Presence of Tumour:

The presence of a tumour is a most important sign in making a definite diagnosis of tuberculosis.

Sehnlein (Diseases of the Lungs, 19th ed., p. 262) says that in 610 reported cases he examined he found a statement concerning the presence of this sign in 308.

In 433 cases collected by Leichlin, a tumour was present in 222.

Treses states that it may be felt either by rectal examination or by abdominal palpation in 80% of the cases—but this latter statement seems to be a much larger percentage than most authorities allow.

In my series this valuable sign was only present in two cases—although always carefully looked for.

In the two cases in which it was felt it was found by rectal examination (Cases III and IV).

In Case I—the infiltration being under cover of the ribs prevented it from being felt.

Case III—the elevation involved the small...
intestine alone and was deeply situated.

Case IV - after when the abdomen was opened the ileum was found to be 10 inches long - yet it was deeply situated which partly accounted for it not being detected - but a more important obstacle was the very large amount of fat contained in the abdominal panniculus.

Evacuations.

Cases I to IV showed insuperable constipation and notwithstanding this there was no evacuation of blood or mucus.

The evacuation of blood and mucus is a very important sign.

Cases III and IV in varying degree all had haemorrhagic evacuations.

In Case II this was a preliminary diarrhoea but later blood was passed.

In Case III there was at first slight mucous faecal motion but later blood and mucus showed themselves.

Case IV - bowels moved faeces being passed - but 3 hours later and only 8 hours from onset of pain - blood and mucus was passed and continued to be viced
Several times subsequently.
The faecal evacuations in these cases were
confining to the earliest stage of the illness
and were probably due to an emptying
of the bowel below the obstruction.
so that speaking accurately all cases
showed absolute blocking of the gut
in the passage of faeces which is the
natural consequence of the formation of an
intussusception.

This is the general state of things except
in some rare cases where the lumen
of the intussusception is not absolutely
blocked. and in these cases the
appearance of the evacuations is almost
like that in dysentery.

Meteorism + Tenesmus.
Meteorism seems to be as often absent
as present in intussusception.
Case i + ii - showed it but not to any
marked degree.
Case iii - presented this symptom well
marked as illness advanced.

In cases iii + iv - meteorism was absent.
Cases ii + iv showed marked tenesmus.
and in both these cases the intussusception had advanced to within 2 or 3 inches of the anus.

In my opinion the presence of this symptom depends on how far the condition has advanced—and the lower down it has come the greater is the tenesmus. Boas (c. 422) attributes great importance to this symptom. According to him the only other intestinal obstruction in which it is found is volvulus of the sigmoid flexure and even then but rarely.

But although the presence of tenesmus in a case of intestinal obstruction may confirm the diagnosis of intussusception yet its absence by no means negatives the condition as most authorities agree that it is rarely present more often than in about one third of the cases.
Internal Strangulations.

The second series of cases that I have introduced into this Thesis is one of internal strangulations of the gut by various constricting agents: omentum, mesentery, omental bands, adhesions, appendix, bands, etc.

The frequency with which these strangulations occur is remarkable. All acute intestinal obstruction cases filly concludes that they are second only in importance to intussusception.

From the cases admitted to this Hospital during the last 8 years, I have collected 9 cases: 7 of them due to intimal strangulation proper from bands, etc., and two from kinks produced by old adhesions.

These figures show that here these cases are equally as frequent as cases of intussusception if not more so.
Case 7.
Intestinal strangulation by Meckel's Diverticulum.
F.P. male. age 21.
Patient suddenly seized with acute abdominal pain - 4 days before admission. It was general over abdomen - but more acute on right side. No flatus or feces passed 5 days before admission.
Vomiting began with the pain - persisted and later became fecal - Persistent hicouroph. - Abdomen generally distended and rigid.
Patient was admitted in this condition.
Laparotomy performed - Small intestine found constricted by band - This was divided. - Flatus passed after operation.
Temperature on 3rd day after operation rose to 104.2° - pulse was 126 per minute.
Death on 3rd day after operation.

Post mortem examination.
Band was found to be a Meckel's Diverticulum at one end it was adherent to cutaneous abdominal wall - and the other end communicated with ileum 18 inches from its caecal valve. There was a distinct lumen leading into ileum. Diameter of band was 1/4 inch.
Case III.

Intestinal Obstruction by Meckel's Diverticulum.

A. L. male. age 22 years.

Acute abdominal pain began suddenly nine days before admission. Frequent persistent vomiting began with the pain. Later it became faecal. No flatus or feces passed since pain began.

On admission there was great distension and rigidity of abdomen. and the patient was in a state of collapse.

Abdomen opened - Small intestine found constricted by band and faunenous.

Band was divided and gut resected. Death six hours later.

Post-mortem examination.

Band was found to be Meckel's Diverticulum - arising from and communicating with ileum about 1 foot from ileocecal valve - at its distal end adherent to the anterior abdominal wall.

Small intestines were generally distended and congealed.

There was general peritonitis.
Case III

Intestinal strangulation by Hekel's Diverticulum

S. R. H., female, age 12 years.

Four days before admission - Patient was suddenly seized with acute pain in abdomen while walking. Pain was more acute in left iliac fossa. The pain was followed immediately by vomiting - vomiting later became fecal - and persisted up to time of admission.

No feces or flatus passed since beginning of the illness.

On admission, the abdominal distension was marked - also rigidity.

Laparotomy performed - consticting band divided.

Death 4 hours later.

Post-mortem Examination.

The consticting band was seen to be a Hekel's Diverticulum.

It was found arising from ileum a foot from the ileocaecal valve. The diverticulum was 5 inches in length from its apex a fibrous
cord extended 2 inches in length to be attached to mesentery of small intestine lying in left iliac fossa. This fibrous portion had constricted the small intestine which was markedly congested.
Case IV.


About 5 years ago - patient was treated for lead poisoning. He was six weeks ill with acute abdominal pain - vomiting and constipation. He had two similar attacks subsequently - one 4 years ago and one two - each lasted 10 days and was characterised by acute abdominal pain - no movement of bowels and persistent vomiting - vomited matter being very foul -

Since last attack - patient has been quite well until 4 days prior to admission. At 6 a.m. on that day - he was suddenly seized with an acute gneifying pain in the epigastrium - accompanied by vomiting which has persisted. Bowels have not been moved since the beginning of the attack.

On admission: Pulse 110. Temperature 99° F.

Tongue brown but moist - retching and vomiting every few minutes - vomit faecal.

Abdomen distended especially in epigastrium distended bowel outlined running transversely across abdomen - abdomen rigid and fixed - nothing felt on palpation - percussion note dull in both flanks - otherwise tympanitic -
Laparotomy performed. With first incision an adherent Meckel's diverticulum was opened into with oil opening general peritoneal cavity.

This was closed and a second incision made above umbilicus. Cause of obstruction was not felt—so owing to state of the patient a loop of small intestine was brought out fixed in the wound opened.

Death in 40 hours.

Post-mortem examination.

Patient Meckel's diverticulum was found arising from the ileum about 3 feet from the caecal valve. It was adherent to abdominal wall just below umbilicus and here it had been opened by first incision. This diverticulum was constricting small intestine.
Case V. no. 634.

Intestinal strangulation by adherent vermiform appendix.

J.H., female, age 30.

36 hours before admission - patient seized with sudden acute pain in abdomen, not localized, accompanied by severe persistent vomiting, which rapidly became faecal. No flatus or faeces passed since beginning of the attack.

On admission - patient was in a state of collapse.

Temperature 96. Pulse 160.

Abdomen greatly distended and rigid.

Laparotomy performed.

Vermiform appendix was found attached by its distal end to small intestine, drawn out forming a band which had become the constricting agent. Death 4 hours later.
Case vi.

G. B., female, age 16 years.

Patient quite well up to 4 days before admission - then while working she was seized with sudden acute pain in abdomen - not localized - quickly followed by sickness and vomiting.

Following morning pain and vomiting worse - vomit varied from dark brown to yellow - not faecal. - Bowels not moved since illness began - no flatus passed.


Abdomen opened - omentum adherent to abdominal wall at many spots. Through one of these apertures a knuckle of bowel had passed and become strangulated. Peritoneal cavity contained semi-purulent fluid. - Death 36 hours later.

Post mortem Examination.

At site of stricture on bowel peritoneal coat entwined and muscular coat partially destroyed - General peritonitis.
Case VII no. 427.

A. H. male, age 17 years.

For some weeks patient has complained of pain in abdomen - not localised and not very acute. His parents attributed these pains to injudicious diet, ice cream, etc.

3 weeks ago patient had a very acute attack of abdominal pain - subsided in two days but has recurred frequently since.

Two days prior to admission he was suddenly seized with acute pain in abdomen general not localised. No faeces or flatus passed since - leucocytalysis gave no result.

On admission patient was in great pain - most acute in epigastrium. Great distension of abdomen + absolute rigidity.

Persistant vomiting which began with the pain. Vomit - greasy fluid not faecal.

Laparotomy performed - two fibrous bands found constricting + strangulating small intestine. These divided.

A caseating tubercular mesenteric gland removed.

Another found in calcaneous state- this was left alone.

Result - uneventful recovery.
Case VIII. No. 1014.

A. W. female. Married. Age 43 years.

3 days prior to admission, patient wakened in early morning by acute pain in abdomen shooting from one side to the other and mainly in lower abdomen. This was not accompanied by vomiting. Pain has continued up to time of admission but varies in intensity. She has only vomited once—24 hours before admission.

No movement of bowels since day before pain began. Tenesmus from onset. No blood or mucus passed.

On admission, patient was pale with anxious expression. Pulse 140. Temperature 98.6°. Abdomen generally distended—walls rigid. Respiration costal. In upper abdomen distended transverse colon stood out prominently.

On palpation no tumour felt—broad sense of great resistance felt along whole of left flank. Percussion note dull in flanks—due to fluid. Other wise note tympanitic—Transverse colon greatly distended.

Recto—Bimanual Examination.

Uterus enlarged—uterine fibroids felt on pelvic wall of uterus.
Abdomen opened. Large quantity of ascitic fluid escaped. Uterine fibroids felt. Descending colon bound down by old adhesions. traction on adhesions had produced kinking of gut at splenic flexure, so producing obstruction.

24 hours later - patient aborted six weeks fetus - died from collapse shock almost immediately after abortion.
Case #10 No. 365

Intestinal Intussusception - Kicking of jet round a Calceaneous Mesentric ileum.

L. R. Female age 13 years.

P. 4 days before admission was seized with sudden acute abdominal pain while walking. Pain accompanied by vomiting. Pain & vomiting became persistent. Her flatus & faeces passed since onset of illness. As she was rapidly getting worse she was sent into hospital.

On admission - her features were pinched and anxious looking, but she was mentally acute. Temperature 99°F but rose to an hour later to 101°F. Pulse 125. Respiration 36 Shallow and purely costal.

Abdomen was distended and rigid - peristaltic movements visible.

Abdomen opened - large calceaneous gland found in mesentry close to mesentric border of portion of small intestine. Contraction of uterus had caused kicking of bowel round this hard mass. Besides this bowel was adherent to its own mesentry over the mass - producing a second cause of the obstruction.
Death occurred 3 days later, from general peritonitis.
Post-mortem examination.

Several other tuberculosis glands were found in calcaneous condition—but less in size than the one which had produced the burning gut which had been touched was much congested but not jaunyous—there was general peritonitis.
Age.

The most noticeable feature as regards the age of patients suffering from this class of acute obstruction is that none occur in early childhood and that the majority occur in adult life. This forms a marked contrast to obstruction from intussusception which is essentially a disease of infancy and early childhood.

Sex.

From these cases no conclusion that sex has any influence or direct bearing on the causation of acute intussusception can be drawn. One fact may be accentuated, and that is that in the four cases of strangulation by Hirschel's diverticulum - three of them occurred in males. In 21 cases of strangulation by vitelline remains, Professor Fitz found that 70% occurred in males.
Symptoms considered individually.
Retention of flatus and faeces.
In every case in this series, retention of flatus and faeces was the invariable rule. This symptom was present in all from the beginning of the attack. It is all probably come on before any other symptom and is quite likely to be mistaken for an attack of simple constipation. Any mechanical closure of lumen must necessarily block the passage of gaseous, liquid or solid matter.

Pain.
Acute pain was complained of in all these cases and was the first sign that anything was wrong. In all probability the retention of flatus and faeces is the first result of the obstruction and that immediately following on that we get a stretching of the intestinal coat of intestine, immediately above the blocking, causing the initial pain. The congestion and inflammatory changes taking place at the seat or rather above the seat of the obstruction will also increase
the intensity of the pain. In the early stages before complete paralytic ileus has been established - peristaltic movements of gut above the stranulation will maintain the pain. Latin states general distension of gut and general peritonitis which so often is a sequence of intestinal stranulation will keep it up.

The pain is described as a sudden acute pain - not localised as a rule - but areas of greater intensity are pointed out. These areas do not seem to have any significance as an aid to localising the seat of the stranulation for they may be found in any part of the abdomen.

If the pain were circumscribed at the onset of the illness could be definitely localised then it might have a significance as indicating the seat of the lesion - but certainly in the later stages it can carry no weight.
Vomiting.

This is a very constant symptom in acute intestinal obstruction from strangulation.

It can be divided into two classes -
(a) non-faecal  (b) faecal.

These two classes are distinctive as regards their cause, character, and time in course of the disease at which they appear.

The initial vomiting is of a simple non-faecal character. This can not be due to a damming back of the contents of the intestine or overfilling of loops of gut, because sufficient time has not elapsed to allow of this.

The vomiting begins with the pain, and the only explanation feasible is that it is due to a reflex stimulation of the nerves of the intestine and peritoneum by the pain produced by the strangulation.

The vomited matter consist first of all of stomach contents - later yellow bilious fluid - and not as a rule until the third or fourth day do we get the faecal vomiting.
As a result of complete blocking of the gut, liquid and pulpy intestinal contents collect in great quantities at the site of the obstruction. These large quantities of fluid containing albuminates decompose readily—gases being formed which give a distinctly fecal odor. How these contents come to be vomited was explained by Segarret of Montpellier in 1713—and it is still accepted as the true explanation—as a result of the development of gas, great pressure is exercised on the intestinal contents above the site of the obstruction. This pressure is increased during vomiting and especially by the energetic contractions of the intestinal muscles. Under the influence of this pressure—the contents are displaced upward in the direction of least resistance—that is, upwards and thus get into the loops next to the stomach. An overflow of these feculent contents takes place into the stomach and so initiates its mucous membrane that vomiting sets in (vide Hemmelin. Diseases of Intestine. Vol. 1, p. 161). This delay in appearance of fecal vomiting accounts for the fact that in some cases of
acute obstruction no fecal vomiting is recorded. for the patient may die of shock or exhaustion before the case has gone on long enough for the over-filling of the loops and development of gas to have taken place.

If the obstruction occur low down in large intestine as in case viii, fecal vomiting may be long delayed or may not occur at all.

One remarkable fact about the vomiting in acute intestinal obstruction is the large quantities of fluid that are brought up—far in excess of fluid taken in.

The explanation of this seems to be that the increased peristalsis and irritation of intestines stimulates the secretion of the intestinal juices and probably other juices poured into the intestines—and these aid in over-filling loops of gut.

The early onset of vomiting is more marked in these cases than any other—and is of diagnostic significance in determining whether or not the obstruction is due to an internal strangulation of the small intestine or to an intussusception—From my cases of intussusception it appears
to me that vomiting comes on at an interval after the pain - which may be considerably - and not synchronous with it as in intestinal distention.

Cases of hysterical faecal vomiting have been recorded by Trees and others - and the following case is one where faecal vomiting due to hysteria seems to be only possible diagnosis.

Case 7. No. 846.

C.B. female unmarried, age 27.

A week prior to admission patient complained of flatulence and nausea. She vomited once - this passed off for 5 days she felt well.

Bowels were moved regularly and there was no more vomiting.

Two days before admission she complained of nausea and persistent vomiting set in.

Following day vomiting still persisted and was markedly faecal. No flatus or faeces passed during these two days.

There is a previous history of an attack of vomiting which persisted for 48 hours but was never faecal. This occurred 7 months before.

On admission -

Patient was in highly manic state. Colour is good. No anxious expression on her features.
Temperature was 98.4°. Pulse 80 and strong.

She vomited every few minutes - definitely, fecal vomit. She complained of a little pain in epigastrium - 4 hours later she said it was over the lower abdomen.

Abdominal wall was rigid - respiration being purely costal. There was slight general distension - slightly more marked over right-iliac fossa.

Palpation of abdomen gave no information - no tumor to be felt. No marked tendon reflex pain.

Percussion note was tympanic all over - no dulness was distension - Right iliac fossa.

Liver dulness was certainly absent.

Soap and water enema was given - only a little flatus passed. This was administered 4 hourly with little result. - Nothing was given by the mouth - nutrient enemata given.

Fecal vomiting went on for four hours after admission - after that it was only occasional and there was no vomiting of any kind after 24 hours. Liver dulness was absent for 3 days and then gradually returned.

On the third day after admission return from the enema was slightly tinged later.
A small quantity of faeces was passed.
Gradual return of bowel functions.
Recovery was uneventful.
Six months later, patient had had no return of the symptoms and was in perfect health.

Mioteriosis.
In all these cases, miotoriosis was present to a greater or lesser degree and as a rule appears early in the course of the illness.
In Cases iv, viii - a distended loop of bowel stood out prominently. This sign first described by von Wahl was usually indicative of the loop immediately above the obstruction. Certainly in Case viii the bowel which stood out was immediately above the hindgut. But in Case iv, I can’t speak dogmatically on the point.
This sign is not always recognisable and in many cases only the two mentioned showed it. Although it was always looked for.
Peastalisis was absent in these cases.
Visible peastalisis is an important point in the differential diagnosis of acute intestinal obstruction from obstruction due to
a chronic cause such as a malignant tumour. In these latter cases visible peristalsis towards the site of the obstruction is a marked feature, whereas in acute intestinal obstruction such as we see in an intestinal strangulation, visible peristalsis is either absent or so slight as to be very difficult to recognise.

A true obstruction of the gut may be produced by foreign bodies within the lumen of the bowel or pressure on bowel from without.

Two cases of clinical interest of this nature I append here:

Case XXI. Ms. 845.
Obstruction of gut due to impaction of a gall stone at ileo-cæcal valve.

F.J. Female, age 51 years.

Previous history.

3 weeks prior to admission, patient was suddenly seized with acute general abdominal pain. This gradually diminished in severity, but she was never quite free.

8 days previous to admission, she began to vomit at irregular intervals, and 5 days later it became persistent and faecal.
5 days before admission she passed faeces and flatus but none since

There was no previous history of gallstones.

On admission -

Pulse was 125 per minute and weak.

Temperature was subnormal - extremities were cold. She complained of pain especially in epigastric region. There was faecal vomiting at short intervals.

Abdomen was distended and the abdominal walls were rigid.

P collapséd suddenly and died.

Post-mortem examination.

Gall Bladder contained 4 small stones. It was adherent to the Duodenum. There was a perforation of the Gall Bladder leading into Duodenum and through this a large gall stone had passed.

The Gall stone had been caught at the ileo-cæcal valve and blocked the opening above the block. The small intestine was much distended and congested - and its contents were faecal.

The large intestine was collapsed.

This case illustrates a new form of obstruction,
and one where the difficulty of diagnosis is very great.

That there should have been no history of gall stones or jaundice is not surprising—
as the stone had no relation to the bile ducts and would not cause blocking of them—there would be no jaundice.

And as long as a gall stone remains in the biliary system there need be no gall stone colic.

The first pain this patient complained of 3 weeks prior to admission was due in all probability to the preparation into the duodenum.

The fact that feces were passed after the vomiting began does not prove that the gall stone only imperfectly blocked the lumen at first; for it is more than likely that it was only an empyema of large intestine— and this theory is confirmed by the collapsed condition of large intestine as found in the Cecalis cadaveric.

The rather prolonged history of the case indicates a blocking of the lumen rather than an obstruction by strangulation etc. Also absence of initial vomiting would aid in the diagnosis.
Case xiii. No. 283.

Case of Obstruction due to compression of Rectum by Retroflexed uterus.

Mrs. female. Married age 42 years.

3 days prior to admission - Patient was suddenly seized with severe abdominal pain - mainly localized round umbilicus.

There was no vomiting at the time and only once a diuretic since - and then merely stomach contents.

Patient states that her bowels have not been properly emptied for 5 weeks. What she has passed has been chiefly mucous.

Since pain began she has passed neither flatus nor feces.

She was sent into Hospital as a case of acute intestinal obstruction.

On admission -

Temperature 101.2° F. Pulse 140 - weak.

Patient complained of abdominal pain - not very acute and mainly localized round umbilicus - she also complained of Tenesmus.

Abdomen was distinctly generally - but contour vary irregular - coils of small intestine
Abdominal walls were not rigid but the movement was very limited.

On palpation—hard mass could be felt in left iliac fossa, and on pressure it was distinctly tender.

Tenderness was not marked elsewhere.

Percussion note was tympanitic except in left iliac fossa over descending colon where it was dull.

Recto—bimanual Examination.

Utens marked, slightly tender, pressing and blocking rectum—which was balloonised below this.

Rectal bagpipe of only small calibre could be passed beyond compressed part.

Utens replaced with difficulty.

Epsom saline given—small quantity of faeces passed and little flatus.

Following day—free evacuation & late recovery.

In this case—diagnosis could not be made until the result of treatment was seen.

But with the replacement of the uterus and Epsom saline given—the condition was relieved—and no tumour or other obstructing agent was present.

Lilii in his study of faecal tumours has concluded that obstruction from faeces
may be excluded from the series of acute intestinal mechanical obstructions, because acute abdominal pain, meteorism and straining, vomiting were very rare and late symptoms - while even nausea and vomiting were of late occurrence.
Traumatic Rupture of the Gut.

This series of cases comprises 4 cases of Traumatic Rupture of the Gut.

In no class of cases is an early diagnosis more important for the only hope of safety lies in proper treatment early carried out. Unfortunately there is probably no traumatic lesion which is more indefinite as its symptoms.

Not only from the clinical aspect are these cases important, but also tremendous issues may depend upon them from a medical-legal point of view.
Case 1.

T. P. male. age 67 years - carpenter.

Stuck in abdomen by piece of wood from

sawing machine - slight pain at time due to

blow. Accident happened at 9 a.m. continued
to work until 12 noon - dinner hour.

Went home and began to vomit - acute
pain came on - had to go to bed - pain
and vomiting continued - next morning
24 hours after accident he called in his

doctor - vomit was then fecal. He was

sent at once into hospital.

On admission he complained of acute
abdominal pain - not localized to seat of
injury or any other part but general
he had fecal vomiting.

Abdomen was distended and rigid -
cutaneous veins were dilated.

There was distinct oedema over the
abdominal wall on right side extending
inward to outer margin of rectus abdominis
downward to iliac crest - upward to costal
margin - most marked about centre of the
area. Rises of abdomen was diminished by two
inches. Pulse was 140 per minute +

small. Temperature 97.8° F.
on opening abdomen - rupture of ileum was found one foot from ilio-caecal valve situated opposite ilio-mesentric attachment extending for 1½ inches in the longitudinal direction of bowel. Abdominal cavity filled with faecal fluid - Rupture was closed.

Result: death 4 hours later - septic peritonitis.

Case 11. no. 639.
J.H. M.B. age 22 male.
Patient fell down a lift hold with several other men - distance 50 feet.
General practitioner called to the accident gave him hypo-duric injection of morphine for acute pain and sent him into Hospital at 5.30 p.m.
On admission - he said he felt all right. All that was found on examination were a few bruises but he looked worse than he seemed to be so he was detained. At 2 a.m. nine hours later he began vomit to complain of pain in abdomen. Pain was general but not acute. At 9 a.m. 16 hours after accident pain became very acute and general. Vomiting was faecal. Face pale pinched and anxious looking.
Pulse 150 per minute - weak and running.
Temperature 97°F.
Abdomen round like a barrel; liver dulness normal.
Abdomen opened at 5 p.m. 24 hours after the accident - a large cyst found near the duodenum - jejunal junction - situated at the free border of the gut away from the mesentery, and running transversely. It was large enough to admit an ordinary test-tube. Free gas and chyme stained fluid escaped in great quantity. There was general peritonitis.

Patient died immediately after leaving the operating table.

Case 133 - No 671.
P.C. male age 48.
Admitted drunk - said to have been kicked in abdomen. He had a lacerated wound of right lower quadrant. No other marks of violence. Vomited on admission - urine drawn off and found to be healthy.

Pulse 80. Temperature 98°F.
36 hours after admission he said he felt all right and insisted on going home. At midnight, 12 hours after leaving hospital
he sent to say he could not pass his water.
The House Surgeon visited him - and found
the Bladder distended 1½ inches above pubis
He also complained of pain in abdomen
but not severe. He was catheterised &
advised to come into Hospital again - but
he did not arrive there until 12 more
hours had elapsed.
On admission he was collapsed and pulseless.
Temperature 96°F.
Abdomen distended. Peritonitis diminished
by 1½ inches. He was suffering from
persistent vomiting. Vomit: hot faecal.
He complained of inability to pass urine -
catheter passed but bladder empty.
He died one hour after admission.
Post mortem examination.
On opening abdomen foul gas escaped - peritoneal
cauliflower contained faecal fluid. Bowel coils
adherent - recent peritonitis. Bladder collapsed
and empty but uninjured
4 inches from ilio-caecal valve. Injury
was found. There was a minute tear
in the mesentery at the point where its
two layers separate to enclose the
triangular space adjacent to the gut.
There was a linear necrotic ring encircling gut opposite tear in mesentery - and at the part farthest away from the mesentery there was a small perforation about size of a pin's head. Gut was converted for about 1 inch on either side of the necrotic ring - there was no bruising of abdominal walls nor any external sign of violence. He supposed assailant was charged with murder but proved an alibi and was discharged.

Case iv.
W.H. male, age 7 years.
P. admitted a pain an hour after having been run over by a milk cart.
On admission he was semi-concious, face pale, Pulse 80, Temperature 98.6°F. There was a scalp wound over left parietal bone and bruises on face and hips. There was no external injury or bruising of abdomen. He vomited once. He rapidly became conscious but was very restless and complained of pain in his head. There was no abdominal pain, no tenderness - no distension no rigidity.

11 a.m. following morning - 16 hours after accident - had an epileptiform seizure - longstanding history of similar seizures.

Face pale lips livid - Pulse 136 - weak. Temperature 99.4°F. immediately before seizure.

Two subsequent seizures - in the second of which he died at 12 noon.

Post-mortem examination.

Abdominal cavity contained quantity of dark coloured fluid - no smell - absence of peritonitis.

Bowel was punctured in two places uppermost injury was situated in the first part of ileum lower one two feet below first. Perforation in each case was at the free margin of the gut - and about size of pea. In the mesenteric lip of upper injured part one inch from the bowel there was a blood clot about size of a marble.

Bowel concreted for two inches on either side of the perforations.
Site of Rupture.

In many cases the rupture occurred in the ileum in 3 and in the jejunum in 1.

Statistics of the relative frequency with which these two parts of small intestine are injured show that jejunum is just as likely to be injured as the ileum. Mayland in 10 collected cases shows that ileum was injured in 6 and jejunum in 4.

(V. Surg. of Alimentary Canal. p 356.)

In 10 cases collected by Crop between 1870-1890 the ileum was in ileum in 7 cases and in the jejunum in 3. (V. Trans. Chin. Soc. Lond. 1890 vol. xiv. p 197.)

Poland's paper records 20 cases of which injury was found in ileum in 16 and in jejunum in 14.

(V. Guy's Hospital Reports. 5th series. vol. xiv. p 143)

In my opinion in a case of supposed traumatic rupture of gut the two sides to be first examined are (1) gut near the duodenojejunal junction and (2) near the ileo-cecal valve.

That is the gut near the two more or less fixed points. The reason being that because of this fixation the gut
is more likely to be injured there than at a part which is floating freely and able to slip away before a direct force.

In case of indirect violence as in falling from a height (J.H. McI. Case II) the stress is more likely to fall on that portion of the intestine which is least movable - thus coming on the jejunum. Whereas in injuries produced by direct violence the site will vary to a great extent with the nature and position of the momentum.

Symptoms considered individually.

Pain.

It is noteworthy that in all these cases it was only after a considerable interval that pain became a marked symptom. The exception (T.P. in Case I) is more apparent than real as in all probability it was due to the injury to the abdominal wall - the pain due to the rupture did not manifest itself until some 2 hours after and then in contrast to that previously felt slight and localized - it was severe and diffused over the whole abdomen.

Case II (J.H. McI). The acute pain in the
abdomen for which the General Practitioners
gave the morphia - was of slight duration
for when admitted to hospital half an hour
later he said that he was not hurt and told
the house surgeon to attend to his companion
first. There was no recurrence until an
interval of 9 hours had elapsed.
Case iii. (P.C) Probably the rupture here was
secondary to the lesion of the mesenteric vessel
and so the delay in appearance of the pain
can be accounted for.
Case iv. (W.H.) Where there was a double
rupture there was no sign nor complaint
of pain at any time.
This delay in the onset of pain is the direct
opposite to the experience of Von Reck who states
that pain comes on soon with such intensity
as to produce fainting and an immediate
collapse and argues that its presence
distinguishes the lesion from the minor
one of contusion of the bowel but in these
cases until some time had elapsed after
the accident there was not sufficient pain
to warrant even the diagnosis of the minor
condition.
From these cases I am led to believe
that the pain is due not so much to
the injury to the bowel directly but
rather to a septic peritonitis following
such an injury and depending on the
extent and severity of the peritonitis and the
rapidity with which it develops. In
this connection it is of interest to notice
the length of the latent period in these
cases before the peritonitis developed.
The view that I take of the cause of the
pain is I think strengthened by the
fact that in Case VII. (W.H.) when no pain
was complained of there was also no
signs of peritonitis - the only inflammatory
condition being the congestion of the gut around
the site of the rupture.

In connection with this symptom it is of
interest to compare the following case with
the preceding ones.

Case V. Nov. 871.
A. M. male age 30 years.
Patient fell 40 feet scaffold accident.
Received fractures of radius and ulna of both
forearms. No other evidence of injury on
admission. An hour later he began to
complain of acute abdominal pain - general.
Abdomen dilated and walls absolutely rigid. Vomited slightly several times.


Exploratory Laparotomy performed - on ground that there was probably a perforation of gut. No perforation was found - no injury to bladder.

24 hours later - similar attack of acute pain - abdominal distension and rigidity. Pulse 120. Temp. 102°. Respiration 36 - 15 minutes later catheter passed and again pure blood drawn off from the bladder. No recurrence - and recovery complete.

This undoubtedly was a case of Rupture of Kidney and the passage of clot down ureter had produced a renal colic which simulatrd peritonitis and gave rise to the idea of possible rupture of the gut.

The rapid onset of the pain - and rapid distension of the abdomen - are held two facts which negative such a diagnosis -
Shock.

The absence of shock in all these cases is of great moment. In this matter one cannot but think that some authorities are wrong. Shock, according to Greig Smith, in the great majority of cases is present to a marked degree. (Abdominal Surgery, p. 1104).

None of these as mentioned previously states that the very acute pain produces immediate collapse. In perforation following upon disease—jaundice, duodenal, typhoid ulcers—shock is neither so early nor so universal a symptom as some would have us believe.

It is probable that the traumatism producing the rupture or the rupture itself paralyses the peristaltic movements of the bowel and that for some time, at any rate until reaction sets in, there is only a leakage of fecal contents proportional to the size and direction of the rupture. This absence of shock is all the more curious when we consider the large sympathetic nerve plexus contained in the abdominal cavity and intimately connected with the intestinal tract.

Undoubtedly the degree of shock depends to a
great extent on the temperament of the patient, and the consciousness of having received a serious or a possibly serious injury.

As a clinical clerk in Professor Annandale's wards I well remember a man being brought in who had been stabbed in the abdomen. His clothes were pierced and there was a superficial wound of the abdominal wall. No real harm had been done and yet the shock in this case was extreme and immediate.

On March 28th, 1903, in a League Association football match between Bolton Wanderers and Bury the Wanderers centre-forward was accidentally kicked in the epigastric region by an opponent. The pain at the time was so severe that he became unconscious. He was brought into hospital in a semi-unconscious state. His pulse was weak - and 104, per minute. Temperature 99°. Respiration normal and costal abdominal. His face was pale. Covered with cold sweat. His extremities were cold. Shock was extreme. This was treated and he recovered perfectly, in 4 hours. There was no lesion - no bruising - only a lacy mark where the boot had scraped skin.

From these cases and those of others it must be allowed that shock as an outstanding feature in cases of traumatic rupture of the gut has no real diagnostic significance. Pallor and Cold Perspiration noticed in some cases ought I think to be considered only as part of the shock and not as separate symptoms—and therefore their absence in my cases where there was no shock is only logical.

In Case 10 W.T. the patient was certainly pale but then he was suffering from concussion of Brain which although at some passed off was quite sufficient to account for the pallor.

Vomiting.

In Case 11-14 there was vomiting at time of or immediately after accident—but this was not due to the bowel injury but to concomitant circumstances—namely in Case 11—The man
had been drinking heavily up to the time of his accident: and in Case IV the vomiting was more than likely due to the concussion.

In cases i + iii there was no immediate vomiting so that if we consider that the vomiting in cases iii + iv had no connection with the injury to the bowel and this conclusion is a perfectly reasonable one - then the series shows that vomiting is not an early symptom in all cases of traumatic rupture of gut and indeed it may be and in some cases is entirely absent.

This conclusion does not agree with the experience of Greg Smith, who said "vomiting in the early stage is one of the most constant symptoms and where there is no vomiting there is usually nausea ... (p. 1103). Mayland does not express himself quite so strongly. He says that vomiting will not always a constant symptom is more frequent present than absent and often occurs immediately after the receipt of the injury.

Cases i, ii + iii all showed persistent, uncontrollable vomiting - becoming fecal in cases i + iii - but most until there were other signs of general peritonitis and this vomiting differed in no
way from the vomiting which is so frequently associated with peritonitis.
I believe then that this persistent vomiting which has been remarked at some time either in the early or later stages in cases of traumatic rupture of the gut is often peritonitis and ought not to be regarded as a special symptom of this injury but merely a sequence.

Elimination of liver dulness.
The importance of this sign as a means of diagnosis has been greatly over-rated by some authorities.
The sequence of events is probably as follows.
The injury which causes the rupture gives rise to some pain possibly to transient faintness.
this injury passes off quickly and as the gut is paralysed in the neighbourhood of the lesion the escape of either gas or faeces is but slow and gradual.
The escaping faeces do however quickly give rise to septic peritonitis as a symptom which a boardlike rigidity is usually prominent.
This holds the upper abdomen firmly down upon the liver and prevents in a certain number of cases the
disappearance of the lirnë dulnes until such time as its diagnostic importance is no longer of any value. At a later stage the peritonitic meteorism tues out the abdominal muscles, suffering from the devitalising general condition — the distension then restores the liver backwards and lifts the thin edge under the ribs, when it is difficult or impossible to define it from the distended coils below.

My 4 cases show this sequence:

Case i. There was no peritonitis. The bowel was simply paralysed — allowing no gas to escape consequent to the board-like rigidity; was absent — the abdomen presenting an unusual appearance — and lirnë dulnes was unaltered.

Case ii. Showed the next stage — here septic peritonitis had intervened — the board-like rigidity was prominent — and holding down the liver — it prevented its rotating and producing diminution in the area of dulness.

Cases i + iii where the further stage was seen — namely meteorism and distension — the liver was rotated, and dulness markedly diminished. It is conceivable that — sudden
escape of a large quantity of pan at the time of
the rupture either from the size of the opening
or other cause might give rise to an absence of
this dulness but for practical purposes nothing
can be clearer than that whilst its absence
is of importance yet the presence of lower
dulness is in the early stages no aid in the
diagnostic exclusion of traumatic or may
add even of pathological perforation.

The symptoms which one sees in traumatic
rupture of gut may apply to other
intra-abdominal traumatic lesions-
a fact which the two cases given below
substantiate.

Case vii by 831.
J.W. male age 34.
Admitted into Hospital at 8.30 a.m. with
history of having been run over the body by
a hansom. Patient was cold and
shivering. Pulse 90. Temperature 97° F.
He complained of pain on left side, over
lower ribs in front - also of pain in
eyepaumium. There was mitudistraction
no distension of abdomen - no diminution of
lower dulness. Vomited soon after admission but with
any great extent.

At 12.30 a.m. 4 hours later - pain in epigastric region more acute - pulse 140 per minute. Temperature 98.6°. Still vomiting slightly, livers dulness normal - slight distension of abdomen.

4 a.m. 8 hours after admission - Pain in epigastrium extremely acute - pulse 140 - Temp 99.4. Sweating freely - vomiting frequently, almost pure bile. Passed flatus and urine still slight distension.

10 a.m. 14 hours after admission - pulse 130 and weak. Temperature 98.4. Acute pain in epigastrium - patient so pale but not cold nor clammy. Very restless and thirsty. Vomiting frequent and darker. Flatus passed distension and abdominal rigidity marked. Liver dulness diminished by two inches - Patient lying with both legs drawn up.


4 p.m. Vomiting faecal - distension rapidly increasing - liver dulness absent - Full fluid on percussion in both flanks - Examination per rectum - showed bulging in pouch of Douglas.
6 p.m. abdomen opened. Abdominal cavity filled with clotted blood - dark - evidently been lying a abdomen for some hours. Watery to viscera. Tear was found in mesentery about 1½ inches from the gut - with rupture of blood vessels - and from these the haemorrhage had come - about one foot of gut supplied by these vessels - was very dark and faeculent.

Starting.

Death 4 hours later.

The fact that each branch of a mesenteric artery is itself an "end artery" has been drawn attention to & conclusively proved by Collin and Burgen in an article on 'Substitution of an intestinal branch of the Superior Mesenteric Artery' (cited: Medical Chronicle. Fourth Series, Vol. III, no. 5, page 295).

They maintain that the case recorded shows conclusively that occlusion of a single "intestinal" branch is sufficient to bring about haemorrhagic infarction of intestine.
Case VIII. No. 405. Rupture of Liver.

H.R. Male, age 40.

Patient fell 7 feet on to a girder which struck him across abdomen and then he had a further drop of 15 feet to the ground.

He was picked up in an unconscious state but soon recovered consciousness. Vomited morned. Admitted 3 p.m. an hour after the accident. There was nothing to indicate that he had had a serious injury. Pulse 80. Strong and steady. Temperature 99°F. He complained of some slight pain and tenderness on right side over lower ribs in front. No other symptoms or signs.

5 a.m. 14 hours after admission. Patient suddenly collapsed. Pulse 130. Temperature remained 99°F. Recovered quickly after hypodermic injection of Staphyline 50 cc. Nothing to be made out. Neither rigidity nor retraction of abdomen. No pain more than before.

6 a.m. vomited for the first time since admission. Vomited matter was foul. He still complained of pain over ribs also tenderness but not to any marked extent. There was slight distension of abdomen and abdominal movement during respiration was slightly restrained.

10 a.m. Abdomen opened. Cavity filled with large quantity of blood clot which had come from a vertical tear in right lobe of liver.

6 a.m. 26 hours after operation. Death from collapse following shock.
Infanilating appendicitis. Case 1. No. 479.
E.R. female, age 14 years. Previously healthy—suddenly seized child.
walking with acute pain over stomach accompanied by vomiting. Both pain and vomiting nearly subside. Following day there was a recurrence of acute pain over stomach—sudden sharp attack followed by collapse. Admitted into hospital an hour after this attack. Pulse 110. Temp. 101.6°. Complain of acute pain over stomach—Examination of abdomen showed absolute rigidity of abdominal muscles. Abdomen was retracted and board like. It was considered to be perforated Gastric ulcer. Abdomen opened in middle line above umbilicus—Stomach found to be healthy. Appendix extended downward. Ascending colon found lying near middle line—no mesentery—Appendix was removed and
perforated near the base. Abdominal cavity contained a large quantity of foul smelling fluid. This was removed by cœliotomy. Death on 6th day from exhaustion and septic peritonitis.

The interesting point about this case was that it simulated closely perforated gastric ulcer.

Case 77 - ho 1250.

J.K. male, age 29 years. 5 days before admission patient was suddenly seized with vomiting and abdominal pain not localized. Treated by his doctor at home by poulticing. 2 days later as there was no improvement another medical man was called in. He found him suffering from acute abdominal pain which was not referred to any special part. Pulse was fast, temperature only slightly raised. He gave him a hypodermic injection of morphia and ordered a simple enema. Pain was lessened and there was a slight movement of bowels. Following morning he was extremely collapsed and faecal vomiting had started. He was then sent into hospital.
On admission - he was conscious - complained of only little pain in Right iliac fossa. The abdomen was considerably distended - Pulse 120 - Temperature 100. Extremities were cold - clammy - face slightly cyanosed. Preparing abdomen - appendix was found to be perforated - abdominal cavity contained large quantity of foul fluid.

Death six hours later.

Case III. No 1009.

Ct. female - 12 years.

Patient healthy up to 14 days before admission. She then began to complain of pain in right iliac fossa - unable to take her food.

Bowels constive - slight motion after dinner.

7 days before admission - she began to vomit increased in frequency - at first it was greenish in colour - 5 days later it became faecal.

During all this time pain continued but from being localised to right iliac region it became general.

During the 48 hours prior to admission vomiting was faecal - persistent and her friends describe it as "pumping it up".
During this 48 hours there was no movement of bowels.

Pain was most acute on 5th day before admission - especially felt in loin and right side.

On admission Patient was pale. Breath had a fecal odour. Tongue was dry. Brown - pulse 120 - feeble regular. Temperature 100.2°.

Extremities were very cold. Examination of abdomen showed great distension especially in epigastrum - absolute refusal to move - veins Tended on palpation all over. Peculiar gristle was hyperactive.

She was transferred at once, but died an hour later.

Post-mortem examination -

Appendix was found to be perforated - also general septic peritonitis.

Case No. 1007.

J. F. male age 21 years.

5 days prior to admission - Patient was seized with a sudden pain in abdomen whilst at work. He was seen to stumble suddenly - put his hand to abdomen. He was taken to Hospital attached to works
and remained there until day of admission into infirmary.
When admitted he had general peritonitis. Abdomen was distended and rigid.
He was much collapsed - extremities were cold - He vomited frequently, a dark green fluid.
  There was constant hicouph.
Temp. 98.6°. Pulse 120.
Operated in 3 hours later - appendix was found gangrenous and perforated - There was general peritonitis.
  Death 12 hours later.

Case V. No. 926.
J.P. male. age 34 years.
4 days before admission he felt perfectly well. Suddenly at mid-day seized with acute general pain in abdomen. He
vomiting at the time but he had a watery
motion.
The following morning he began to vomit.
Vomited twice within first 24 hours.
3 times within 2nd twenty-four hours.
but on following day vomit was frequent
persistent because fecal.
On admission he complained fecal
abdominal pain - not localized. There was
disruption and rigidity of abdomen - hands
were cold and clammy - and he was in
a collapsed state.
The abdomen was opened and appendix
found perforated - septic peritonitis.
Death 9 hours later.

Case VI. No 611.
R. R. male. age 20 years.
Two days prior to admission bowels freely
 evacuatie - no motion since.
Shaatly before evacuation of bowels - patient
complained of sudden acute pain two hours
to left of umbilicus - passing to right
iliac fossa. - This pain became general.
Pain accompanied by vomiting which
persisted and 4 days later became faecal.
There was a previous history of illness where
marked feature was pain in right-iliac
fossa.

On admission -
Pulse 132. Respiration 32. Temperature 100.8. 
He complained of acute pain general over
abdomen - worse on pressure in both iliac
fossae - vomiting faecal.
Abdomen was distended and rigid - he flatus his faeces passed.

Patient was so collapsed that operation was postponed - death 20 hours later.

Post mortem examination:

General peritonitis - pus in both flanks.
Appendix - occluded by concretion - gangrenous and perforated at apex.

Age 36x.

Appendicitis generally occurs more frequently among males than females and only cases of the fulminating variety are no exception to this rule, four of them occurring in males and two in females.

As regards age - the two cases in females were in young girls of 12 and 14 years of age respectively - and the four males between 20 and 31. Appendicitis under 15 years of age is not so rare a condition as formerly thought. The greatest number of cases being seen in patients between the ages of 10 and 30.

Practically all my cases come within these two decades - Case 47 being the only one over 30 and as he was only 31 may be legitimately included.
Symptomatology.
The rule in this class of case is that there
are no premonitory symptoms - the patient
showing a most grave and so far as my
cases were concerned a hopeless condition
almost from the onset of the attack.

One case certainly was an exception:
E.R. (Case III) - This girl apparently had an
inflammatory condition of appendix for 7 days
but not so severe as to cause any adhesions
to form around the appendix, so that when
the fulminating condition arose, she was in
no better condition for resisting this very
fatal disease.

Pain.
Pain is always very severe. It is generally
the first symptom in this disease.
It is not localized - it may stimulate fasting
nerves as in E.R. (Case I). It is as a rule
general all over abdomen - but may be
intensified over appendix.

In all probability, although pain is the
first symptom recognised - there is
previously an acute inflammatory condition
of appendix - and that only when the
peritoneum becomes involved do we get the pain. If so, it is not at all to be wondered at - that the pain is general, being referred to other parts of the peritoneal surface. On account of the intimate relation of the nerves supplying the peritoneum - moreover the very rapid extension of the peritonitis may account for the "increasing general pain".

Vomiting.
This symptom appears with the pain or at most shortly after it. This initial vomiting is most probably reflex due to the peritoneal irritation. Later - the general peritonitis causing general paralysis of the gut - the initial simple vomiting gives place to a persistent copious vomiting - ultimately becoming faecal.

Collapse.
Collapse is considered by authorities to be an early and prominent condition in fulminating appendicitis - so far as my cases go only two - (Cases 7 and 11) showed this in the initial stages.
The pulse in every case was never under 116 per minute and was always weak, but but the collapse was not equal in all. In case 1, pulse was 116 - Case 7, 120. and in three cases the collapse was early and marked but in the other cases where the pulse varied from 120 to 750 - the collapse was not at all marked until some time had elapsed - and this might be as much due to the excessive strain of persistent vomiting and the acute pain of general peritonitis as it was to the severe local lesion of the appendix.

Also the question of temperament is a factor which has to be considered.

His tension.
In all my cases except Case 7 - distension when first seen in Hospital was marked. C.R. (Case 7) was admitted almost immediately, after the perforation and in this case there was no distension - but board like rigidly. In all probability this is the rule in all cases - first rigidity and later distension after the abdominal muscles have become tired out. 

Cp. Remarks on this subject in Section on Traumatic Rupture of Gut.
Haltis and faeces.

The rule in these cases is to have retention of both halitis and faeces. There may be a slight movement, as in Case 75, after attack has begun if a simple enema be given — but this is probably only an emptying of contents of rectum and is not uncommon in acute obstruction — for example in a strangulated external hernia by enema we may get once a good motion but repeating enema there may be only a poor or even no result. The fact is merely an emptying of lower bowel and so far as rest of gut is concerned it is still obstructed.

The following two cases present symptoms analogous to acute perforative appendicitis and require to be differentiated from it:

Case vii. No. 762.

J.D. male; age 19 years.

The boy began to complain 7 days before admission of frontal headache and drowsiness during the following four days this continued but in addition he also suffered from
diarrhoea and vomiting of stomach contents.
Two days before admission he complained of acute abdominal pain - especially in left iliac fossa - shooting down into inguinal region on the same side.
He became collapsed - face pale - sweating extremities cold - Pulse quick - abdomen slightly distended. There was vomiting but it was not faecal. Opium was given.
Following day - abdomen was not so tense there was no pain but tympanites was present.
On day of admission - vomiting was faecal pain very acute and localised in left iliac fossa. Abdomen distended and rigid.
Abdomen opened - perforation found in last foot of ileum - closed - death an hour later.
Post mortem examination:
Seat of lesion was in last foot of ileum - Patch of lymph seen over this part of the gut. Near this - caecal valve there were several Typhoid ulcers - one of which had perforated and others were on the point of doing so. Again there were others where the destruction of tissue was not so great. There was also general peritonitis.
Case VIII.  No. 690.

J.C., female, age 40 years.

Patient was admitted in a collapsed condition with a history of faecal vomiting for 24 hours no flatus nor faeces passed during the same period.

There was long previous history of constipation. Patient had been ill at home under the care of a doctor for a week. Diagnosis made was appendicitis but previous attack on admission she complained of acute pain in right lumbar region and this area was tender to touch and press dull note on percussion.

Abdomen was opened in right iliac region.

Caecum was very much distended lying behind it was a cavity containing faeces and communicating with the gut on opening cavity there was a free discharge of faeces and flatus.

Communication between gut and the cavity was due to perforation of chronic faecal ulcer of caecum.

Patient died 12 hours later.

Permission for a post-mortem examination was refused.
as previously remarked - these cases have several points similar to acute perITative appendicitis.
The age in J.B.'s case (typhoid elevation) is below the usual age of perITative appendicitis.
It might be thought that the Typhoid perforation ought to have been easily diagnosed but Typhoid fever often shows most anomalous and misleading symptoms.
The case was not considered by the medical practitioners to be typhoid until day 8 admittance. Still the fact that he had been suffering from an intestinal irritation of a subacute type for 5 days before more acute symptoms showed themselves would be against diagnosis of acute perITative appendicitis.
The previous history in J.B.'s case of chronic constipation although it could not aid in excluding perITative appendicitis would put one on one's guard and prevent a dogmatic diagnosis.
The pain in J.B. was localised in left iliac fossa and had no special relation to site of perforation - nor could it give any clue to the diagnosis.
In J.C. pain was localised in right lumbar region - over a localised swelling.
The pain being in both cases localized and not general in my opinion is an argument against perforative appendicitis - where pain is not localized but almost invariably general. Vomiting in both cases is similar to perforative appendicitis but the collapse after severe symptoms showed themselves sooner marked and earlier.

Obstipation in J.B. was similar to fulminating appendicitis - but in J.C. it was not general but localized over caecum.

Retention of flatus and faeces in both cases are symptoms of any acute - or chronic becoming acute - intestinal obstruction.

In my opinion the differential diagnosis must rest more on the previous history and premonitory symptoms than on any symptom arising after perforation.
Perforated Gastric Ulcer.

These cases of perforated gastric ulcers are included in this thesis as an account of the symptoms of acute abdominal trouble which they in common with the preceding cases present.

Case 7: No. 524.

Mr. H., female, age 34 years.

Previous history of gastric ulcers for some years. Patient was suddenly seized with acute pain over region of stomach accompanied by vomiting. Vomited only once - pain soon subsided - there was no collapse.

3 hours later another attack of acute pain in same region - this time unaccompanied by vomiting. But the collapse was prominent.

On admission temperature was 101.9.

Pulse 112, weak, regular.

Abdomen rigid - slight distension - gradually increasing. Acute pain complained of in epigastrium - aggravated by pressure.

Patient collapsed, extremities cold.

Operation: perforation of stomach found in anterior surface - closed.

Death: 5 days later caused general peritonitis.
Case II. No. 668.

M. H. female. age. 18 years.

Previous history of Dyspepsia. no definite history of gastric ulcer. no Haematemesis. has complained of acute epigastric pain.

3 days before admission patient was suddenly seized with acute epigastric pain. no vomiting at time. Pain subsided until following day. When again seized with acute pain - worst in upper abdomen but more or less general. Vomiting also began and became frequent. it was fecal. No movement of bowels since illness began.

Admitted following day.

On admission. Temperature 100.6. Pulse 88 but very weak. There was marked prostration. Extremities cold. Auricular depression. Breath has fecal odour. Abdomen markedly distended. Respiration purely thoracic and at rate of 40 per minute. Percussion note tympanic. Liver dulness decreased. extends to within two inches of costal margin in nipple line. Acute general pain more marked in upper abdomen.

Operation. Preparation anterior wall of stomach.
found - closed.
Death 36 hours later - from general peritonitis.

Case III. No. 278.
A.B., female, age 20 years.
Previous history of gastric ulcer for two years.
36 hours before admission - patient was suddenly seized with pain in lower abdomen, spreading to epigastrium. Soon subsided.
Six hours later, pain came on again, accompanied by vomiting - pain continued all night.
Admitted to Hospital following morning.
On admission - patient was in a collapsed condition. Temperature 100°, pulse 112.
On percussion - note was tympanitic - liver dulness absent.
Operation - perforation found - on anterior surface of stomach - closed.
Death 12 hours after admission.
Case IV. No. 119.
E.B. female. Age 23 years.
Previous history of gastric ulcer - duration uncertain.
Patient was suddenly seized at 7 p.m. with acute pain over stomach. This rapidly passed off. No other symptoms.
No rigidity of abdomen.
Admitted into Hospital 9.30 p.m. of same day for observation.
10 a.m. following morning - she again complained of acute pain in abdomen. It was general.
Abdomen was slightly distended but still moving with respiration. Rapidly became more distended and rigid. Pulse became weak.
and fast. 112 per minute. Temperature 100.4°.
Respiration purely costal. She vomited once dark brown fluid. Extremities were cold.
Operation 11 a.m. Perforated gastric ulcer was found on anterior surface of stomach. It was closed.
Result - death 12 hours later.

Case V. No. 1059.
L.A. female age 19 years.
Previous history of gastric ulcer for two years.
For several days before admission, patient had not been feeling well and had been living on a fluid diet.

On day of admission at midday she was suddenly seized with acute pain over stomach. She went to bed, pain subsided, and she slept until 4.00 p.m., woke up then with acute general pain in abdomen, which rapidly became more severe at 5.00 p.m. She was seen by the doctor. She was then in acute pain. Abdomen was rigid, not very much distended. Tenderness in periumbilicium.

Pulse 120. Severe sweat. Patient was in a state of collapse. Temperature 97.4°F. at 6.00 a.m. Operation - perforated ulcer found on anterior wall of stomach. This was excised. Stomach cultured.

On account of previous diet there was little in stomach, and very little escape of contents into general peritoneal cavity.

Result - uneventful recovery.

Case VII. W & 19.
S. J. F. female, age 21 years.
Previous history of Duodenal ulcer 12 months.
on waking prior to admission - P. was suddenly 
seized with acute pain in upper abdomen 
over stomach - vomited once soon after onset of pain 
no blood in vomit.

Following day pain came on again - similar 
condition as on day before - so she was sent 
into Hospital. 

on admission Pulse 130. T. 99. she complained 
of slight pain over stomach - no abdominal 
tenderness. Pain became easier during the day. 
next day Pulse was 140. Temperature 101.9. 
Abdomen was generally distended - more tympanic 
all over - liver dulness somewhat decreased 
She had no pain. 

in evening of same day - pain again became 
acute. Temperature 100.4. pulse 128. No 
vomiting except once after some milk. 
It was decided to explore stomach. 

Punctured gastric ulcer was found in anterior 
wall of stomach. Extravasation of contents 
into general peritoneal cavity. 
Death 48 hours later.
Age and Sex.

The great majority of patients who suffer from peptic ulcer are of the female sex, and my cases do not differ. They were all young women - their ages varying from 18 to 24 years - all but one were under 30 years of age.

Symptomatology.

In all cases there was a previous history either of gastric ulcer or some other stomach disturbance.

Pain.

Pain in my cases is the first and prominent symptom. It is always acute and comes on without previous warning or rather without any immediate warning.

Pain in all my cases did not increase in intensity at first - but on the other hand became less and even subsided all together after a variable period - never less than 3 hours and often as much as 12 hours later - it again manifested itself with this difference that whereas at the first onset it was localized to the upper abdomen and particularly to the epigastrium - when u-
received it was more diffuse and general over whole abdomen.

Vomiting
This is not a prominent symptom. The initial pain is often accompanied by vomiting but this does not occur as a rule - more than once and generally at the time of the pain or soon after.

Later, when symptoms of acute peritonitis are manifest - vomiting recurs frequently and may be preceded as in two of my cases - but during the time between the initial pain and the manifestation of the peritonitic symptoms there was as a rule no vomiting.

Collapse -
at the time of the initial pain - when in all probability the perforation takes place - there is in my cases no sign of collapse. Collapse does not come on until peritonitis has become advanced. The same remarks apply to the pulse - at the time it is faster than normal but not weak. The rapid, weak pulse described in text books is
really not the pulse at the time of perforation but the pulse in later stages of the condition.

Distension and Rigiditi.
These signs are also late manifestations and may come on from four to twelve hours after perforation—certainly in my cases—none of them showed either sign at the time.

If Rigiditi does occur at the time—or so soon after as to consider it synchronous with the perforation—then it is a localised rigiditi— and it is a localised to the angle between the two sets of ribs. It is all probability reflex from the stomach and is Nature's attempt to maintain the stomach at rest. Her first care in the healing process.

Rigiditi (general) is one of the surest and earliest indications that a serious lesion has taken place—it comes on as a rule before the distension—and in my opinion ought in cases like these—where there has been a sudden acute attack of pain a few hours previously to be taken as a signal that operative interference
is urgently demanded. The rigidity of the abdominal wall at first contains and to a certain extent prevents the distension - but the abdominal muscles become tired out - they relax and distension rapidly increases.

The following two cases present symptoms so much like those seen in perforated gastric ulcers - as to warrant them being recorded.

Case VIII. No. 294.

M. a. P., female, age 25 years.

For five weeks, patient had complained of sickness and vomiting coming on about 3 hours after food. Vomiting accompanied by pain over stomach - no pain at any other time.

For last two weeks, she had complained of feeling of distension and pain coming on immediately after food. No other symptoms on day of admission - she was suddenly seized with acute pain in epigastrium accompanied by vomiting - stomach was empty and vomited matter was merely of a mucous nature. Previous meal 2 hours before.
Pain + vomiting lasted only a short time - leaving her with a tired feeling.

On this history she was admitted into Hospital.

There were no symptoms of perforation of abdominal alimentary tract.

In the evening - about six hours after admission, she complained of some pain in lower abdomen but there was no repetition of vomiting.

Temperature normal on admission rose to 100° F in the evening - Pulse 80 per minute.

24 hours later - patient suddenly collapsed.

Temperature dropped to 96° F - Pulse 120 per minute - weak + running.

She was cold + clammy - complained of acute pain in right iliac region - abdomen not distended but rigid.

From a stomach lesion - the opinion was changed to a lesion of appendix vermiformis - probably a perforation of that organ.

Abdomen was opened over appendix - intestine were found matted together - cavity was opened containing a reddish colored fluid + no perceptible odor.

Death 5 hours later.

Post mortem examination.

Perforated ulcer of 2nd part of duodenum was found - contents had trickled through into kidney pouch - over that down by outside of ascending...
esophagus into right side fossa - and to into general peritoneal cavity.

Case VIII. No. 1482.
J.T. male - age 42 years.
Previous history of dyspepsia for several years.
Patient was suddenly seized with acute pain in abdomen over stomach. Pain passed off in an hour.
On admission - an hour later - Temperature was normal - pulse 120 - Respiration 30 per minute.
Mainly costal but abdomen was absolutely rigid.
Complained of pain over stomach - not very acute - aggravated on pressure - liver dulness not decreased - no abdominal distension.
Torso was covered with thick, dark brown pus giving me the idea that this was rather a chronic than a suddenly acute condition.
Patient had an anxious expression - and the extremities were cold.
Two hours later abdomen was opened - no perforation of stomach found - but many adhesions between stomach and neighboring viscer.
Temperature an hour after operation was 102°.
Pulse 90 - Temperature remained high and pulse rapidly became quicker, weaker.
Pulse was as rapid as 168 per minute with
Respirations 48
Death 48 hours after operation.
Post-mortem examination.
Nothing more found than described at operation.
Differential Diagnosis.

Although as Treves points out in his Lethasian Lectures on Peritonitis—albeit acute troubles in abdomen commence with the same train of symptoms—yet although many points in these series of cases are common to all—yet there are others which may help in the formation of a definite diagnosis.

Age—
Intussusception is more often found in children below 10 years of age and is therefore essentially a condition of infancy and childhood.

Perforative appendicitis has a wide range—occurring in children above 10 extending into adult life—but not often seen in persons over 35 years of age.
Perforated Gastric ulcers—generally occurs in young adults and adults up to 35 or 40 children not often being affected.
Internal strangulations have the widest range of all occurring in children above 10 years of age—giving way to middle life.
Traumatic perforation has of course no relation to age.
Intussusception is generally seen in male children.

Intestinal intussusception is equally divided between both sexes although as previously remarked intestinal intussusception by Rickert's duodenum is more often found in males.

Perforative appendicitis of fulminating variety is more often seen in males than females.

Perforated Gastric ulcers is generally confined to females.

Pain-

In Intussusception - pain has sudden onset - continuous at first - but later intermittent.

Internal intussusception - pain sudden and continuous.

Perforative appendicitis - sudden. acute at first may be localized - not necessarily to appendix may be stomach or indeed any area - but later it becomes general.
Traumatic Perforation of Gut - his real pain at time of accident but later when peritonitis has set in then pain which is general.

Perforated Gastric Ulcer.

Pain at time of perforation - acute and localised over stomach - then period of quiescence few hours later pain when peritonitis has developed.

Nausea and Vomiting.

Internal Strangulation Perforative Appendicitis have initial simple vomiting. This does not subside but increases in frequency and late becomes faeculent.

Intussusception and Traumatic Perforation.

There is no immediate vomiting but later it comes on and persists.

In intussusception vomiting may begin although not within pain yet very soon after it.

In gastric ulcer - there is initial vomiting followed by no vomiting until several hours have elapsed then it may recur with characteristics of peritonitis vomiting.
Evacuations.
Complete suppression of feces and flatus is characteristic of internal strangulation and also intussusception - with this difference that often in intussusception we get blood and mucus evacuated. This does not occur in internal strangulation.
Evacuations may be suppressed in perforative appendicitis and perforated gastric ulcer but not necessarily so until peritonitis has advanced.

Meteorism and Tenesmus.
Tenesmus at present is often an aid to diagnosis of intussusception.
Meteorism is seen early in internal strangulation and later in perforative appendicitis.

Differential diagnosis also depends on previous history - e.g. history of trauma, gastric ulcer, previous attack of peritonitis.
Summary of Symptoms:

Intussusception:

1. Sudden onset of acute pain during perfect health, continuing for a time but becoming intermittent.
2. Nausea + vomiting - appearing not with the pain but shortly after it. Vomit simple at first, but if disease prolonged becoming faecal.
3. Haemorrhagic evacuation of blood and mucus.
4. Retention of flatus + faeces.
5. Tumour - may be absent, of present felt through abdominal wall or per rectum.
6. Tenesmus and melorrhoea more marked in later stages.
7. Condition seen in early childhood and infancy - particularly males under 10 years of age.

Intrauterine Strangulation:

1. Melorrhoea - early and marked.
2. Retention of flatus + faeces. No haemorrhagic evacuation.
3. Pain - acute sudden and severe, continuous.
4. Vomiting and nausea from beginning - initial vomiting non-faecal, later becoming faecal.
5. Occurs in adult life or either sex.
Traumatic Rupture of Gut.

1. History of trauma - may be no symptoms at time - symptoms come on 3-24 hours later.

2. Pain -

3. Shock - may be absent.

4. Vomiting - becoming persistent.

5. Resin dullness - may be decreased absent or not alleged.

6. Peritonitis.

Fulminating Appendicitis.

1. Occurs more often in males between ages of 10-30 years.

2. No previous symptoms.

3. Acute sudden onset of acute pain - pain may be general or localized to any area.

4. Pain accompanied by vomiting.

5. Retention of fluids and feces.

6. Rigidity without distension - followed later by abdominal distension.

7. Collapse may or may not be present.
Pregnant Gastroenteritis

I. Occurs in females between 18 and 35 years.
II. Previous history of gastrointestinal disturbance.
III. Sudden acute pain followed by period of pain and recurrence later.
IV. Vomiting, often slight, at first, of all food eaten, later stages.
V. Distension rigid, coming on gradually.
VI. Collapse becoming marked as other symptoms show themselves.
VII. Puerperal.

Site of Exploratory Incision in Emergency Abdominal Cases.
The term "Exploratory Incision" indicates ignorance of the condition present; but the indistinguishability of the symptoms often raises great difficulty in determining even approximately the nature of the case, and under these circumstances an exploratory incision is not only justifiable but often urgently demanded.

For some reason or other - the site chosen is almost invariably in the middle line either above or below the umbilicus. From a study of these cases
I am convinced that in a majority of cases this is not the proper site.

Of these 40 cases, 3 cannot be taken into account — viz. Case of Hydralic S aureal Vomiting — Obstruction due to retroverted uterus and Case of Rnal Colic Stimulating Rupture of Gut.

From the remaining 37, I wish to subtract 8 cases where there was definite history of gastric trouble leaving 29 cases. Of these 29, 23 would best have been reached by an incision in the right linea fossa and only six where a median incision would have been preferable.

From these facts — I conclude — that when there are no definite indications of gastric trouble — the proper site for an exploratory incision is not on the middle line but in the right linea fossa as — all probability — with the above exception 70% of all cases requiring an emergency abdominal operation have their origin in that region.
Conclusions.
The untoward results in this series of cases merits serious attention.
This indeed it was that first led me to a study of this question: for the general practitioners in provincial towns must rely on the surgical skill of his colleagues on the staff of the local hospital; and the published statistics of the results in grave abdominal catastrophes are absolutely no guide to him in considering the question of prognosis in a given case.
The great mortality as compared with that given by authorities is due to a variety of causes.
1. Absolutely all cases are included.
There is no doubt whatever that the statistical method as stated in textbooks etc. suffers largely from this cause.
2. The general practitioners in this neighbourhood is still disinclined to submit his patient to operation until the favourable moment for interference has passed.
To what extent this is due to a distinct lack of the operative skill of the junior staff.
3. These patients are all severe cases. No cases in private practice are included. The added shock of removal, with its attendant grave disturbances - both local and general - is very great. Many patients who, when seen at home by the general practitioners, appear to be in a fairly good condition, are found on their arrival at the institution to be in a condition which makes operative interference a forlorn hope.

4. Almost all cases of obstruction have been operated on - no matter how bad the patient's condition might be. No doubt a respect for his statistical results would in many cases have decided the surgeon to abandon the patient to his fate.

5. The cases have been operated on too soon after admission. Speaking generally, it is without doubt advisable that the operation should be performed at the earliest possible moment; but anyone
who has seen many cases of acute abdominal trouble come into hospital where the condition is at all advanced must have noticed - as mentioned in paragraph 3 that the disturbance and exposure of removal have greatly lowered the vital power.

In my opinion it is in nearly all cases advisable to employ the time immediately succeeding his arrival in an endeavour to bring about some degree of reaction. A patient with pinched face - cold extremities - normal or but slightly raised temperature - pulse over 120, with faecal vomiting and increased distension is in absolutely the worst possible condition for operation conceivable.

Hot bottles - copious hot enemata - followed by stimulating injections with use of hot bottles - Bankati etc: the washing out of the stomach and other means too well known to need recapitulation - will in the course of an hour or so often work a marvellous change in the patient's condition and may in a case turn the scale in his favour.
In addition the delay affords an opportunity of obtaining the following:
6. The majority of these patients are sent into hospital by outside practitioners without or with only the briefest of notes. The patient himself shocked, collapsed can give no information of value and that given by his friends—ignorant, hurried—having to be extracted by leading questions is of hardly greater moment. In consequence the incision is often made with the surgeon almost wholly in the dark as to the nature and site of the lesion—a careful watch by the bedside with palpation rectal or vaginal examination, percussion, auscultation etc. with examination of the stomach, washing and the result of lavements—as regards quantity, injected and returned and character and state of contents of bedpan will especially in a patient recovering from collapse yield the information required.
7. The tendency in these cases is to work with too small an incision. There is not only a subconscious fear of hernia—but also the difficulty—an important factor with partially trained assistants—of keeping
back the distended intestinal coils.

As Jacobson says - in these cases the question of subsequent hernia of the scar is of altogether secondary importance to the saving of the patient's life - and my observations have led me strongly to the belief - not only in operations of emergency but also in those of selection that one of the penalties paid by the patient for the employment of surgical skill short of the best is exactly this greater risk of subsequent hernia - owing to a larger incision being necessary.

8. The besetting sin of the inexperienced operator is his attempt to do too much. Than Grey-Smith no surgeon has obtained more satisfactory results in the class of cases under consideration and throughout his teaching - the invariable remark is "do as little as possible consistent with immediate relief."

The attempt to do text-book operations in cases no two of which are alike and in which the general condition varies even more than the local inevitably leads to disaster.

A colostomy or an enterotomy with immediate opening and copious washing of the bowel will
often give immediate relief and tide the patient over the acme of the crisis. Where a thorough and prolonged search will merely hasten the end.

This it is which more than all else is responsible for the mortality in these acute abdominal cases.

9. Too long a time is taken over these operations. This no doubt is bound up with the attempt to do too much but beyond that there is a want of faith in the recuperative power of the peritoneum and the surgeon attempts much that might well be left to nature.

Were this mortality merely of local occurrence its importance would also be local and the main hope of improvement would lie in a change in the personnel of the staff; but an inspection of the annual reports of provincial hospitals in which similar conditions obtain—that is in hospitals with 100 or less beds serving upwards of 100,000 population—shows that the mortality is as great there. In the aggregate these hospitals serve the bulk of the population of this country and
I believe that the cases and results adduced in this Thesis form a more reliable guide to the present state of the diagnosis and treatment of these conditions than is to be found in any published work on the subject.

That the result is disheartening not to say appalling all must allow.

But progress is not made by blindly ignoring the facts - and I believe that improvement is to be looked for only by impressing that upon those who constitute the majority - the general practitioners of the country - that an early diagnosis followed by bold treatment lies the only hope of success.

I would say that in an abdominal case where the symptoms are more acute or the general condition is worse than the signs and history account for - that the patient is afforded the best chance by an early exploratory incision.

Undoubtedly this would lead to a certain percentage of unnecessary operations, but on the other hand we should be spared the record of unvarying failure put forward in the foregoing pages.
This consummation can be brought about only by the fearless determination of the general practitioners to insist upon the patient following the advice of those best fitted to judge. In too many cases his advice is flouted, and in some the sequel shows operation would have been unnecessary — or so it appears to the lay mind — and the practitioner suffers in consequence. This is what the general practitioners fear, and the suggestion of operation is deferred and finally put forward in a tentative manner until it is only after 24 to 48 hours of urgent acute symptoms that the patient consents to avail himself of surgical aid.