A Study of Appendicitis in General Practice, with An Analysis of Thirty Six Cases.

J. D. R. Munro, M. A.,
M. B. & Ch. M. (High Commendation)

17 Queen's Gardens,
Muswell Hill,
London. N.

September 1901.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

Scope of this Treatise.

The purpose of this thesis is to put together the notes of cases of Appendicitis which the writer has met with during his nine years' experience of medical work, and to set forth in detail the ideas he has formed from his reading and from that experience, in regard to the diagnosis and treatment of this affection. The subject is one of particular interest to the general practitioner, inasmuch as probably in no other disease he has to treat is there so much variety in the course it takes in different individuals, — and in the same individuals in different attacks — and more uncertainty throughout as to what will be the ultimate result of each case. An attack which begins with extreme violence may rapidly subside, and the patient be convalescent within a very few days, and on the other hand an attack which begins mildly may ultimately assume the most dangerous aspect and the patient die within a very short time. Cases of Appendicitis therefore present us with some of the most difficult questions we have to consider, and the writer has formed nothing more trying in his professional life than to decide the proper moment in the treatment of such cases to call in surgical

Anatomy of the Caecum and Appendix.

References:-

(A.) Quain's Anatomy, ninth Edition Vol. II page 614.

assistance. Having therefore had frequent occasion to contend with these difficulties, it is the writer's intention in this thesis to make special reference to the views he has come to hold regarding treatment in the early stages of the disease, and the question of deciding the time for surgical interference, if any be necessary.

In order to make this dissertation more complete it is proposed first briefly to sketch the anatomy of the Caecum and appendix, then rapidly to discuss the pathology of the various forms of the disease, and then treat it from a clinical point of view. A classification of cases will be made with the help of reference to various authorities on the subject. A case illustrating each class as typically as possible will be given in detail from the writer's own experience; unusual or atypical cases will then be cited, and later on the questions of diagnosis and of treatment will be fully discussed.

Normal Anatomy. (4) The Caecum is that portion of the large intestine which is situated below the entrance of the ileum at the ileo caecal valve. In length it usually measures about 2½ inches while its diameter is about the same. The comparative anatomy of this

Structure of the Caecum.

References:-

(A.) Huxley - Anatomy of Vertebrated Animals, page 304.

organ is interesting, inasmuch as in man its degree of development is intermediate between that found in herbivorous and in carnivorous animals. In the former the Caecum is sometimes of enormous size, as for example in the horse,(4) in which the volume of this organ is more than twice that of the stomach. In the carnivores on the other hand the Caecum is frequently absent, and if present is always a mere rudiment.

In <u>structure</u> the Caecum resembles the remainder of the large intestine. In connection with this paper perhaps the most important point to notice is the arrangement of the longitudinal muscular fibres in its wall, which form three flat bands, each about half an inch in width and half a line thick. They commence upon the caecum at its junction with the vermiform appendix and extend from that point upwards on the ascending colon. As will afterwards be pointed out, the anterior muscular band is frequently of service during operations on the appendix, as it passes into direct connection with the muscular fibres of the appendix, and enables the surgeon to determine the position of that organ.

Position of the Caecum.

Embryology of the Caecum and Appendix.

References:-

(A.) Quains Anatomy. Ninth Edition. Vol. II page 881.

The position of the caecum is variable. It is usually to be found lying on the psoas muscle with its extremity reaching just over the border of that structure. It is opposite the middle of, and a little internal to, Poupart's ligament. It may be displaced much internal to this situation, rarely it has been found in the pelvis; but if it is not in its usual position, it is most commonly to be found high up in the lumbar region just under the liver, having maintained the position normal to it during the third month of foetal life.
In the embryo the caecum and appendix develop originally as a simple diverticulum from the gut without any indication of separation between the two. Later on the terminal part of the tube ceases to develop and remains as the appendix, while the proximal portion continues to grow to form the caecum. Very rarely the foetal type of caecum and appendix has been noticed in adults; in such cases there is a large conical caecum and the appendix is a narrow continuation from the apex of the cone. There is an interesting specimen of this type in the Museum of the

Anatomical relations of the appendix

Variations in the position of the appendix.

Royal College of Surgeons. It was taken from the body of a man by Sir F. Treves. The caecum is over four inches in length, and is drawn out into a cone from the apex of which the appendix takes its origin. The appendix itself measured eight inches.

From the development of the appendix it would appear as if there were no longer any function for it to perform in the economy of nature, and it is therefore left in a rudimentary condition. In the normal condition it is attached to the posterior and internal margin of the caecum, usually about one inch below the ileo-caecal valve. Its length varies greatly - on the average it measures about 3½ inches; the writer has found one in post mortem examination that measured 5½ inches, and it has occasionally been found to measure eight inches. Its direction in more than half the cases is upwards and inwards; it may however be directed straight down into the iliac fossa, into the pelvis, upwards along the inner or the outer surfaces of the caecum and colon, or occasionally directly inwards. Frequently it is found coiled or twisted upon itself and lying just behind the caecum. In one post mortem

Case of Abnormality in position of the Appendix.

Structure of the Appendix.

Examination the writer found it pass down into the pelvis and firmly adherent to the anterior surface of the rectum an inch below the sigmoid flexure. With such a great possibility of variation in its position, it is easy to understand the difficulty sometimes experienced in finding it, and in locating pus or other effusion consequent upon its various pathological conditions.

The structure of the appendix is generally similar to that of the caecum & colon. Its mucous membrane is abundantly supplied with lymphoid tissue analogous to that found in the tonsils. This may be collected together into follicles or may be uniformly distributed in its whole extent. Underneath the mucous membrane, there is much fibrous and muscular tissue arranged in two layers, the internal circular, and the external longitudinal. This fibrous tissue is often much hypertrophied in inflammatory conditions, and may lead to the formation of strictures and cysts of the appendix, or sometimes to obliteration of the lumen of the organ. The lumen of normal appendices is usually found of such calibre as to admit a large quill, but may

Relations of the Peritoneum to the Caecum and Appendix.

Pathology of Appendicitis.

vary considerably.

The caecum is usually completely covered by peritoneum. Its anterior surface is always quite covered, but in some cases the posterior surface is left uncovered on account of the divergence of the layers of the proximal part of the mesoappendix. The appendix is as a rule entirely covered, and the two folds of its covering form the mesoappendix. When the organ however is in an abnormal position, as for example, when it lies behind or on the outer side of the caecum in the subperitoneal areolar tissue, it may be uncovered by peritoneum. The mesoappendix may extend to only one third or one half the length of the tube. It often is very short, and this feature may appear to be the cause of twisting or coiling of the appendix upon itself, and may thus lead to the formation of cysts by preventing passage of mucus into the caecum.

Pathology. There appears to be still much uncertainty among the chief writers on this subject as to whether the term Appendicitis is invariably the correct name for the disease which it denotes, — whether the symptoms manifested are not sometimes al-

References :-

(A.) Treves', "Perityphlitis," page 5.

least due to disease in the caecum and not in the appendix. Some writers therefore still maintain that Perityphlitis, as meaning literally "inflammation around the caecum" is a more correct name for the disease. This term has a wider application and can be used to include all cases of the disease in question whether they have their origin in abnormal conditions of the appendix or not — although it is now admitted that they nearly all have such origin. Sir F. Treves (A.) says that over ninety per cent of cases of inflammation in the right iliac region have their origin in the appendix. Still he maintains that it is quite possible to have all the symptoms of appendicitis caused by ulceration in the caecum, and the appendix in every way perfectly healthy. He gives details of several cases in which he has opened abscesses over the caecum, and has found ulcers in the wall of that portion of the bowel, and the appendix to all appearance perfectly normal. He admits however later on that in other cases of a similar kind where he has thought the appendix healthy, it has on microscopic examination been found to be

Case of Appendicitis of possibly Caecal origin.

Reference :-
Tubby, "Appendicitis", page 21.

seriously diseased. Nevertheless he firmly believes that stercoral ulcers frequently give origin to all the signs of appendicitis. Tubby (ed.) gives an account of a case in which he believed that changes in the caecum alone were the cause of the symptoms. A woman aged forty was admitted to Westminster Hospital suffering from pain in the right iliac region. There were localised swelling and tenderness, and other signs of Appendicitis. The temperature remained normal, and the pulse rate never went above eighty per minute. Dr Allchin and Mr Tubby both diagnosed perityphlitis caused by impacted faeces. With treatment by enemata the patient rapidly recovered. It would appear that when faeces have been long retained in the caecum and colon, they may give rise to inflammatory action in the wall of the bowel which may lessen the resistance of the wall to the bacillus coli and other bacteria among the faeces, and this may sometimes lead to many of the symptoms of appendicitis. The writer recently had a case which seems to confirm this view. On 17th July he was summoned to see a girl, E. C. aged nineteen, who was suffering severe pain in the abdomen, and had vomited all her food

during the day. On examination I found great tenderness over the right iliac region, and in that situation there was a distinct swelling made out. The pulse rate was ninety four and temperature 100·6. There was a long history of chronic constipation. I ordered complete rest in bed, liquid diet; and an enema of soap and water to be given at once, with hot fomentations over the abdomen. Next day the pain was still severe, & the swelling was if anything larger. It was said that the enema the previous night had been without result. I at once gave her an enema consisting of ℥ii of Castor oil, followed by a pint of soap and water. This soon caused a large motion, and next morning (19th) the pain was much relieved, and the swelling was smaller in size though still tender. Two days later the swelling was quite gone, and patient was practically well. This case was evidently one of severe constipation, but there must have been some septic absorption to cause the signs of appendicitis which were present. Of course in this case it is not possible to be certain that the appendix was not inflamed, although the fact that a good purging at once cured the patient seems to show

The Appendix in appendicitis.

Reference:- Deaver's, "Treatise on Appendicitis", page 176

that the caecum was at fault. On the other hand we have only to turn to some of the more recent American writers on this subject to find sufficiently dogmatic assertions that stercoral typhlitis does not occur. "The assertion that it does occur," says Deaver (4.), "is not based upon any sound evidence found at either operation or necropsy. By some a series of cases presenting pain, tenderness, and a more or less soft tumour in the right iliac fossa, constipation, slight fever, &c have been recognized as stercoral typhlitis — not that any one has ever described the anatomic lesions of stercoral typhlitis, but solely on clinical assumption." He goes on to say that early operation in such cases always shows the existence of catarrhal appendicitis with serous or fibrinous peritonitis. There is evidently room for much more evidence on this question. All writers are now agreed that inflammatory symptoms in the right iliac region are due much more frequently to changes in the appendix than in the caecum, and the most recent view is that the percentage of cases due to changes in the caecum – if any such occur – is so small that for all practical purposes it may be said to be nil. The <u>pathological conditions of the appendix</u> are very various. They are more to be regarded as stages in

Catarrh of the appendix

Causation of Catarrh of the appendix.

The morbid changes.

one pathological process than as conditions precisely distinct. It is not always possible to say — indeed it is sometimes little more than a matter of speculation when one is treating a case before operative proceedings have been resorted to — to what extent the disease in the organ has proceeded. One stage may pass very gradually into the other, and the process may have reached almost any degree before the patient comes under observation. The slightest form of pathological change met with is <u>Catarrh of the appendix</u>. This has frequently been found post mortem in the appendices of persons who have never suffered from appendicitis. It may therefore remain for a long time latent. On the other hand it may go on to cause further more severe changes in the appendix, or lead to severe peritonitis. As to causation, it seems probable that a small piece of faeces may pass into the appendix, and remaining there for some time may irritate the mucous membrane to a catarrhal condition, just in the same way as constipation may give rise to catarrh in the large intestine. During the catarrh the morbid changes consist of shedding of the epithelium, and infiltration of the submucous

Changes in the lumen of the appendix.

Formation of Cysts

Reference:- Coats, "Manual of Pathology", page 753.

and muscular layers with leucocytes. There may be much hypertrophy of the fibrous and muscular layers. If this process is continued for long, we may have as a result thickening of the walls of the organ resulting in narrowing or obliteration of the lumen of the appendix. This may be either partial or complete. If partial, the lumen is blocked by a band of the fibrous tissue at one or more points in its length. Between these points of constriction the mucus which continues to be secreted collects, and not finding exit gradually causes dilatation into one or more Cysts. These cysts may be of very considerable size; Sir S. Wilks has recorded one from which escaped four ounces of odourless mucus, and there is a good illustration of a cyst in Coats' (4th ed.) Pathology. They are usually found to contain bad-smelling fluid in which septic changes have occurred, so that when the walls of the cysts become degenerated, we may have rupture or perforation of the appendix leading to some of the severest forms of appendicitis. Where we have complete obliteration of the tube, it is converted into a simple fibrous cord. It is then free from danger so far as causing appendicitis is concerned. This formation of a fibrous cord is

Case of almost complete obliteration of the lumen.

Ulceration of the appendix.

Causation

unfortunately very uncommon, and when it is found, it has been preceded usually by a considerable number of more or less severe attacks of appendicitis. The writer made a postmortem examination on 12th July last on the body of a patient who had died from pelvic cellulitis and oophoritis following the third attack of inflammation of the appendix. The lumen of the tube was in almost its whole length obliterated, its walls were thick and hard, but at its extremity it was dilated to the size of a small marble, the cyst being filled with thick muco-purulent matter.

The next step in the process is <u>Ulceration of the appendix</u>, and this is perhaps the commonest condition in appendicitis. In most cases it appears to be connected with the presence of a faecal concretion, and sometimes of a foreign body. The concretions are formed in the appendix by the gradual deposition of salts from the mucous secretion around a core of faecal matter. They lead to inflammation in the wall around them, followed by ulceration. This opens the way for the entrance of the bacillus coli, and other microorganisms and their products. The ulcer may rupture into the peritoneum, allowing septic matter to enter that cavity, and appendicitis results with localised

Case of faecal concretion causing ulceration and rupture.

Gangrene of the Appendix.

abscess or general peritonitis. It does not however require that perforation should have occurred before appendicitis manifests itself. The vermiform process has often been removed from abscesses, and shown no sign of being perforated. After opening the abscess, it is not uncommon for the surgeon to find at the bottom of the cavity a faecal concretion which has been extruded through the perforation in the appendix. In the Museum of the Royal College of Surgeons there are some interesting specimens of these concretions and the appendices from which they were taken. There is an appendix removed by Mr Eve from the abdomen of a girl of nineteen who had symptoms of peritonitis following, as was said, a kick on the stomach. The end of the tube is occupied by a concretion an inch long. Its extremity had given way, and the concretion projected into the peritoneal cavity; another perforation can be seen at the proximal end of the occluded portion of the canal.

The final stage of disease of the appendix which is found is gangrene, and this may be total or partial. It is a curious fact that this is sometimes very difficult to discover in the examination of the organ

The Peritoneum in Appendicitis:—

A. Localised Adhesive Peritonitis.

just after operation. The writer has been told by a surgeon of large experience that in operations, where there was either a localised abscess or even general peritonitis, he has more than once been unable to find anything wrong in the appendix, and yet on microscopic examination it has been found to have a patch of commencing gangrene. It would appear that when the epithelium at any spot has been shed, either owing to irritation of faecal concretions or of foreign bodies, the bacillus coli may invade the deeper portion of the walls in a most virulent form and rapidly cause the death of the tissues. The gangrene may be a local patch in the tip or other part of the appendix, and may or may not lead to perforation; or the whole organ may be completely dead and detached from the caecum, leading to faecal discharge into the peritoneum.

The Peritoneum in cases of appendicitis is affected in three different ways according to the type the disease takes. In the large majority of cases which come under treatment of the general practitioner there is a localised peritonitis which may be very acute, but which does not pass on to suppuration. There may be much effusion of lymph,

B. Localised Suppurative Peritonitis.

The Situation of the Abscess.

and oedema of the parts giving rise to great swelling, but it sooner or later clears up. It may however leave in its train adhesions formed by organisation of the effused lymph — these may cause obstruction of the bowels by contracting and dragging upon parts of the ileum to form strictures or twists of its lumen. This form of peritonitis is usually present when the appendix is in a condition of catarrh of some standing, or is the seat of cystic formations due to strictures in the lumen or twists upon itself.

In the second class of cases the peritonitis is characterised by the formation of a localised abscess. As a rule in such cases the appendix has undergone a more advanced degenerative change than in the former class. The appendix may however be merely in a state of catarrh as before, but it is generally found to be ulcerated at some part, and frequently a faecal concretion is to be found in contact with the ulcer and probably causing it. Or the appendix may be gangrenous in whole or part as before mentioned. The abscess is found in various situations according to the position relative to it of the caecum. Thus it may be placed with the caecum forming its posterior wall, the coils of adherent small intestine

Character of the pus.

Reference:- Coats', "Manual of Pathology", page 741.

closing it internally, and the parietal peritoneum limiting it on its anterior surface. In this situation it is easily reached by the surgeon's knife. Again the abscess may form downwards towards the pelvis with the adherent coils of intestine and omentum bounding it above, and shutting it off from the general peritoneal cavity. Thirdly the pus may be found behind the caecum retained in that position between internal and external walls of peritoneum. When in this situation it occasionally finds its way, if not liberated at an early stage of the disease, upwards to the neighbourhood of the right Kidney or even to the under surface of the liver. Cases have been reported where the pus penetrated the diaphragm and discharged into the pleura, and finally got out through the intercostal spaces. In Coats' Pathology (4) a case is narrated in which the pus crossed over above the promontory of the Sacrum to the left side, then tracked up the side of the spine, pierced the diaphragm, and discharged into the pleura.

The pus found in appendical abscesses is usually dirty green in colour and of a foul odour. In all cases seen by the writer the odour has been

Results of abscesses in neglected cases.

Case of pointing of an abscess near the umbilicus.

most pronounced. In one case it was distinctly faecal, although no trace of actual faeces could be found in the depth of the abscess.

As regards the result in cases left to themselves, the abscess usually points at some spot over the right iliac region, although it may show itself first in the thigh, the loin, the pelvis, the lung, or at various other points. She writer has notes of a case of a child aged two years in which an appendical abscess suddenly burst at a point within an inch of the umbilicus. He was summoned early one morning, and found the child in its bed surrounded by pus. On the previous evening, when he first saw the patient, the tissues over the right lower part of the abdominal surface were swollen and somewhat oedematous, but the sudden escape of pus where it appeared next morning was quite unexpected.

If the pus enters the sheath of the psoas muscle it may pass down into the thigh and closely simulate psoas abscess. It may also pass in front of the hip joint and be mistaken for morbus coxae. Again it may proceed towards the pelvis, and give rise to suspicions of disease in the pelvic cellular tissue which has

C. General Peritonitis.

its usual origin in connection with the uterus or ovaries, or it may discharge into the rectum or bladder. The most dangerous result that can happen is that it may burst into the general peritoneal cavity. As a consequence of this, general peritonitis results, and if operation is not done within a very short time death is certain to follow. The third variety of affection of the peritoneum that may occur in appendicitis is General Peritonitis. In this form the appendix is usually in a state of very advanced disease – probably perforated or gangrenous. In the presence of such lesions a severe diffuse inflammation of the serous membrane results, the degree of severity depending no doubt on the amount of the bacilli and their products that have found their way through the wall of the appendix. There follows effusion into the peritoneal cavity of serous, seropurulent, or wholly purulent fluid. This varies in amount, sometimes being very copious, but in the most rapidly fatal cases scanty. It has usually an offensive odour. If this form of peritonitis is not immediately fatal, the intestines may be found matted together, and there may be minute abscesses in the adhesions binding the coils together.

Bacteriology of appendicitis.

Etiology of Appendicitis

Reference :- Hawkins, "Diseases of the Vermiform Appendix," page 71.

The Microorganism that appears to be in nearly all cases the cause of appendicitis is the bacillus coli communis. Hawkins (A.) found this bacillus in the exudation of 57 out of 61 cases of general peritonitis or localised appendical abscess examined. Occasionally other organisms are found — chiefly the streptococcus pyogenes and the pneumococcus. Like other bacilli, the bacillus coli is frequently found in the caecum and appendix as well as other parts of the intestinal canal during health, and is then nonvirulent, but when the appendix is attacked by catarrh or other pathological process that lessens its resistance, the bacilli become virulent and have a rapidly destructive influence upon the tissues.

The Etiology of Appendicitis.

Heredity does not appear to have much influence in causing appendicitis, although one occasionally finds that members of the same family are subject to the disease. The writer is medical attendant to a family in which the two eldest daughters have had several attacks of appendical trouble, and the third one is just recovering from her first attack.

Age has much to do with the causation of appendicitis.

The disease is one chiefly of the first quarter of life, though it may occur at any age. The writer's casebook contains notes of cases at two years, four years, and sixty two years respectively. According to Hawkins forty per cent of the cases occur between the ages of ten and twenty years.

Sex. Appendicitis is much more common in males than in females. The proportion is usually given as four to one, although in the writers limited experience it is nearer that of five to two.

Season. The majority of the writer's cases have occurred in Summer and autumn. This is the usual experience and it has probably to do with the fact that it includes the fruit season, when irregularities in the intestinal functions are most prevalent.

Injury is said by most authorities to be the cause of many cases. The writer has occasionally been told by patients that their illness began with some sudden strain, but in his experience the question of a blow on the abdomen as the cause has not required discussion.

Irregularities in Diet have been in the writer's cases by far the most common probable cause of appendicitis.

Reference :- (A.) Treves' "Perityphlitis", page 21.

There has usually been a story of a meal of some heavy and indigestible food having been taken, or of a meal having been taken in great haste so that the food was bolted. The insufficient mastication of the food caused by bad teeth has no doubt frequently had to answer for an attack of appendicitis. The writer has known a severe attack follow the eating of three or four barely ripe apples. It is interesting that (4.) French fruids that commercial travellers are liable to this disease more than men in other occupations — no doubt because they have so often to push through their meals and catch trains. The persistance of constipation for long periods seems to favour the occurrence of appendicitis, and all varieties of dyspepsia are frequent in those liable to this complaint. Indeed those who suffer most are as a rule confirmed dyspeptics, who know they must be very careful about their food and the regulation of the bowels.

Foreign Bodies are occasionally the cause of appendicitis, such as pins, small shot, hairs, pieces of wood, or other indigestible matter. The presence of fruit stones, such as stones of cherries, grapes, or dates in the appendix is now discredited as being a common cause of the disease

Classification of cases

Reference :- (A.) Treves, Op. cit. page 23.

although no doubt it is so occasionally, the bodies formerly thought to be such being now proved to be concretions formed in the appendix itself by chronic catarrh or from small faecal masses coated with salts. The writer has seen an appendix which was removed from the abdomen of a young man who suffered from localized abscess. A seed had lodged in it, and had caused ulceration leading to abscess around the caecum. In the College of Surgeons Museum there is a specimen of an appendix in which a pin, 1¼ inch in length is lodged. It is situated with its head against the distal end of the appendix and the point turned towards the caecum. The wall surrounding it was much thickened, but ulceration had not begun and throughout life it had caused no symptoms.

The Clinical Features of Appendicitis. It is not possible to make an exact clinical division of cases of appendicitis. The symptoms are usually so uncertain and the course so unforeseen that attempts to do so fail. Recent authorities therefore consider the subject in divisions suggested by various considerations. Thus Treves groups the cases into groups according to the severity of the symptoms viz – 1. An ordinary attack, the case ending in resolution 2. An attack ending in suppuration 3. An attack of the mildest type 4. A most intense and acute attack; and

5. Certain peculiar forms of appendicitis. This method of grouping is useful for describing the clinical varieties met with, although the divisions are rather indefinite and perhaps not all mutually exclusive. It has no pathological basis. In putting together the notes of some of his cases the writer proposes to arrange them in three groups corresponding to the forms of affection of the peritoneum present in each. It has been pointed out in speaking of the pathology of appendicitis that we may have one of three forms of peritonitis in this disease – the first being localised and ending in resolution without suppuration, the second characterised by the formation of localised abscess, and the third being general or diffuse peritonitis. This pathological grouping will serve as the basis for the clinical description following. In adopting this method of classification it is of course to be understood that it is not of much service at the beginning of a case, as one cannot with any certainty place it in any of the divisions until the attack is over.

The three divisions under which we propose to group the cases and consider them clinically are as follows:—

1. Cases characterised by localised peritonitis which ends in resolution without suppuration. This

Hawkins' Analysis of Cases at St Thomas's Hospital.

Analysis of Writer's thirty Six Cases.

Reference:- (A.) Hawkins. Op. Cit. page 124

division includes a great majority of the cases; in it are the great numbers of mild attacks which are seldom seen in hospitals.

2. Cases in which there is localised peritonitis resulting in the formation of an abscess.

3. Cases in which general peritonitis is found.

As to the relative frequency of these three divisions of cases, the following table is taken from Hawkins' (4.) book showing the cases at St Thomas's Hospitals and their results—

	Number	Deaths	Mortality per cent
Div. I	190	—	—
Div. II	38	10	26·3
Div. III	36	24	75·0
	264	34	14·0

This appears to be about the average mortality in severe attacks. In the writer's limited experience the corresponding figures are as follows: —

	Number	Deaths	Mortality
Div. I	over 25	—	—
Div. II	9	2	22·2
Div. III	2	2	100
	36	4	11·1

It will be convenient to describe cases that have

DISEASE

Appendicitis

Ending in resolution

NOTES OF CASE

NAME { E.P.

AGE 20

DIET

CASE BOOK No.

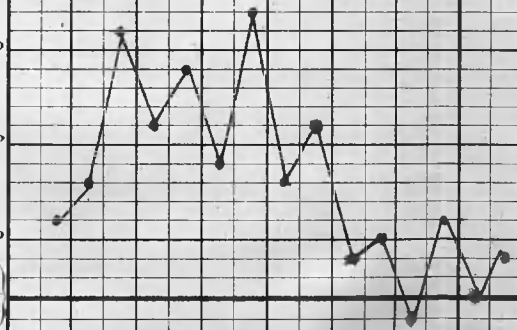
DATE OF ADMISSION

RESULT

DATE	13 June	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th
DAY OF DISEASE	1	2	3	4	5	6	7	8	9	10	11	12
TIME	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E

R	P	T
42	155	107°
39	145	106°
36	135	105°
33	125	104°
30	115	103°
27	105	102°
24	95	101°
21	85	100°
18	75	99°
		Normal Temperat of body
15	65	98°
12	55	97°

PULSE.	88	86	108	96	84	100	112	94	98	88	88	78	88	74
RESP.														
BOWELS.														
URINE.														



42° 41° 40° 39° 38° 37° 36° 35°

Temperature Centigrade

Down Bros' Hospital Temperature Chart. Entered at Stationers' Hall. 21, St Thomas's Street, London, S.E.

occurred in the writer's practice which illustrate these divisions most typically, then to bring forward examples of cases that have exhibited unusual features, and later to make general remarks on the symptoms in detail as summed up from the cases.

1. Cases characterised by local peritonitis and ending in resolution without suppuration. The writer was summoned on 13th June 1900 to see a youth of twenty - E. P. - who complained of severe cramplike pain in the abdomen, and had vomited all his food that day. On examination it was found that the pain was most severe just around the umbilicus, and from there it extended in rather less degree towards the right iliac region. There appeared to be slight distension of the lower part of the abdomen, and respiratory movement was somewhat restricted. On palpation the whole right abdominal surface was very tender, and complete examination could not be allowed. There was some increased resistance over the right iliac region, but no tumour could be made out. Temp. was 99·2 (see chart) and pulse 88. Vomiting had occurred three times. The bowels had been constipated for some weeks and the last motion had occurred two days previously. The face

Case taken as type of first division of cases.

had an anxious expression. Patient lay on his back with his legs drawn up, and on the right limb being forced downwards, he cried out with pain.

Complete rest in bed was ordered and the patient warned to move as little as possible. Nothing was given in the way of food that night, a little potash water was allowed now and again to quench thirst. Morph. Hydrochlor. ½ was injected hypodermically. Linseed meal poultices were ordered for the painful area on the abdomen. The notes continue as follows – 16th June. Patient slept only two or three hours in the night. The pain is now localised in the right iliac region and still severe. The poultices give considerable relief – but only for a short time. Vomiting has not occurred again. The tongue is dry & slightly furred. On examining the abdomen there was found a good deal of tympanites, and the movements in respiration were still limited. No swelling could be seen in the right ilium, but on palpation there was great tenderness and increase of resistance. The skin at some spots was exquisitely tender; when the finger was pressed on 'McBurney's point' the patient cried out with pain. The bowels have not yet been relieved. The temperature has risen today to 101·2, but the pulse is full strong and regular, though it ran to 108 in the evening.

The poultices were ordered to be continued. The diet consisted of meat extracts — beefsea and bovril. An enema of turpentine in yolk of egg and water was given — no motion resulted although much flatulence passed. No opium was given, but a mixture containing Bismuth Carb. gr 5, was ordered every four hours

15th June — Patient slept four hours in the night & feels a little more comfortable. Face not so distressed. Tongue very dry. Great thirst complained of. On examination the abdomen was found to be not so much distended. On palpation a distinct swelling was felt in the right iliac region; it was about three inches long and two inches broad and felt not unlike a sausage; it lay parallel to Poupart's ligament extending upwards and outwards from a point corresponding to the middle of that structure. It is painful on pressure, but patient can allow much more handling than yesterday. On percussion the swelling is quite dull. No fluctuation can be made out.

Poultices discontinued. Pain is not now so great as to require them, and it may be well not to soften the skin any more than necessary in view of the possibility of operative procedures being required later on. Diet as before with addition of some chicken broth.

16th June — Had restless night, feels hot & thirsty. The

The face looks again rather drawn & haggard. The general condition is not much changed since yesterday. The temperature reached 101·4° in the evening and the pulse was 112, but full, strong, & regular. Bowels have not yet acted. The swelling is more prominent today, and feels firmer, but the tenderness is not so marked. There is no fluctuation, and the percussion note continues dull.

Patient was ordered an enema of an ounce of castor oil followed by 1½ pint of soap and water. Diet unchanged.

17th June. Patient feels much better. The enema brought much faecal matter away, with some hard lumps like marbles covered with thick greenish mucus. Slept for five or six hours. Pulse & temperature both better today. The swelling is not perceptibly changed since yesterday, but the tenderness is decreasing.

18th June — Improving. Slept six hours in the night. The swelling is decidedly smaller in size. There is no fluctuation. Patient can now stretch out both legs without pain.

19th June - Much better. Complains of hunger. The tongue is cleaning & moister. Bowels acted naturally last night, and abundant mucus was seen in the motion.

Symptoms of this class of cases.

20th June. Temperature practically normal today. The swelling is about half its original size, and softer, but without any fluctuation

From this date patient made a very good recovery; the swelling was gone by the 24th although for some time afterwards there was tenderness on deep pressure at McBurney's point. Patient was kept in bed for a fortnight after the temperature had reached the normal, in order to give time for the complete absorption of the effused products forming the swelling. Solid food - dry toast - was first allowed on 23rd, and two days later fish was added to the dietary. He rapidly regained strength. He was advised to avoid all strenuous work or exercise for a few months, and general advice in regard to taking plenty of time over meals, and doing all he could to avoid dyspepsia and constipation was also given him. Since this illness patient has enjoyed good health up to the present.

The foregoing notes afford an example of a fairly characteristic case of our first class. The onset is usually abrupt, it may occur without the slightest warning On the other hand patients usually say they have had much trouble lately with their bowels, or have had troublesome indigestion with perhaps occasionally

some twinges of colicy pain in the right side. Severe pain and vomiting are usually the first symptoms; the pain as in our case, is felt first as a rule about the umbilicus, and becomes located in the right iliac region after twelve hours or thereby. In second and later attacks however the pain comes to be felt in the right groin from the commencement. It is at first described as of a tearing or bursting character, with paroxysms of increased severity. Later on it becomes a dull aching. It may be sufficiently severe to cause marked collapse.

The Vomiting is sometimes severe, but is usually confined to the beginning of the illness, as in the case of S.P. It is not so constant a symptom as in our second group of cases, where suppuration is present.

Constipation is usually present; the bowels may not have moved for some days before the onset, as in S.P.

Diarrhoea has never been found by the writer in these cases but it is sometimes a feature, and may persist throughout the attack. The position adopted is nearly always on the back with the legs drawn up. This relaxes the abdominal wall and relieves the tension over the seat of the disease.

The Temperature varies much in different cases, but on

looking at the charts of various cases there are points of similarity that strike one. At the very commencement the writer has in several cases found the temperature subnormal when the patient has been much collapsed, but it runs up within a few hours thereafter sometimes to a high degree. In the case above adduced it reached only 101·2° on the second day, but occasionally when the case promises to be a severe one it goes to 103° or 104° within twenty four hours. In writer's experience the temperature as a rule begins gradually to decline after the sudden rise of the first day, but sometimes, as in E. P.'s case, it may subside to some extent for a day or two days, and then rise slightly again preparatory to falling definitely and continuously as the disease declines. In most attacks, writer has found the temperature reach the normal point from the seventh to the tenth day, though he has found it sometimes rise a degree or so in the evenings for a few days afterwards. The time at which the temperature falls is an important matter; it is sometimes useful in helping us to form an opinion as to whether we may have suppuration around the appendix or not. It is usually held that if the temperature falls to nearly normal about the fifth to the

Seventh day, then again rises, and reaches nearly its former high level, the presumption is a strong one that suppuration has occurred. This rule however is by no means infallible as the writer has had several cases to prove. These will be adduced later on.
As above stated the temperature usually falls gradually to the normal level. It may however occasionally come down with a crisis, as occurred in one interesting case of the writer's.
The pulse is the general febrile pulse. It seldom runs to more than 110 or 116 per minute. The pulse rate is one of the most reliable indications of the progress of the disease in appendicitis.
Examination of the Abdomen. As in the case adduced, there is nearly always much tenderness over the abdomen. It may at first be all over the abdominal surface, but within twenty four to thirty six hours it becomes gradually more limited in area, and remains localised in the right ilium until the case is over. The skin over this region is extremely sensitive, and the slightest touch with the finger may give the patient great pain. Tenderness on deeper pressure may last for weeks or even months after the acute symptoms have disappeared.

Rigidity is usually well marked over the tender area. The muscles of the abdominal wall are rigidly contracted, and the ordinary movement of the surface during respiration is therefore absent.

Distension of the Abdomen is in varying degrees an almost constant feature of appendicitis. It becomes evident usually about the second day of illness, and is more marked over the seat of the disease. In mild cases it soon subsides and it is often readily relieved as in the case above, by a turpentine enema.

Dulness to percussion in the right iliac region is found on the second day, or as soon as a satisfactory examination is allowed. It extends from Poupart's ligament inwards for two or three inches, and may reach for some distance upward over the ascending colon.

A swelling is usually felt from the second day onward. To the palpating hand it may feel like a sausage in form and consistence, or it may be very irregular in outline. It becomes more prominent as the case progresses, and is most marked about the third or fourth day in average cases. It is usually situated parallel to the outer half of Poupart's ligament, about an inch internal to that structure as in the case above described. It

may begin to subside as the temperature falls, but on the other hand it may remain without much diminution in size for five or six days, or even more, after the symptoms have disappeared. Usually however it subsides rapidly after the fifth or sixth day. It is as a rule dull to percussion all over its surface, but sometimes parts of it may be tympanitic. The pathological explanation of this fact is that the swelling is composed of coils of intestine together with the caecum, with their walls thickened and oedematous, and matted together with omentum and more or less effused lymph, and these coils are often distended with gas.

While the case above described illustrates fairly well the usual course of an attack of appendicitis which ends favourably in resolution, it must be remarked that the variations from this type are numerous. There are cases which run a much shorter course; they may be marked by fever of only one, two, or three days' duration, and the writer has met with many in which the temperature has been normal by the third day. First attacks are generally of at least average severity, but in patients who suffer from relapsing appendicitis the mild character of some

Very mild cases.

Case of mild frequently recurring appendicitis.

of the attacks is remarkable. In such cases the patient may have some indication beforehand - such as obstinate constipation, recurring colicy pains, or dyspepsia — of the imminence of an attack, he may go to bed at once, abstain from food, take a brisk purgative, and in this way if he does not ward off the attack altogether, he probably greatly reduces its severity. The writer knows a gentleman holding an important position who has on the average four attacks of this kind every year. When he has any reason to believe that an attack is coming on, he lies up at once and keeps his bed for three or four days, and by the end of that time he feels all right again. His temperature seldom goes above 100°, and it is generally normal again in less than forty eight hours. Being now sixty years of age and the attacks being so slight, he does not care to take the advice of his medical friends and have the appendix removed. The writer has now ceased to support this advice, on the ground, that as he has come through such numerous attacks in the course of nearly twenty years, the appendix has doubtless formed most dense and close adhesions, so that the risk of removing it might be considerable.

Prolonged cases.

Case marked by unusually prolonged fever, and Crisis on the seventeenth day.

On the other hand the course of the disease may be much more prolonged than in the case adduced. The temperature may remain high for ten, fifteen, or even twenty five days, and then begin to come down, or come down suddenly with a crisis. When the case hangs on like this it is a most difficult matter to decide whether it is to end in resolution at all, or whether suppuration will ensue. Every day the patient appears to get weaker and more exhausted, he loses flesh rapidly, his tongue gets very dry and furred, and with his friends continually asking why no signs of improvement are to be seen, the medical attendant is forced to consider whether operation should not be undertaken immediately without waiting for definite evidence of suppuration. The treatment of such cases will be discussed later on, suffice it here to say that under such circumstances the writer would certainly advise early operation, more especially if it was a first attack. But the following cases are here brought forward to show how sometimes the symptoms may last fourteen or twenty one days and show no sign of abating, - and the medical attendant feel confident that he will have to deal with a localised abscess, - and then most unexpectedly subside:-

P. B., aged 16, was taken ill with sickness & diarrhoea

DISEASE

Appendicitis

Ending in resolution

NOTES OF CASE

NAME P. B.

AGE 16

DIET

CASE BOOK Nº

DATE OF ADMISSION

RESULT

DATE	15 Oct.	16th	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th	31st	1st	2nd	3rd	4th
DAY OF DISEASE	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
TIME	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E

R	P	T
42	155	107°
39	145	106°
36	135	105°
33	125	104°
30	115	103°
27	105	102°
24	95	101°
21	85	100°
18	75	99°
		Normal Temperat of body
15	65	98°
12	55	97°

PULSE.	80	92	96	92	108	108	112	84	80	80	80	72	80	108	108	108	116	106	112	80	100	88	72	92	76	84	104	106	112	84	96	84	90	76	88
RESP.																																			
BOWELS.																																			
URINE.																																			

42° 41° 40° 39° 38° 37° 36° 35°

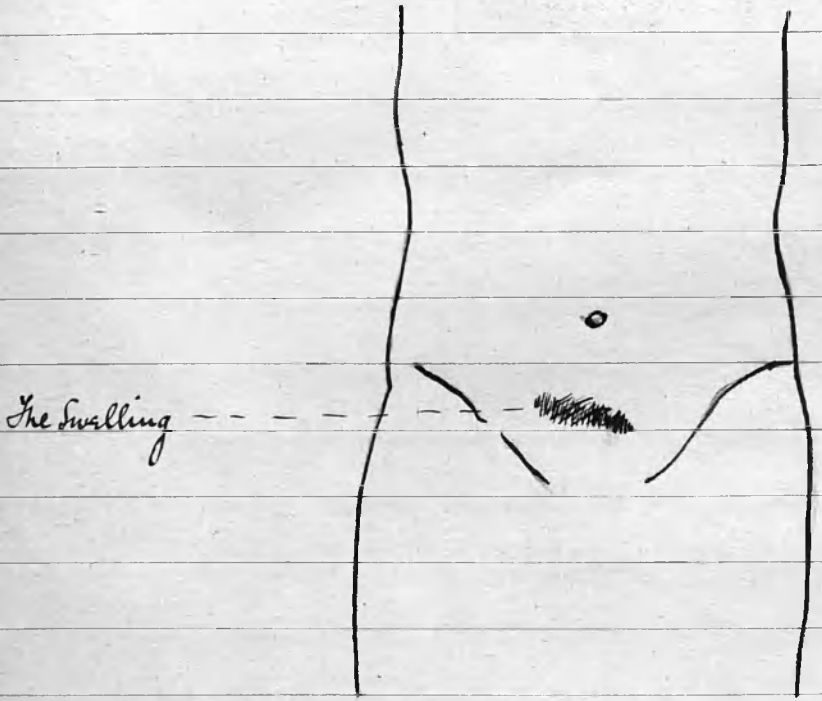
Temperature Centigrade

Down Bros' Hospital Temperature Chart. Entered at Stationers' Hall. 21, St Thomas's Street, London, S.E.

after eating a number of barely ripe apples on the evening of 14th Oct. 1900. These symptoms continued until the next night, when the writer was sent for. When patient was first seen there were the symptoms of commencing appendicitis as above described, viz. the following:- Severe pain was complained of in the right iliac region, and from there upwards towards the umbilicus; the abdomen was slightly distended, and its right lower quadrant was rigid and extremely tender to the touch; there was no swelling to be made out; the patient was in bed lying on his back with his knees drawn up. The temperature was subnormal, viz. 98°, and the pulse was 80 per minute, full, and fairly strong. Vomiting had occurred twice.

Perfect rest in bed was ordered, and abstinence from all food. A little potash water was allowed occasionally to relieve thirst. Hot fomentations were applied over the site of the appendix, and as the pain was extreme a hypodermic injection of morph. Hydrochlor. gr 1/4 was given. The notes proceed as follows —

16th Oct. Patient had a restless night, and got no sleep. The pain is still extreme. Distension is greater than last night. Tenderness marked over the region of the appendix. A large area is dull to percussion, and a swelling


The Swelling

can be made out on palpation; it has a soft doughy feel, and it appears to be about the size of a small egg. The greater part of it is to the left of the middle line about midway between the umbilicus and pubes, but it extends an inch or so into the right iliac region where its margin is rather indefinite.

The fomentations were continued; liquid diet consisting of small quantities of beef tea and meat juice was given, and an enema of turpentine followed by soap and water was ordered. At bedtime an injection of Morph. Hydrochlor. gr. ¼ was given as on the previous evening.

During the next few days the writer saw the patient every six hours or thereby as the pulse rate was beginning to run high — 108 to 112 on the fifth day — and he was on the watch for signs of general peritonitis, or of localised formation of pus. This patient had had at least two previous attacks of appendicitis, of which the former had been a very severe one and had occurred two years previously in Nottingham. At that time an abscess formed and was opened by Mr Anderson, but the appendix was not found at the operation. The second attack was in August 1900, that is to say, two months

before the illness now being described. He had enjoyed good health during the six weeks intervening between the second and third attacks.

19th Oct. Patient appears to be improving. The temperature has never gone above 100°, although the pulse was rapid for one day. Tenderness is still great, and the swelling above described is now the size of a fairly large egg. It is still mostly on the left of the middle line.

21st Oct: Doing well. Allowed weak tea with an egg flip. An enema has been given each alternate day since the onset, each time with success. The distension is almost gone.

22nd Oct. Patient has had a restless night, and is hot and thirsty. The temperature has again gone up — 100·6° morning and 100·8° at night. The pulse also is rapid, but full and strong — the pulse of fever. The tongue is dry and covered with yellowish fur. The breath is very foul. Vomiting has not returned since the onset. The swelling is still large; it feels fairly near the surface, is harder, and is dull on percussion. It is the position of the greatest tenderness. There is increased resistance from this swelling to the neighbourhood of Poupart's ligament. Some hard faecal masses like hazel-

motions were passed today, and each one was covered with thick flakes of mucus like the skins of grapes. An enema of castor oil was given with satisfactory results.
23rd Oct. Pain extremely severe today. There is much distension of the abdomen and flatulence. Temperature rose to 102·2° in the evening. The pulse ran up to 116 at night, but it remained of fairly good strength and not at all 'thready'. The swelling is about the same in size today, and the dulness extends over a large area—from Poupart's ligament to the middle line and beyond it over the swelling described above. The swelling is perhaps a little harder today, and it gives a peculiar half crepitant sensation on pressure. There is no sign of fluctuation. Patient was seen every six hours with a view to discovering the first sign of pus or of general implication of the peritoneum.
24th Oct. Since last note patient has been to all appearance slightly better. The temperature has been coming down a point each day with remarkable regularity as shown in the chart. It has again however gone up today to 101·6° while the pulse rate was 112 per minute. The patient is getting very thin and wasted, his face is drawn and haggard looking, and his eyes rather sunken. Has been kept on

liquid diet consisting of beef tea and meat juices and peptonised milk given in small doses at frequent intervals. The bowels have been kept open by an enema on each alternate day. The swelling is much the same as described in last note; it is now most prominent over the part beyond the middle line to the left, and halfway between the umbilicus and pubis. Its borders are more definite than hitherto; it is still fairly hard, and there is no indication of fluctuation. Examination by the rectum failed to elicit any new fact regarding the disease. This being the sixteenth day of illness, and the temperature showing no sign of a definite fall, but rather rising again as high as before, everything appeared to lead one to suspect that there was some small amount of pus in the neighbourhood of the appendix. It was therefore decided that operation should no longer be delayed, and arrangements were made to have it performed on the following day. In fact had this not been the second attack of this indefinite and prolonged kind in the same patient, an operation would probably have been recommended some days previously; - most likely on the 23rd Oct.

Occurrence of a Crisis; possible explanation.

Reference :- Treves, Op. cit. page 26.

when the temperature and pulse were both so high. This would have been the tenth day of illness, and at that date if the disease does not show signs of abating, one is usually fairly safe in expecting to find pus.

30th Oct. Patient had a restless night, sleeping not more than one hour. He was sick once in the night. However on taking his temperature the writer was surprised to find it subnormal, 97°, while the pulse rate was 84, weaker certainly than on the previous day but still of fair strength. A crisis had evidently come in the early morning. Later on in the day patient passed a large motion which contained much thick greenish mucus like grape skins as before. The evacuations were most carefully examined, but no trace of pus could be found in them.

In cases ending like the present in a critical fall, Treves (Op.) suggests that there may be a small abscess of perhaps only a few drops of pus between the coils of intestine, or omentum and intestine, which discharges through the wall of the bowel and causes the crisis. The writer had this idea in mind when he examined the stools so carefully. It would appear that Treves has no confirmation of this

The Question of Operation in this Case.

suggestion, but merely throws it out as a possible explanation.

1st Nov. For these past two days, patient has continued to improve. The temperature readings have been much better and are now practically normal. The tongue is beginning to clean. The abdomen is almost free from distension. The swelling remains distinct beyond the left of the middle line, but is certainly smaller. From this point patient made an uninterrupted recovery. The swelling in the abdomen could be palpated for ten days after the temperature had reached the normal point. Patient was kept in bed for a fortnight after all fever had gone. On getting about again he was recommended to wear an abdominal belt and to be very careful about his diet, and more especially to avoid uncooked fruits for some months.

This case well illustrates the difficulty experienced in deciding whether operative procedures are required or not. Many symptoms here appeared to indicate the presence of pus — the apparent progress during the first week giving place to recrudescence of fever and increased severity of symptoms, the rapid pulse, the large amount of dulness and the persistently increasing

Case in which operation for localised abscess was performed, but no pus found.

swelling, together with the general condition. Yet on the morning of the seventeenth day a crisis occurred, and from that point resolution quickly followed.

But an attack which this same patient had 2½ months previous to this shows perhaps even better than this one the difficulty there is in deciding whether pus is present or not. In this case suppuration was suspected, and an operation performed on the twelfth day, but no pus was found. The symptoms continued practically unabated, and did not finally subside until after the twenty first day, when resolution gradually occurred.

P. B.–aged sixteen – was seen first by the writer at midnight on 21st July 1900. He complained of severe pain in the right iliac region, chiefly about the scar of a former operation for appendical abscess two years previously; and shooting from there upwards and inwards to the umbilicus. The pain was not constant, but recurred frequently in severe paroxysms, and it was described as of a tearing or bursting character. He had been constipated for two or three weeks before, and the last motion had been three days before the writer saw him. He had vomited several times and there was constant retching while he was being examined.

DISEASE

Appendicitis

Ending in resolution.

NOTES OF CASE

NAME { P. B.

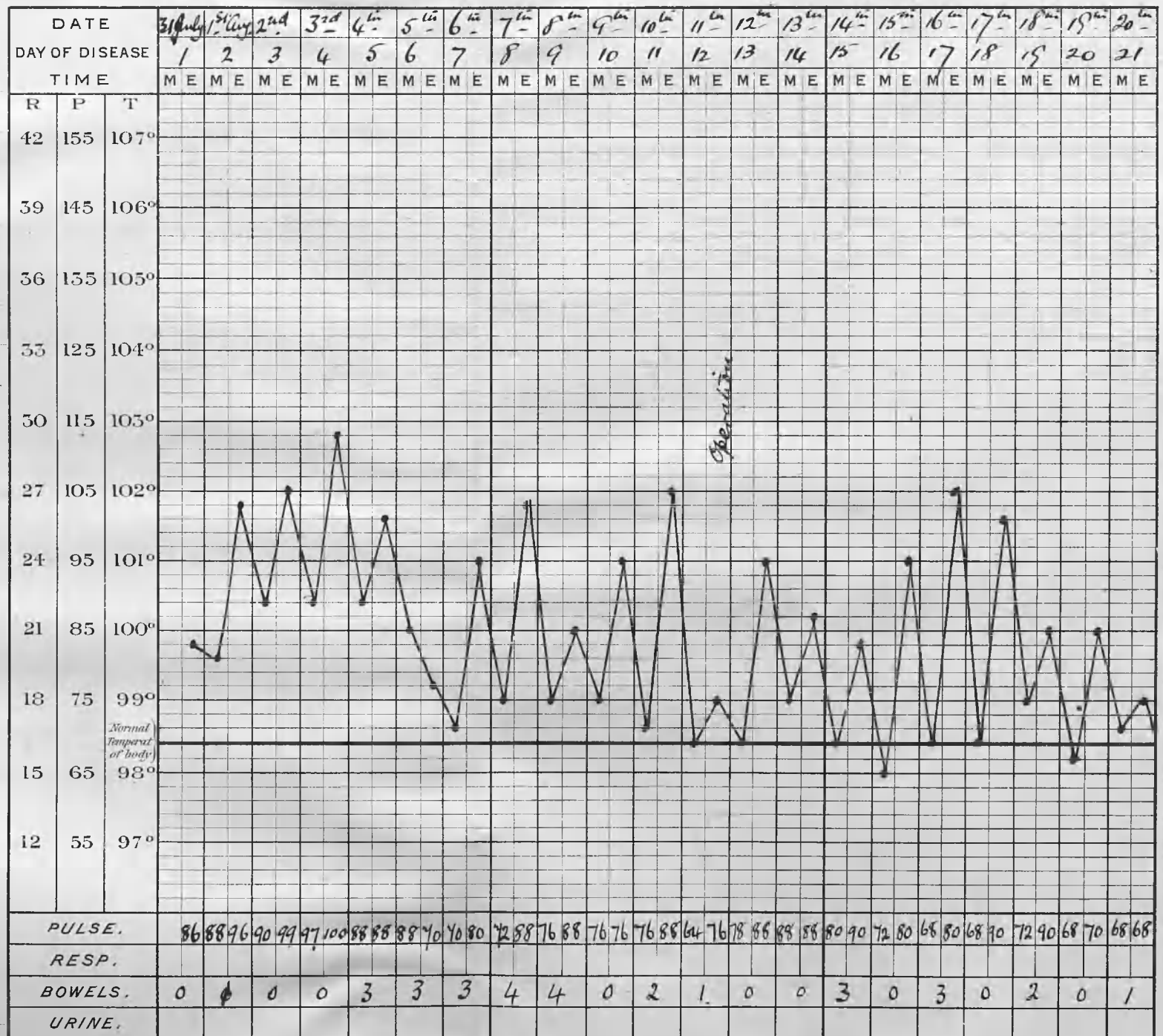
AGE 16

DIET

CASE BOOK Nº

DATE OF ADMISSION

RESULT



Down Bros' Hospital Temperature Chart. Entered at Stationers' Hall. 21, St Thomas's Street, London, S.E.

On examination of the abdomen it was found to be very tender to the touch and the slightest pressure in the right iliac region made the patient cry out with pain. There was increased resistance round the scar, and the percussion note was dull. The scar was three inches in length and was parallel to Poupart's ligament in its outer half. The pulse rate was 86 per minute and the temperature 99·8°.

Linseed meal poultices were ordered to the tender surface, no food of any kind was allowed, and Tr. Opii m 30 was given.

1st August. Patient had a restless night. The pain is very severe in the right groin. Tenderness continues Extreme. The tongue is furred & dry. An enema of soap and water was given and a copious motion resulted. Thereafter the pain was relieved for a time, but it returned with equal severity within an hour. Diet of beeftea and meat juice allowed – small quantities at frequent intervals. The pain being still extreme a hypodermic injection of Morph. Hydrochlor. gr ¼ and Strychnin Sulph gr 1/60 was given – the Strychnine being added to relieve flatulence.

2nd August. Patient had about two hours sleep in the night. He lies with his legs drawn up, but the left

can be extended without much discomfort. The temperature was 100·4° in the morning and rose to 102° at night. The hypodermic injection of morph. Hydrochlor. gr ¼ with Strych. Sulphat 1/60 was repeated at bedtime, as the pain and flatulence were both very severe.

3rd August. – Slept several hours last night, the hypodermic injection and the poultices having afforded much relief. The pain is a little better, and is now of a dull aching character. The patient can now extend both legs. The swelling is easily palpated today; it is becoming more distinct as its margins are more definite. It can be felt under the lower end of the scar above described, and from there it extends inwards to reach the middle line. The percussion note over its surface is entirely dull, and the skin over it and the margins of the scar continues very tender. The liquid diet was continued, along with Brand's Essence of beef, and peptonised milk. The temperature rose at night to 102·8°, but the pulse did not go over 100 per minute. An enema of Castor oil and olive oil was given.

4th August. Had a better night. Has passed much flatus, and the distention is much less. The tongue is a little cleaner. Patient feels generally more comfortable. The swelling is

still very distinct, but has not altered appreciably in size since last report. The tenderness remains very great. During the day three small slimy motions were passed as a result of the enema of oil last night, which had not acted previously. As the patients friends were getting anxious, Mr Dean, of the London Hospital was called in consultation. He considered it probable that the case was beginning to improve, and that resolution would occur in due course without any suppuration. He advised that no operation should be undertaken for the present, but that an attempt should be made in the quiescent period, ten days to a fortnight after the symptoms had disappeared, to remove the appendix. If however there was a recrudescence of symptoms after the present fall, he would recommend immediate operation. In regard to present treatment, he advised that the local application of heat should be discontinued, and that the skin over the appendix should be covered with lint soaked in lead lotion, so as to dry up the surface as soon as possible, and have it in good condition for the operation proposed. He ordered the enemata also to be stopped, and free purgation to be set up and continued until the symptoms subsided, by the following prescription ℞ Mag. Sulph. ℥ Sod. Sulph aa ℥ 4ss

Aq. Camph. ad ℥ss - ol et m. To be given every three hours so long as required to keep the bowels moving two or three times a day at least.

5th August. Patient had a fairly good night & seems better. The bowels moved twice in the night, the first motion being copious and oily, - evidently a further result of the oil enema - and the second containing some small solid pieces like grapestones. The tongue is cleaning nicely, but great thirst is complained of. The temperature has improved decidedly during the day.

6th Aug. Improvement maintained until the afternoon, when the temperature again rose to 101°. There is much distension again, and pain is very severe. He was given an injection of chych. Lineph. ℥ss at bedtime to assist in relieving the flatulence. The swelling has not yet begun to diminish in size, if anything it is slightly larger. The tenderness is still great.

7th to 11th Aug. During these days, - the eighth to the twelfth of the disease - the temperature fluctuated considerably from time to time, but on the whole it showed a striking resemblance to what was observed during the earlier days of the attack from the second to the sixth. The morning records were as a rule about a degree above normal, while the evening ones were usually two degrees or more

above those of the morning. The swelling had increased somewhat in size, but there was no fluctuation over it. It was still very tender.

11th August. Mr Dean was again called in consultation today. On examination of the abdomen he said he had no doubt there was pus present. He accordingly operated, cutting down upon the caecum in a line slightly internal to the old scar. The deeper tissues were somewhat oedematous but there was no trace of pus anywhere, although a careful search was made around and behind the caecum. Mr Dean accidentally cut into the peritoneal cavity, which he had not intended to open. This incision was packed with strips of iodoform gauze. The appendix was not seen at all; it was considered inadvisable to disturb the organs much in any thorough search for it. The purpose was of course to wait until the disease subsided, and in the quiescent stage to cut down upon it through the peritoneum and remove the appendix. The wound was packed with iodoform gauze and allowed to granulate.

For the next week there was very little change in the patient's condition. The fever continued unabated, the temperature still rising markedly at night. The

The Question of Continuous purgation in Appendicitis.

wound appeared to be doing well, although the caecum was projecting in it above the level of the surrounding skin. There was a good deal of oozing, but no sign of any purulent discharge. The general condition of the patient was very much the same as before the operation. With the exception of the day of operation and the next, the aperient was by the instructions of Mr Dean continued regularly, and it induced frequent evacuations.

At the end of the week, i.e. on the 18th the writer decided that as there was even yet no sign of improvement, something more must be done. From his experience in several cases the writer had a strong feeling that the continuance of aperients as in this case was a mistake, and quite possibly accounted for the long persistence of the symptoms. He accordingly ordered the salines to be stopped. The result was eminently satisfactory, as the chart will show. On the evening of the 18th the temperature was 100° — the previous night it registered 101·6° — the next night it was 100° also; on the 20th it was 99°, and from that point it continued normal. In other respects also progress was now uneventful, except that as the wound was a deep one, and was closing up very slowly, the writer on the 28th drew the edges together, freshened

The writer's opinion in regard to aperients.

them with a scalpel and inserted four silk stitches. A week later healing was complete.

This case illustrates how one may feel perfectly certain that pus is present around the appendix, and in that assurance operate, and yet find not one drop of pus. Judging from many points of view her doctor appeared quite justified in suspecting suppuration. The temperature chart especially appeared very convincing. The pulse rate was not a strong indication in this case for either the presence or the absence of pus. The swelling however was getting larger, although no fluctuation could be made out.

The writer has a pretty strong belief that the rise in temperature of the seventh day had a close connection with the adoption of the purgative treatment. It appears probable that if the salines had not been given, or had been given only once instead of regularly every few hours, the temperature would have subsided completely without relapse and reached normal by the eighth or ninth day. The purgatives were continued from the fifth to the thirteenth day of illness; during that time there was really no improvement despite the operation on the eleventh day, but immediately the purging was stopped

The position of the appendix in this case.

Case typical of second variety of appendicitis.

on the nineteenth, the temperature ceased to rise to such a high level as previously; within two days it was under 99°, and did not rise again.

The reason why the appendix could not be found was probably explained by the position of the swelling. This extended more internally than is usually the case, and its internal margin reached the middle line. In the attack which this patient had two months later, the swelling was found to pass over the middle line to the left, where the greater part of it was situated. This appears to show that the appendix was in an unusual position, its direction being probably from its attachment to the caecum directly inwards towards the left side of the body. It could not therefore be reached by the ordinary incision over the caecum.

II Cases in which there is localised peritonitis, resulting in the formation of an abscess.

J. S. - aged 38 - was a great sufferer from asthma, and a confirmed dyspeptic. On 9th Jan. 1897, in the early morning, he was seized with violent pain in the abdomen, accompanied by severe and repeated vomiting. On our first visit his temperature was 99·4°, and his pulse 96, full, strong, and regular. The

DISEASE

Appendicitis with localised Abscess

NOTES OF CASE

NAME J. S.

AGE 38

DIET

CASE BOOK Nº

DATE OF ADMISSION

RESULT

DATE	9/1/97	10 Jan	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
DAY OF DISEASE	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd
TIME	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E	M E

R	P	T
42	155	107°
39	145	106°
36	135	105°
33	125	104°
30	115	103°
27	105	102°
24	95	101°
21	85	100°
18	75	99°
		(Normal Temperat of body)
15	65	98°
12	55	97°

Operation

PULSE.	96 100	90 92	94 98	98 108	106 112	96 98	92														
RESP.																					
BOWELS.	0	0	0	0	0	0	0	1													
URINE.																					

Temperature Centigrade

42° 41° 40° 39° 38° 37° 36° 35°

Down Bros' Hospital Temperature Chart. Entered at Stationers' Hall. 21, St Thomas's Street, London, S.E.

pain was most intense in the right groin, and from there upwards and inwards towards the umbilicus. It was described as occurring in paroxysms, and of a cramp-like character. Patient lay on his back with his legs drawn up, as this was the most comfortable position he could find. The whole surface of the abdomen was very tender to the touch, but the tenderness was most marked in the right iliac region. There was some distension in the lower half of the abdomen. There was no localised swelling to be discovered in the right iliac region. The bowels had not moved for two days previously.

Hot fomentations were ordered over the right lower quadrant of the abdomen. As the pain was so intense morph. hydrochlor. gr ¼ was given hypodermically. At night the condition was about the same. The pain was very severe, but the injection had given relief for a short time. The fomentations had been welcomed. Vomiting had occurred several times

On the first visit the question arose as to whether the case was one of appendicitis or of intestinal obstruction. The pain & vomiting and acuteness of the onset might have signified either of these although in obstruction perhaps collapse would have been a prominent feature. The

patient had never had appendicitis before so there was no assistance from the history. After twelve hours there was much fulness in the right iliac region and the diagnosis was scarcely in doubt.

10th Jan. Patient had no sleep in the night. On examination there is found to be considerable distention of the lower part of the abdomen. It moves little during respiration, and the muscles on the right side of the abdominal wall are very rigid. The percussion note is dull over the region of the appendix, and here also there is a feeling of increased resistance on palpation. The pain is quite localised to this region today. Tenderness is extreme on pressure over McBurney's spot and a short distance below that. Vomiting has occurred twice in the night. Constipation continuing, an enema was given, but without result. No more morphia was given, but a mixture containing bismuth carb. and sod. Bicarb. to endeavour to allay the sickness. Liquid diet only was allowed, consisting of beeftea and meat extracts with some peptonised milk.

In the evening there was not much change. An enema of turpentine followed by soap and water was given; it appeared to relieve the distention to some extent

but it brought down no foecal matter. A hypodermic of Strych. sulph. gr 1/60 was given to assist to empty the bowel of flatulence.

11th Jan. Had restless night. Pain extreme, and not any better. Vomited once in the night, the vomit being greenish. The tongue is dry and furred. There is great thirst. There is again much distension of the abdomen. Tenderness in the right iliac region is extreme. The swelling there is more prominent than before; it is firm and has fairly definite margins at its inner and outer sides. It extends along the upper half of Poupart's ligament, a little internal to that structure. It is about 1½ inches in breadth.

The rectal tube was employed several times during the day and it to some extent relieved the flatulence. As almost everything taken was vomited, patient was fed by nutrient enemata of meat essences, eggs, and peptonised milk.

12th Jan. Restless night again. Pain still very severe. The bowels have not yet acted. Vomiting recurred again in the night. Everything taken is rejected. The nutrient enemata are continued. The swelling is larger to-day and extends further downward and inward than yesterday, the area of percussion dulness being therefore increased. The tenderness on pressure is most extreme. In the evening the condition was not

much changed. Patients face was drawn and haggard and his tongue dry and trickly furred. He lies still with his legs drawn up to relax the abdominal wall. He has vomited several times today, the vomit being yellow in colour and having a most offensive odour. The bowels have not yet acted; an enema given in the morning was without result.

From the severity of the symptoms and their continuance, and more especially from the fact that the swelling appeared to increase in size each day although there was no fluctuation, it appeared certain that suppuration had occurred, and it was therefore decided to have an operation performed as early as possible on the following day.

13th Jan. The swelling is still larger and more prominent than yesterday. It extends from Poupart's ligament inward to an inch from the middle line, and almost reaches the umbilicus on its upper side. It appears to be softer to the touch today, but there is no fluctuation. The pulse is 106 per minute. Vomiting occurred again in the night, and the vomit had a suggestion of faeculent odour. Examination per rectum revealed no new fact.

Mr Harrison Cripps was called in consultation, and advised immediate operation. He accordingly cut down in the usual incision parallel to Poupart's ligament

upon the caecum. The tissues were found full of oedema, and on raising the peritoneum gently from the iliac fascia, a stream of foul-smelling pus gushed out. The abscess cavity was then carefully explored with the finger, but no foecal masses or calculi could be found. The peritoneum was not opened, as the pus was situated behind the caecum, and was therefore extraperitoneal. The cavity was gently irrigated with weak hydrarg. perchlor. lotion. The appendix was not seen or felt during the operation, and it was not considered advisable to search too deeply for it. Mr Cripps then put two drainage tubes into the wound, and inserted three stitches. The wound was then dressed with double cyanide gauze and wool. Patient stood the operation well, and soon got over the chloroform sickness 14th Jan. Patient had a fair night, and slept about four hours. The writer sat all night with him, and watched his pulse so gradually down to 96 from 112 as it had been after the operation. The vomiting has ceased. Patient however feels most uncomfortable from distension of the abdomen. The rectal tube was used frequently, and gave considerable relief. Food was taken by the mouth today and all was retained. Beeftea and beef extracts with Liebig's

Symptoms of Suppurative Cases.

extract and borril were given in rotation in small quantities every two hours.

15th January. Feels better. There is still much distension, and as yet no motion has occurred. The temperature came down to 99·6 yesterday and is 99·4 today. The wound was dressed today as there was very profuse discharge.

16th Jan. Today examination discovered faeces in the rectum; a glycerine enema therefore was given and a large motion resulted. After this the distention began rapidly to subside. After this, progress was uninterrupted. On 8th Feb. as there was still a very large wound where the drainage tube had been inserted, the edges were brought together and held in position by two deep buttonhole sutures. Healing was thereafter rapid.

Taking this case as fairly typical of our second class of cases, we see that to begin with the symptoms may be exactly the same as they are found in cases that end in resolution. As a rule they are more severe, but on the other hand they may begin very mildly and insidiously. There is nothing distinctive for the first few days. Rigors are very rarely found, the writer has never met with them in cases of this kind. It is therefore seldom possible to tell before the third or fourth day whether suppuration will

occur or not. We must therefore in our diagnosis rely more upon the general course the case takes than on any particular symptoms to be found at the commencement. Thus in the suppurative form the temperature as a rule rises high to begin with, and remains at, or nearly at, the same level for perhaps six, ten, or, if no operation be performed, fifteen or more days. If the case is to subside without suppuration the temperature as a rule is found to have fallen considerably by the fifth day. Again suppuration is often indicated when the temperature has by the fifth day fallen a degree or more, and then begins to rise again on the sixth or seventh day. An apparent improvement, followed by a recrudescence of the symptoms, is a not uncommon feature of the suppurative form. Of course to this there are many exceptions, as for example, the case of P. B., above described. The pain is usually more severe from the outset than in the non suppurative form. It is more persistent and may be extreme at a late stage in the case. Vomiting is more troublesome and often more persistent than in the first class of cases. Thus in the case of J. S. just described the vomiting continued more or less until the operation on the sixth day. At the last it was stercoraceous, but this

is a very uncommon feature. If there is Constipation, it is more severe than in the non-suppurative form of the disease. Thus in the case of J. S. it was so severe as to suggest intestinal obstruction. Most authorities say that Diarrhoea is sometimes met with in cases in which pus forms, but the writer has invariably found constipation in his cases.

The pulse as a rule runs higher in the suppurative cases, and taken along with other signs is of great importance in coming to a diagnosis.

Tenderness of the region over the caecum and appendix is much more marked than when the case ends in resolution. When there is much pus it is most extreme. Rigidity of the abdominal wall is also more marked in suppurative cases. Dulness to percussion is more extensive and more absolute.

The swelling formed is larger and may show rapid enlargement from day to day. If the tumour is very quickly formed and is large and prominent about the third day, suppuration is very probable. Fluctuation may be present and confirm the diagnosis, but it appears only when the case has run some time, and the pus is near the surface,

Anomalous Cases.

Case of "Ambulant Appendicitis."

or is situated in front of the caecum. Oedema of the skin and superficial layers of the abdominal wall occurs in cases of some standing.

In the suppurative cases too as the days pass, the patient fills more rapidly, thin, his face pinched and drawn, his eyes sunken, his general look anxious. His tongue fills very dry and covered with dirty thick fur; his legs continue drawn up in the bed, and he appears utterly prostrated. Sometimes an Examination per rectum will discover fluctuation. Pain in the thigh is commonly complained of, and may be very severe. Phlebitis in the leg is sometimes met with.

Anomalous features may lead to much difficulty in this form of appendicitis. Thus the pus may form very rapidly and may surround the appendix after only forty eight hours. Occasionally the temperature remains normal, although the pus may be forming in large quantities. This probably accounts for those cases which do not come for treatment until the suppuration is far advanced. Thus when the writer was acting as Surgeon to the Hounslow Hospital a man walked in one day complaining of a great swelling in his

Neglected Cases of Appendicitis in childhood.

right groin. He said he had been unable to work for three days on account of pain in his side. On examination there was found much swelling and oedema over the whole of the right lower quadrant of the abdomen, and at the margin of the rectus muscle fluctuation was distinct. Patient was put to bed, and next day the abscess was opened by a simple incision. A drainage tube was inserted and at least eight ounces of pus came away. The wound healed in a few weeks and patient was dismissed in good health. The writer also has notes of a similar case in a child who was brought to the out patient room of the Birkenhead Childrens Hospital in March 1895, when the writer was House Surgeon. Her mother brought her saying she could not walk, and had been sick on several occasions during the ten days before. The child was five years old. She looked ill and thin. On examination the skin and superficial tissues from Poupart's ligament to the umbilicus were swollen and oedematous, and about the middle of this area fluctuation was evident. Dr Pinkerton, Surgeon to the Hospital incised the abscess and much pus escaped. The child was for a week in a precarious condition, but with careful nursing

Reference :- (R.) Treves' "Peritypplitis", page 33.

made a good recovery.

Another difficulty in recognising purulent appendicitis may arise from the fact that the appendix, and consequently the abscess, may be situated in the pelvis, and the signs of pus in the right iliac region may be absent. Or sometimes the abscess may contain gas formed by decomposition of the pus, and the percussion note over it may be resonant.

If the case is not operated on, the abscess may point in various situations, which have already been mentioned in speaking of the pathology of the disease. If it is opened and the pus set free, the abscess cavity closes up in a few weeks, the time depending of course on the size of the cavity which is left to granulate. In the case of J. S. above described, healing was complete in about five weeks. It is very unusual to have a recurrence of appendicitis after the abscess has been thoroughly evacuated; when that has been done we have nearly always cured the patient. Treves (A.) says he has known of only two cases of recurrence after an abscess has formed and been drained. The writer has had one such case, viz— that of P. B. above described. This youth had had

Case of non-suppurative Appendicitis following two years after an appendical abscess was opened.

Case of "Fulminant Appendicitis"

an appendical abscess opened two years before the attacks described, and the cavity was allowed to heal up from the bottom. The appendix had not been found at the operation, and appendicitis recurred on two occasions, but in neither of these did suppuration occur.

III Cases characterised by general peritonitis.

On 14th Feb. 1894, while house surgeon at the Surrey Dispensary, the writer was summoned to see a man, aged fifty, who had taken suddenly ill with severe pain in the abdomen. On arrival the writer found him in a state of collapse. His pulse was thready and small and difficult to count, but somewhere about 126. The temperature was 97·6°. He lay in bed with his legs drawn up, and his face was rather livid and his skin moist with cold perspiration. The abdomen was much distended all over, and it did not appear to move in respiration. It was very tender to the touch. I could make out no swelling in the right iliac region, but thought the tenderness was most severe in that area. Patient had been sick several times. The history obtained from his relatives was that two days previously he had complained of paroxysmal pain in the right side of the abdomen and had vomited once or twice. Thinking he had

Colic he took a dose of castor oil which acted soon afterwards. The pain was relieved for a short time but returned the next day, and became constant and more severe towards evening. His wife put on some hot application, but he got no better and vomiting was very troublesome. The writer was therefore sent for on the following morning. This being my first experience of such a severe case, it did not occur to me that the appendix was the cause of the symptoms, but I diagnosed peritonitis and recommended immediate removal to Guy's Hospital which was only a short distance off. There the abdomen was opened within a very few hours. At the operation the appendix was found to be gangrenous near its base and almost detached from the caecum. It was surrounded by foul smelling pus, and the peritoneum generally was inflamed and covered with thin lymph and some pus. The patient scarcely rallied from the operation, and died the same day.

Such cases as this are usually extremely sudden in their onset. The pain is very acute, and collapse is a prominent feature. If operated upon, the appendix is found to be perforated, or gangrenous, or it has suddenly ruptured and discharged the contents of a cyst in its body into

Symptoms of Cases with general peritonitis.

Anomalous Cases.

Reference:-(A.) Treves' "Peritypholitis," page 27

the peritoneal cavity. Or as in the case cited the patient may have been ill for a day or two with what may appear a mild attack of appendicitis, and suddenly collapse and other symptoms as above may supervene – indicating probably rupture into the peritoneum before sufficient time has elapsed for the formation of sufficiently strong adhesions.

If in these cases the initial collapse is survived the temperature runs high – to 103° or 104° or higher. The pulse continues small and rapid, and we have all the ordinary symptoms of peritonitis. Distension is always a prominent symptom. If this is unaccompanied by swelling or dulness in the right ilium it should lead to a suspicion of general peritonitis. Vomiting is always severe and persists to the end of the case.

Treves (A.) and others have reported a few cases in which peritonitis originating in the appendix was not accompanied by tenderness or distension of the abdominal wall, and in which the temperature remained normal or subnormal. In these the chief symptoms have been those of severe septic poisoning – but certainly they must be extremely difficult to diagnose.

Although all the cases of appendicitis may be classed in one of these three divisions, it is necessary to say

Relapsing Appendicitis.

Chronic Appendicitis.

a few words at this point on those cases that are usually grouped together as Relapsing Appendicitis. In this form there are different attacks which recur at very uncertain intervals. These attacks may be very like each other in features and in course. Between the attacks the patient may enjoy perfect health, although as a rule he suffers much from dyspepsia or troublesome constipation. In some cases the patient may never quite regain good health, but he may continue to have occasional pains in the right side of the abdomen; the part may remain sensitive to pressure, and there may even be felt some swelling or hardness about the region of the appendix. The patient in these last cases may be a chronic invalid, and be confined to his bed or couch unable to walk. Sometimes these cases in which there is never complete recovery between the acuter attacks are grouped together as chronic appendicitis. But in the forms of Relapsing appendicitis as usually seen the patient is quite well between the attacks, and can go about as well as ever. Some patients have these attacks at very regular intervals. A case known to the writer has already been referred to, in which the attacks appear about four times each year. The attacks may follow each other very rapidly, as

Case of rapidly recurring attacks.

The Probability of Recurrence.

References:- (A.) Treves, Op. Cit. page 42—
(B.) Hawkins, "Diseases of the Vermiform Appendix," p. 112
(C.) Deaver, Treatise on Appendicitis, page 179.

in the case of Mrs B. which will be described more fully later on. Her first attack occurred in May 1900, the second in August, and the third in November of the same year — this last was soon followed by the symptoms of pelvic cellulitis to which she finally succumbed. P. B. as above mentioned had an attack of appendicitis with localised abscess in 1898, he remained well until July 1900, when he had a severe non-suppurative attack followed by another two months later.

After an individual has had an attack of appendicitis ending in resolution he is very likely to have a recurrence unless the vermiform appendix has been removed by operation. The probability of recurrence of a first attack is very differently estimated. Treves (A.) says about forty four per cent of the cases recur; Hawkins (B.) found recurrence in twenty three per cent of cases at St Thomas's Hospital. American writers put the percentage at a much higher figure. Mrs Deaver (C.) says sixty seven per cent of his cases were recurrent ones. In the writer's experience of thirty six cases, twenty one had another attack either before or afterwards, that is, a recurrence percentage of fifty eight. The recurrence is most likely to happen within six months; its probability gets less as time goes on. In recurrences there does not seem to be

Pathology of Relapsing Cases.

the same danger of general peritonitis, the serous membrane after each attack becoming better able to resist the poison. Attacks of general peritonitis are thus as a rule in first cases.

When attacks of appendicitis have occurred several times in the same individual, the patient frequently appears to know when an attack may be expected, and sometimes by rest and careful dieting he may to all appearance make the attack abortive. Such patients frequently become hypochondriacal, and are constantly in fear that they may be ill again. They talk much about their health, make the most of small ailments, and are afraid to do anything unusual lest it bring on an attack.

As regards the pathological lesion usually found in the appendix in these cases, it would appear to be commonly a cystic dilatation of some part of the lumen due to chronic inflammatory action, which has caused a stricture at some point, and allowed the formation of a cyst on the distal side. Or again the appendix may be bent upon itself, and the distal part dilated. Sometimes the appendix is found buried in adhesions, or occupied by a concretion, or occasionally it has in these cases been found perforated and surrounded by an abscess.

Complications and Sequelae of Appendicitis.

The Complications and Sequelae of appendicitis are numerous. Of these Intestinal Obstruction of various degrees is one of the most common. It appears to be most frequently met with in cases associated with the formation of a localised abscess. In such cases, much lymph is thrown out to hold the coils of bowel together and form the wall of the abscess. If after the pus is evacuated this lymph does not escape, or if the adhesions formed by it are not completely separated, the coils get firmly matted together, and more or less obstruction results. There is a good specimen of this condition of the intestines in the museum of the Royal College of Surgeons. It is a mass about twice the size of a fist consisting of coils all matted up in inextricable confusion. One can understand how in such conditions obstruction is a frequent consequence. The writer has met with several cases in which, no doubt as a result of a minor degree of this matting process, troublesome constipation and general irregularities of intestinal action have persisted for years after an attack of suppurative appendicitis.

Pylephlebitis is an occasional complication. It is due to thrombosis of the small branches of the superior

mesenteric vein. It may result in the formation of a large hepatic abscess, or of a multitude of small ones. It is usually found in cases in which an appendical abscess has been left for a long time untreated, in which case the pus finds its way upwards along the ascending colon.
Lung Complications such as Pleurisy and Pneumonia sometimes occur during appendicitis. Empyema has been reported in a few cases to have been due to rupture of an originally appendical abscess through the diaphragm, and abscess and gangrene of the lung has arisen in the same way.
Thrombosis of the right iliac vein occasionally occurs in appendicitis. Haemorrhage may bring some cases to a fatal termination. It is usually due to necrosis of the walls of the iliac or deep circumflex vessels.
Faecal fistula is not uncommon after an appendical abscess has discharged. It may open upon the skin or may enter one of the viscera, such as the bladder or rectum. After operations, external fistulae may result from unsuccessful suturing of the base of the removed appendix.
When appendicitis occurs during Pregnancy, it becomes much more dangerous than at other times,

Cases of Appendicitis during the Puerperium.

as abortion is said to occur in about forty per cent of such cases. The writer has not met with any complication of this nature, but he has had trouble in two cases that occurred during the puerperium. In one of these, - E.R. - a lady aged twenty seven, the symptoms of appendicitis began to show themselves five days after delivery. There was for several days much doubt as to whether the case was not one of puerperal peritonitis although the labour had been a fairly easy one and every precaution had been taken to avoid sepsis. The patient had had a previous attack of appendicitis, and this originally suggested the diagnosis. The symptoms subsided in five or six days, and the appendix was removed safely in the quiescent stage a few weeks later. Inflammation of the female pelvic organs is a complication which has frequently arisen in appendicitis. The appendix sometimes extends into the pelvis, and if inflammation or abscess occur in connection with it, the surrounding organs become implicated in the pathological processes. Fistula into the pelvic organs has already been mentioned, but the following case which occurred in the writer's practice shows how the ovary may

Case of Pelvic Inflammation following Appendicitis

also be affected:— Mrs Q., aged 34, had three separate attacks of appendicitis during 1900. Each one lasted about a week, and the third was more severe than the other two. After the third attack the writer strongly advised her to have her appendix removed during the quiescent stage. She hesitated, and her friends advised her to have special advice on the subject. She therefore in December 1900 consulted Sir Thos. Barlow, who gave her instructions in regard to her diet and the regulation of her bowels and other matters which he hoped would prevent recurrence of the appendicitis. He thought therefore that removal of the appendix was unnecessary. Mrs Q. therefore declined the operation. During December 1900 and the early days of January 1901 she was in indifferent health with much pain occasionally in the left iliac region. This she always herself attributed to "indigestion." On 5th January signs of inflammation in the pelvis appeared, with high temperature and rapid pulse. Prof. Herbert Spencer was called in consultation. On examining per vaginam, he found the uterus fixed and the tissues around it much swollen. There was much pain caused by examination per vaginam, and also by deep pressure on the abdomen just above the pubes on both sides, but more especially on the

left. There was fulness in Douglas's pouch. Prof. Spencer diagnosed pelvic cellulitis. He advised rest in bed, and douching with hot water three times a day per vaginam, expecting that suppuration would occur and the pus escape by the vagina. This treatment was carried out. Patient suffered great pain, for which morphia suppositories had frequently to be used. On 19th January the writer was called in haste to see her. He found her collapsed, the face blue, the temperature 99°, and pulse-rate 126 per minute, very soft and easily compressed. With stimulation however she improved and revived wonderfully. The writer thought it might now be advisable to undertake an operation with a view to finding out the exact conditions present in the pelvis, and giving exit to any pus there might be there, and summoned Prof. Spencer for that purpose. Dr Spencer however thought operation inadvisable for the present. After about six weeks time the pain began to diminish and the temperature, which had been of the hectic type, to remain nearly normal. Patient had become very thin and wasted, but her appetite then returned, and she was able to get out a little each day in a bathchair. Improvement continued for about two months. On 6th May however she was again seized with severe pain in the left groin, which

was found to be very tender to the touch. On examination per vaginam the uterus was found more movable than formerly but there was considerable swelling on the left side of the cervix, although no fluctuation could be made out. The hectic temperature returned. Patient was kept in bed again and the hot douches renewed as before. From this date she rapidly lost strength. Prof. Spencer examined her several times, but could not find the situation of the pus suspected to be present. On 24th May swelling and oedema was discovered in the left side of the abdomen, and Prof. Spencer made an incision in the left iliac region just above Poupart's ligament. About two drachms of thick cheesy matter was removed, and a drainage tube was inserted. About 3rd June the pus became much more liquid and flowed more freely. Meanwhile the pain was very severe & patient had to be kept more or less under the influence of morphia. She rapidly lost flesh.

19th June Patient is in violent delirium. Pulse 106 and temperature 102·4°. Has to be forced to take nourishment

26th June Patient in acutely maniacal state. The discharge has now stopped to flow from the incision in the left iliac region

Patient continued delirious until 11th July when

The Appendix in the above case.

Differential Diagnosis of Appendicitis.

she died. The postmortem Examination was made next day. The appendix was found attached to the caecum at its lower and inner side. In length it measured 5½ inches, and it stretched down into the pelvis where it was firmly adherent to the anterior surface of the rectum. Its wall was very much thickened and it felt like a thick fibrous cord in most of its extent. Its end however was dilated and formed a cyst the size of a small marble and contained some thick muco-purulent matter. The pelvic peritoneum was much thickened. The bladder, uterus, and rectum appeared quite normal, as was also the right ovary. But the left ovary was enlayed, and displaced into the pouch of Douglas and adherent to the rectum. On Examination it was found to be one mass of suppurating tissue.

It is difficult to understand why it was the left ovary that was involved in the suppuration, and not the right. The inflammation in the appendix had evidently caused infection of the pelvic peritoneum in which matter formed which ultimately got exit in the incision in the left iliac region.

The <u>Diagnosis of Appendicitis</u> is often a matter of great difficulty during the first twelve hours or more. One may feel fairly confident of his diagnosis if

there are found the following three most typical symptoms viz.- (1) Acute pain in the abdomen which has supervened suddenly in a person of hitherto good health.

(2) Tenderness on pressure over the situation of the vermiform appendix, and

(3) Rijidity of the abdominal wall over the lower part of the right side. One may be still more positive if, after four or six hours have elapsed, he finds that the pain has become more localised, and more definitely in the right iliac region.

There are however other severe abdominal affections which commence with acute pain and tenderness, and the rijidity is not always sufficiently marked to establish the diagnosis. The more common difficulties will be here noticed.

Intestinal Obstruction. This begins with sudden pain, vomiting, and collapse. The pain is more severe, it is at the site of the obstruction or at the umbilicus, and does not become localised in the right iliac region as it does in appendicitis. The vomiting is more severe, and soon becomes feculent. Constipation is absolute and continues throughout. The temperature does not run up so soon as in appendicitis. Distension is earlier

in appearing, is more severe and persistent. When due to intussusception a tumour may be made out in the right iliac region, but it is not so tender as the swelling in appendicitis, and there is also discharge of blood and mucus from the rectum.

Renal Colic may be difficult to distinguish from appendicitis at its onset. But in renal colic the pain shoots downward towards the bladder and testicle; there is blood in the urine; the tenderness is not marked in the right iliac region but over the kidney, and the temperature remains nearly if not quite normal.

In Hepatic Colic the writer has never had much difficulty in distinguishing it from appendicitis. The pain is situated above the umbilicus and radiates backward between the shoulders; the tenderness is over the gall-bladder, and not in the right iliac region. The vomiting is a severe symptom and is accompanied by a cramplike sensation over the stomach. The temperature remains normal, and jaundice usually soon appears.

Membranous Colitis may simulate appendicitis for some time. But the writer has never known the pain to be so severe in this affection as is usual in disease of the appendix. The pain is over the caecum, but if

Case of Perforation of Gastric Ulcer, at first resembling appendicitis

extends upwards over the ascending colon. Usually the voidance of membrane and mucous flakes will clear up the diagnosis.

Perforation of a Gastric Ulcer has frequently been confused with appendicitis of the fulminating kind, where the appendix has suddenly become perforated or gangrenous. But in this complaint although the pain is general over the abdominal surface, it is most severe above the umbilicus and not in the right groin. The distension is more marked in the upper part of the abdomen. I have found the pain more constant, and as a rule more severe than in appendicitis. If the description of the onset can be got, it is usually found that the pain came like a shock, was agonising, and was felt at some spot over the stomach in the epigastrium, but became general over the abdomen some time thereafter. The writer was summoned to see, A. M., a girl of 17, on 4th April 1901, about 12·30 p.m. About 11 A.M. she had been washing dishes, and suddenly felt an agonising pain in the epigastrium, became faint, and fell down on the floor. She was carried upstairs to her bed. On arrival I found her in great pain, her groans being heard all over the house. The pulse was weak and small, 90 per minute, and the heart sound very soft. On touching the epigastrium the pain caused was agonising,

over the rest of the abdomen it was severe, but could be borne. There was considerable distension above the umbilicus. The legs were drawn up, and any effort to extend the knees caused increased pain. Patient had taken her usual breakfast of tea, egg, and bread and butter, but had been sick after it. She had not vomited any blood with it. She was very anaemic. She was not at first able to give me any statement in regard to her health before this illness. Hot fomentations were applied to the abdomen. Morph. Hydrochlor. gr ¼ was injected, but the pain not being appreciably relieved in half an hour, the injection was repeated. The writer saw patient again within two hours. The pain was slightly better; it was now most marked above the umbilicus and was not marked in the right iliac region. There was considerable distension; the pulse was now 112 and temperature 100·2°. The diagnosis of perforation of a gastric ulcer was now made with confidence. Patient was sent to the Great Northern Hospital, where within six hours Mr Mowser White opened the abdomen. He found a small perforation, measuring ⅛ by ¼ inch, on the anterior wall of the stomach about one inch from the attachment of the small omentum. He folded and sutured the stomach wall over the perforation and washed out the abdomen with normal saline solution. Patient

Case of Rupture of Tubal Pregnancy, at first resembling appendicitis

made an uninterrupted recovery.

In such cases as this the diagnosis is a very difficult one at the first visit; but if the patient is watched for an hour or two, or is seen again within six hours there is not as a rule much difficulty.

Rupture of a Tubal Pregnancy has on one occasion been to the writer difficult to diagnose from appendicitis at its commencement. The writer was summoned in haste on 1st July 1897 to see a woman B. H., aged 25, who had fallen down in a fainting attack in a baker's shop. On my arrival she had been carried into the bedroom and laid on the floor. She was unknown in the neighbourhood, and as she was unable to speak, one could not get any assistance in making a diagnosis. She was quite collapsed, her pulse could not at first be felt; but after friction on the praecordial region it was made out to be 106. The abdomen was distended, and very tender to the touch. The distension was chiefly in the lower right abdominal region, and pressure here gave patient extreme pain. On deep pressure a hard swelling was evident. The writer's first suspicion was rupture of the appendix, but as patient did not revive from her collapse in spite of restoratives, and became more and more blanched, and the pulse again in-

perceptible, the possibility of haemorrhage from a ruptured extrauterine foetation was thought of. In any case it was decided that the only chance of saving patient's life was immediate operation. She was therefore removed to Stourbridge Cottage Hospital, and the abdomen opened. The swelling mentioned above was found to be the head of a three months foetus. The abdomen was full of blood clot. Two pints of saline solution were transfused into the left basilic vein. Patient however died within an hour after the operation was completed.

A case like this is often indistinguishable at the commencement from an appendicitis of the fulminating kind. One must not wait too long to complete his diagnosis, for in either case immediate operation is indicated, the success of which is often dependent on the shortness of the interval that elapses before it is carried out.

Typhoid Fever cases, if at all like the ordinary type, should not be confused with appendicitis. Typhoid comes on insidiously, the temperature rising in gradual daily steps. Appendicitis comes suddenly with severe pain. But in cases of typhoid fever which are very mild to begin — "ambulant" cases — it is possible that the patient may go about his usual work until suddenly an

Case of Rupture of a Typhoid Ulcer, indistinguishable from Appendicitis of the fulminant type.

ulcer perforates, and the patient collapses, and has pain, localised tenderness of the abdominal wall, and many other symptoms of fulminating appendical perforation. The writer saw a case of this kind with Mr Mower White in the Great Northern Hospital in April 1901. A woman, C.P., aged 36 was taken suddenly with severe pain in the abdomen, and fell down on the street. On being received in the Hospital she was collapsed, with temperature 97·2°, and pulse 110 per minute, thin and small. Respiration was very rapid. Vomiting was severe and continuous. The abdomen was considerably distended and very tender to the touch. No swelling could be made out in the right iliac region, but Mr White diagnosed rupture of the appendix and decided to operate at once. The appendix was found to be perfectly healthy, but a large perforation was discovered in the wall of the ileum, and there was faecal matter in the peritoneum. This was carefully cleansed, and the perforation closed with sutures, and to give it additional support, a strip of omentum was fixed round half the circumference of the bowel. After the operation patient was very collapsed, but she ultimately improved. Her temperature rose to 103°, and came down to normal again with gradual remissions, which

were suggestive of typhoid fever. One or two rose spots were noticed on the abdomen, and Widal's reaction was obtained.

In this case it was impossible before operation to diagnose the condition, but it was not important to do so exactly because in any case laparotomy was at once called for.

Inflammations in the female pelvic organs are often difficult to distinguish from appendicitis. Thus an inflamed right ovary may deceive the practitioner. In such case the onset is not so abrupt and there is not the rigidity of the lower abdominal quadrant which is found in appendicitis. When the appendix is situated in the pelvis it may give rise to pelvic peritonitis, as in the case of Mrs Q., described above, and it may be difficult to distinguish what symptoms are due to the appendicitis and what to the secondary pelvic trouble. This case too illustrated how when the appendix is placed in the pelvis, the pain is often referred to the left iliac region instead of the right, and in this way gives rise to much difficulty in diagnosis.

Tubercular Peritonitis may closely resemble appendicitis. For the diagnosis one must rely on the insidious onset and slow progress of such cases, although sometimes laparotomy alone will decide.

The Prognosis in Appendicitis.

Hip Joint Disease in children may be mistaken for appendicitis, but in this the onset is not so sudden, and the pain is most intense below Poupart's ligament.

Psoas or Spinal Abscess may for a time simulate appendicitis. But the history as a rule clears up the doubt, and there may be rigidity and curvature in the spinal column to make the diagnosis still more clear.

The Prognosis in Appendicitis. As has already been said, it is impossible at the commencement of an attack of appendicitis to say what will be the ultimate issue. The illness may begin quite mildly, and for the first day or two there may be every prospect that the patient will be well within a week or ten days, and then without warning symptoms of general peritonitis may appear, and carry the patient off. On the other hand cases that begin with tenderness all over the abdomen, and distension suggesting severe implication of the whole serous membrane, may rapidly improve, and end even without suppuration, or perhaps with the formation of a localised abscess. Of course such sudden changes in the course of a case are very unusual, but one must be prepared for any turn in events, and must explain the various

possibilities to the relatives of the patient. If the pain and tenderness are both only moderate, and the rigidity over the region of the appendix not very marked, we can usually say with confidence that the patient ought, barring accidents, to make a good recovery. If on the other hand, the pain and tenderness are both severe we must be prepared for the formation of a localised abscess at least, and the prognosis therefore is not so good. If the tenderness soon becomes general, and the distension increases, general peritonitis is probably present, and the outlook is ominous. If the pain is for a time severe, and then suddenly ceases — so that the patient may say he is much better — probably the appendix is gangrenous or even detached, and our prognosis must be a bad one. The prognosis will vary much according to the time at which we have been called in to attend the case. If we are summoned just after the first paroxysms of pain have begun, and we can order strict rest in bed, abstinence from food, and other important items of medical treatment, we can usually say the case should end well. There can be no doubt that suppuration is often averted by proper early treatment. If the patient thinks he has got colic

and goes about or continues at his work, he runs a great risk of perforation of the appendix, or of rupture into the peritoneal cavity of an abscess that may be beginning to form, but has not had sufficient time to allow the adhesions in its walls to become firm. The writer has no doubt that if the patient who suffered from general peritonitis, and whose case is described above had summoned medical assistance two days earlier his life would have been saved.

In making our prognosis in appendicitis we must remember the <u>possibility of a relapse</u>, and must warn the relatives that such an occurrence is met with in nearly half the cases. The frequency of recurrences has been discussed above (page 70). They are less likely to be met with if the patient has been treated by some weeks of rest in bed after the acute symptoms have subsided, and also if six months or more have been safely passed.

Another point to be remembered in our prognosis is that after an abscess has formed and been evacuated the adhesions formed around it may remain and give rise to troublesome constipation or irregularity in intestinal action, and perhaps occasional

Treatment of Appendicitis.

attacks of colic. These may continue during the rest of his life to remind the patient of his illness.

Lastly in the prognosis in cases of localised abscess the skill and experience of the operator count for a great deal.

Treatment of Appendicitis. There are two great lines of treatment in cases of appendicitis (1) The Medical, as followed by the great majority of British surgeons, and (2) The Surgical, the advocates of which are chiefly to be found in America, although recently the chief surgeons of Paris and other Continental schools have also announced their adhesion to this view. Of course both schools agree that in cases of general peritonitis due to appendical trouble immediate operation is the only reasonable treatment, and in cases where one is certain pus is present the proper course to pursue is to as soon as possible give it exit. Where the two views are at variance is in regard to the treatment at the very commencement of the illness in cases where you have the symptoms of appendicitis indicating perhaps only a catarrhal condition of the organ and some adhesive peritonitis around it. In such circumstances most British surgeons would

References :- (B.) Deaver's, "Treatise on Appendicitis," page 232.

by what could be done by medical measures — rest in bed, abstinence from food to begin with, and special restricted diet thereafter, local applications to the iliac region, and internal remedies — to hasten the resolution of the inflammatory products around the appendix, and check the pathological process in the organ itself. They would of course watch the patient carefully and if at any moment there were indications of general peritonitis or definite signs of pus formation they would operate without delay. If however all was found to go well and the attack subside within a few days, they would put off the question of operation for the time. If relapses occurred so that the patient was unable for work, or was constantly in fear of an attack they would advise him to have the appendix removed during a period of quiescence, so that the operation would be done at the most favourable time when the tissues were free from inflammatory processes.

The <u>Surgical method of treatment</u> may be best explained by quoting from a recent work on this subject. The author (A.) says "The most appropriate course to pursue in order that the best results be obtained is to remove the diseased appendix as soon as the diagnosis of appendicitis

References:— A. Dieulafoy in "La Semaine Medicale," Jan. 1899.

B. Transactions of Med. Soc. of London Vol. XXI.

has been made – provided the diagnosis has been made early and there are no complications that render immediate operation unjustifiable. The appendix should be removed so early in the attack that sufficient time can not elapse for the supervention of septic absorption, perforation of the appendix, or purulent peritonitis; and in those cases of a fulminating character, in which the transit from the initial symptoms to the inauguration of purulent peritonitis the result of perforation or gangrene of the appendix has been most rapid, almost instantaneous, early operation is all the more urgently demanded."

This method of treatment is almost universally followed by American surgeons. As representing the French school too Dieulafoy recently (A.) wrote, "This (medical) treatment should be entirely abandoned. Operation constitutes the only rational treatment of appendicitis." And among British writers the early surgical treatment is coming to be regarded with more favour than up to a short time ago. Dr Mayo Robson (B.) writing recently said, "Early operation, undertaken as soon as appendicitis is diagnosed, would lead to a far greater percentage of recoveries."

It is unfortunate that Deaver, the author above quoted, does not give in his book any statistics

Mortality after Immediate Surgical Treatment.

Reference :- (1.) "Appendicitis" by A.H. Tubby — chapter on "Prognosis Statistics," page 80.

of the mortality following his operations. The death rate where treatment by immediate operation is carried out is given by other surgeons, and is found to vary very much. Thos (A.) Wyeth operated on 364 cases and had a death rate of 18 per cent; Murphy had 194 cases with a mortality of 9·6 per cent and Morris had 100 cases and only 7 died with a death rate following operation varying in the hands of different surgeons from seven to eighteen per cent it is difficult to come to a very definite conclusion as to the proceeding. The results of operations in cases of appendicitis performed by American surgeons appear in many cases most brilliant. We may judge of them from tables giving results in cases where there has been general peritonitis. Thos (A.) McBurney had 74 cases and 64 recovered; Murphy operated on 33 cases and of these 16 recovered. This measure of success is probably partly due to the fact that as these surgeons are known to operate immediately in all cases of appendicitis, these cases of diffuse peritonitis are sent to them without delay, and consequently they have a better chance of success. In diffuse peritonitis the earlier the operation is done, the

Mortality of Appendicitis in British Hospitals.

British and American results compared.

References:—(A.) Treves' "Perityphlitis" page 53.
(B.) "The Early Treatment of Appendicitis," Hood page 24.

more hopeful will be the result.

The mortality in appendicitis as shown by the records of hospitals in this country is also found to vary considerably, but not so much as in the above records of surgical treatment. At St Thomas's Hospital (A.) Hawkins found the death rate for all classes of cases put together to be 14 per cent; at the Middlesex Hospital Fowler had 99 cases and 15 deaths; at the London Hospital according to Treves the mortality is 20 per cent, whereas at Guy's Hospital (B.), the records of the past thirty years show a death rate of 15 per cent. On the whole therefore it would appear that the death rate among cases treated by American surgeons by immediate operation (7 to 18 per cent as above noted) is lower than that prevailing among British hospitals where medical treatment is tried at the commencement. The probability however is that these statistics do not show the whole truth. It appears to be the case that in America cases are sent to the hospitals for operation which in this country would be regarded as slight ones, and would probably remain throughout in the hands of the general practitioner. How Treves estimates that the general mortality of all cases of appendicitis

The General Practitioner's View.

1.A.

Reference:- (A.) See page 70.

including slight and severe ones is not more than five per cent; so that if the death rate in the hands of the American surgeons operating immediately on all cases - slight and severe - is variously estimated at from seven to eighteen per cent the balance may still be on the side of the British school.

From the general practitioner's point of view it certainly appears a very drastic statement to say, as Deaver and others do, that every case should be operated upon as soon as diagnosed. In practice one constantly sees very slight attacks, perhaps lasting only two or three days, in which one could by no means feel justified in recommending operation. The risk of the attack itself seems so slight that the practitioner would greatly hesitate to advise his patient to submit to measures which involved even a danger expressed by a mortality of seven per cent. Of course we must remember the possibility of relapse. (A.) In regard to this Hawkins says his experience is that 23 per cent of the cases suffer relapse, Hunter puts it at 47 per cent, and Treves at about the same figure. Deaver says 67 per cent will have another attack; the writer found 58 per cent of his cases were recurrent.

Medical Treatment of an Attack.

But still even if we take Deaver's figure we ought to let our patient have his chance of being in the remaining percentage that have no relapse — or even perhaps of being in the still smaller percentage that have one relapse and are thereafter free from any signs of the disease. If relapses recur we can then advise our patient to have the appendix removed during the quiescent period — a proceeding which in the hands of Treves and other surgeons is attended by a mortality rate of only one per cent.

The <u>Treatment of an Attack</u>. Having put aside the idea of immediate operation in first attacks unless they are attended by general peritonitis we must first of all order our patient complete rest in bed. He must not only be told to keep in bed, but must be cautioned to move as little as possible from one side to another. Usually if the attack is a severe one this caution does not require to be repeated, because the patient finds his pain is least if he lies on his back or a little towards the right side with the right leg drawn up, and it gives him too much pain to move. Hot applications are to be applied over the tender area in the right iliac region; these the writer has invariably found

give more relief than an icebag which is recommended by some. If the case is a severe one, and the pain and tenderness extreme, so that there seems a probability that operation will be required, the writer uses dry heat, such as a light indiarubber hot water bottle. This as a rule gives much relief, and it is a great advantage to keep the skin dry and firm if operative proceedings will be required; hot moist applications soon make the skin sodden, and it then becomes impossible to make it aseptic. But if the case promises to be a mild one, I usually advise a large linseed meal poultice to be applied and changed every three hours or oftener if required. I have found nothing that gives speedier relief than first of all to paint the tender surface with glycerine of belladonna, or belladonna mixed with collodion, and then apply the poultice. Much of the drug is in this way absorbed, and besides relieving the pain over the appendix it has a slightly purgative effect which is valuable. I have known leeches give great relief, but always try the above application first. Blisters, iodine, and other counterirritants are in the writer's opinion better avoided; they also prevent proper cleansing of the skin in case

of operation.

The diet during an attack of appendicitis ought to be for the first day or two extremely limited. The writer is in the habit of allowing no food at all during the first eight to twelve hours. As vomiting is usually present the patient understands this treatment and does not complain. After twelve hours if vomiting has ceased he can have some liquid food, such as hot beeftea with the fat carefully removed, extract of beef in hot water, or perhaps a little weak tea. Not more than two ounces should be taken at a time, but it may be given every two or three hours. In my first few cases I allowed milk, or milk with equal parts of hot water, but the milk often appeared in the motions in large curds, so I never give it now unless it has first been peptonized, and indeed I believe it best to give it after a day or two as a change from the meat extracts, and not from the first onset. If the vomiting continues for more than twelve hours, feeding by the rectum should be begun. The enemata should consist of peptonized milk, extracts of beef, white of eggs; about three ounces may be given at a time, and they may be repeated every four hours. If

a stimulant is required, a tablespoonful of whisky may be added to the enema, or it may be given hypodermically. When the vomiting has quite ceased, feeding by the mouth should be resumed. After the patient has become convalescent I make it a rule not to give any solid food for four or five days after the temperature and pulse are normal. Then I begin with toast, and follow in a day or two with a little boiled fish, and gradually allow chicken and the usual diet of health. It is very important to warn the patient to avoid all indigestible food, and take only those articles of diet that are easily assimilated. I make a point of giving each patient a diet chart, and warning him that if he takes anything not mentioned in it he runs a great risk of having a return of his illness. From the chart I carefully exclude raw fruit, nuts, cheese, pastry, pork, veal, shell fish such as lobster and crabs, red fish such as salmon, and other articles of diet that take a long time to digest. The patient must also be warned to take plenty of time to his meals and avoid bolting them, and to take if possible a short rest after them. These instructions, together with others in regard to avoiding too strenuous exercises, have frequently in the writer's experience

The Question of Operation in Appendicitis.

to all appearance been the means of averting a relapse.

There is great diversity of opinion as to the advisability of giving aperients in the treatment of appendicitis. Some writers recommend that they should be given at once, and continued throughout the illness so often as may be required to produce an action of the bowels two or three times a day. They say this treatment encourages peristalsis in the bowel and assists the appendix to get rid of its contents. Now no doubt in ordinary cases of catarrh of the appendix, the organ is full of thick mucus which the stimulus of a purgative to the bowel may help it to eject, but after this is once done the advisability of continuing the purgative is not so clear. The appendix is then in a condition of inflammation, perhaps ulceration, and the caecum and parts around it are much congested; the proper treatment at such a time would seem to be rather to keep all the organs at rest so that the inflammatory condition might subside. The plan of keeping up constantly active peristaltic action in the ileum and caecum does not appear to be in accordance with the usually accepted principle that the first essential of treatment in any inflammatory condition is rest. The writer

Reference:- (A.) Deaver, Op. Cit. p. 239

believes there is also clinical evidence to show the inadvisability of the treatment by continuous purgation. In several of his cases he has had what appeared to be conclusive evidence that this treatment is wrong. As above mentioned he feels confident that in the case of P. B. above described the continuous administration of saline purgatives greatly prolonged the case, irritating instead of giving rest to, the caecum and appendix, thus keeping the temperature up when otherwise it would have fallen so that an operation was performed in the expectation of finding pus. The day after purgatives were stopped the temperature reached nearly the normal level, and there was no further rise. In cases where general peritonitis is present the writer would certainly hesitate to prescribe aperients, but one (A.) Surgeon says it is particularly in these cases that Epsom or Rochelle salts find their special field of usefulness. This is following upon the doctrine associated with the name of Lawson Tait, that peritonitis due to any cause is best treated by Sulphate of magnesia at frequent intervals — a doctrine that is not yet regarded as proved. In cases where there is localised suppuration in appendicitis one would expect that the constant excitation of

The writer's personal views

References :- (A.) "The Early Treatment of Appendicitis", Donald Hood, page 36.

peristaltic action would prevent the consolidation of the adhesions round the abscess, and tend to make the peritonitis become general.

There are on the other hand still many writers who hold that the administration of purgatives at any stage of an attack of appendicitis is to be condemned. Some say that the disease is best treated by keeping the bowels confined until all symptoms have subsided — even ten or fourteen days if required. (4.) Thus Dr Hood of the West London Hospital says he has followed this line of treatment for many years and never seen bad results follow. He prescribes opium immediately he has made the diagnosis, and in this way he believes he has often averted suppuration.

Where experts differ so widely on an important point of treatment it is difficult for a general practitioner to decide. From his own limited experience however the writer has formed very definite opinions on this subject. It appears to him the correct course to pursue when called in to attend a case of appendicitis is be guided in treatment by the symptoms. If they are very severe, — if there is extreme tenderness and rigidity, and the pulse is much over 100 per minute —

Purgatives in Relapsing Appendicitis.

the writer would never give a purgative. He would give opium in some form, the best being the hypodermic injection of morphia — to induce rest in the parts around the appendix, but he would wash out the large intestine with an enema of castor oil followed by soap water as soon as possible. If however the symptoms are mild — the pain, tenderness and rigidity only moderate, and the pulse well under 100 — I believe the best plan is to give an aperient at once. In all cases it is most important to obtain an action of the bowels by purgatives or enemata at the earliest possible moment. The writer has known it frequently give great relief; it has always in his experience diminished the pain, and several times has appeared to markedly shorten the case. But once the bowels have acted, the immediate indication is rest for all parts concerned in the inflammatory action, and no purgative should thereafter be given until the temperature has been normal for a day or two. If the disease continues fairly severe it is the writer's practice to give an enema every alternate day until convalescence is well established.

In cases of relapsing appendicitis where the attack has been mild before and promises to be so again, I never hesitate to give a purgative. Indeed the writer

The "fatal pill."

The Question of fixing Opium.

tells patients likely to have a relapse that if at any time they think an attack impending, they should take a good purge at once. By this means it is certain that many a relapse has been made abortive.

When a purgative is given the most satisfactory is a full dose of castor oil, and this the writer always selects. If there is vomiting, and the oil is rejected the best plan is to try calomel, at least five grains. If this is also vomited, the best plan is to rely upon enemata.

The giving of aperients later in the disease is in the writers opinion very dangerous. There is in the Museum of the College of Surgeons a specimen of a caecum with the appendix hanging from it by a mere thread of tissue. There was a ring of gangrene round its base. It is said that the patient took a pill after he had been ill for a few days, and perforation and general peritonitis were the result. The writer believes there is very good ground for this statement. Had no purgative been given a local abscess would probably have formed and the chances of recovery tenfold increased.

The administration – or otherwise – of opium in appendicitis is also a vexed question. Some writers refuse to give it under any circumstances, while others maintain it to be the sheet-anchor of treatment. No doubt if given frequently

Treatment of Distension.

and in large doses it may be harmful. By giving the patient relief from pain without removing the cause of the pain, it may mask the symptoms, and give the attendant a false notion that all is going on well. It also increases the constipation and may aggravate the distension. Now it is not necessary to give opium to such an extent as to produce these bad results. Where the pain is not extreme it should be avoided, but the writer usually finds that if it is given once or almost twice at the commencement of an attack and the bowels have been relieved by means above suggested, it is no longer required. He has never found any ill effects from giving it. If there is severe pain which cannot be relieved by other means, it ought certainly to be given, but its employment is not often required after the first or second day. If it is given I have found it a good plan to combine it with strychnine; this sometimes greatly relieves the distension if given hypodermically.

If distension is troublesome an enema of turpentine frequently gives relief. If it continues for some days, or if, as frequently happens, it becomes severe after an operation has been performed, the writer finds the rectal flatus tube of much service, and employs it every few hours.

With the treatment above outlined it will be found

The Question of Operation.

Symptoms indicating the necessity for Operation.

that the vast majority of cases will begin to improve by the third day. If we have for our case at its very first onset, it is highly probable that we shall have no suppuration to deal with. If however the case appears to make no progress, and the symptoms are still acute by the third or fourth day, the Question of Operation forces itself upon us. As has been said before, operation should be at once performed whenever we have signs of general peritonitis, or symptoms that lead us with confidence to suspect a localised abscess. For such symptoms we must watch carefully and constantly. It is the writer's practice for the first two or three days to see the patient every six hours at least, in order to detect any of those symptoms at the first possible moment. The indications which lead us to suspect general peritonitis or localised abscess have been described in full when speaking of the usual course of the three types of the disease. Sufficit it here to give a short summary of the symptoms chiefly to be noticed. If the case does not improve by the fifth or sixth day, but the temperature remains high, or becomes hectic in type, with morning remissions and evening elevations; if

Dangers of delaying operation.

the pulse continues frequent, if the local tenderness and rigidity remain great or increase as time goes on; if there is a large swelling still rapidly increasing in size, then there is little doubt we have suppuration to deal with. The diagnosis may sometimes be confirmed by the discovery of fluctuation, or redness or oedema of the skin. Operation should then be done at once. If we delay, we run the risk of the pus spreading in the various directions already enumerated, — to the pelvis, the loin, the region of the kidney or liver — or rupturing into the peritoneal cavity. If the patient is kept perfectly at rest in bed, the danger of this last occurrence is not a great one, but it should not be risked. In the diagnosis of localised suppuration or general peritonitis we must not wait for any particular symptom; no one symptom is pathognomonic of either condition; we must consider the whole train of symptoms and their general intensity.

Again if the vomiting remains persistent, the temperature high, the pulse very quick — 115 to 130 or thereby, the pain and tenderness extreme, or suddenly increasing after a slight abatement, the Hippocratic character of the face noticeable, and the distension continue to

Operation in the writer's cases.

References:- (A.) Treves' Peritypholitis, page 56.

increase, operation is urgently demanded, as we may feel certain that acute peritonitis has commenced, probably following on perforation or gangrene of the appendix.

In cases that have been under treatment from the very onset, operation is rarely required, because, as stated above, the treatment recommended hastens the resolution of the inflammatory processes, and prevents the occurrence of suppuration. Those cases that come to require operation have usually been neglected for the first day or two, or perhaps treated by the ordinary home remedies for colic or indigestion, with unfortunate results. Treves (4.) says that operation in appendicitis is seldom necessary or advisable before the fifth day. This is quite true, but we must not let this fact put us off our guard during the preceding four days. Except for cases that required immediate operation when they first came to his notice, the writer has never had a case in which operation was called for before the fifth day. In the case of J. S. above described, the operation was on the sixth day, in another it was performed on the seventh, in another on the eighth, and in yet another on the twelfth. But if in any case the symptoms of urgency just mentioned were to appear,

the writer would not hesitate to advise immediate operation on the fourth day, or the third, or even earlier. It is unwise to wait for all the signs of pus as it may then be too late for operation to do much good. If the case continues without much improvement for ten days or longer, the writer would certainly advise operation, although the symptoms may not appear urgent, and the signs of pus may not be certain. It is much better to operate too early than too late.

Into the details of the operations necessary in appendicitis it is not the purpose of the writer here to enter. In cases of localised abscess the operation is undertaken in order to liberate the pus. If the surgeon does that and drains the abscess cavity thoroughly he probably effects a permanent cure. It is not advisable for him to make great search for the appendix. If it comes into view it should be removed, but if not it should be left to come away in the discharge later on – as it often does. In one of the writer's cases an abscess was opened on the eighth day. The appendix did not at first appear, but after some searching it was found coiled upon itself and closely adherent to the caecum. The caecum was considerably damaged in detaching it, and

References:-(1.) "British Medical Journal," 19th Sept 1896.

patient died. After the abscess is opened it must be well drained, and care must be taken not to injure the adhesions which separate it from the general peritoneal cavity. Mr Murray (A.) of Liverpool reported a case in which an appendical abscess cavity had been syringed some days after the operation with too much force; rupture into the peritoneum resulted followed by suppurative peritonitis and death. The abscess must be allowed to granulate from the bottom, otherwise secondary abscesses may form and cause a relapse.

In opening the abdomen in cases of general peritonitis the surgeon must remove the gangrenous or perforated appendix, and close up the aperture made in the caecum. The prognosis in such cases depends to some extent on the size of the communication with the caecum. If that is large, much faecal matter passes from the bowel into the peritoneum and death is certain. If however the aperture is small and can be easily closed by sutures, the case is more hopeful.

After a patient has recovered from his first attack of appendicitis he ought to be kept in bed for two or three weeks after the fever is entirely gone. The complete rest gives the appendix a chance to

Treatment of a Relapse.

Operation during the Quiescent Period.

heal up, and the effused products are more easily absorbed. If the swelling continues palpable, massage and kneading are frequently of service in hastening its dispersion. The bowels ought meanwhile to be kept perfectly regular by means of saline aperients, and salol or other disinfectant should be given to prevent decomposition in the intestinal tract. When the patient gets about again, the writer finds it advantageous to apply an abdominal belt, whether an operation has been performed or not.

In cases where a relapse occurs it should be treated first in the same way as the primary attack, as above described. After the acute symptoms have for the second time subsided, the writer usually advises his patients to have the appendix removed. It is best done in the quiescent period ten to fourteen days after the symptoms have subsided. Where the relapse occurs within six months the writer is not so urgent in advising operation, because not uncommonly after a second attack a patient has no more. The second attack in this case is considered by many to be a mere second sequence of the first attack and not a distinct relapse. But after the third attack the writer very strongly urges upon

Dangers of leaving a diseased appendix in the body.

patients the desirability of having the appendix removed. If it be left longer, each relapse probably increases the density of the adhesions by which the organ is bound down, and along with that the difficulty and danger of its removal. When many relapses have occurred it is sometimes found to be impossible to remove the appendix, or it may be so closely adherent to the bowel that no surgeon would venture to remove it, because the risk involved in such a proceeding would be expressed by a mortality of perhaps fifty per cent.

A chronically inflamed appendix is not only liable to give rise to relapses of appendicitis, any one of which may prove fatal, but it may lead to complications which are quite unforeseen. In the case of Mrs Q., above described, we have seen how after three attacks of appendicitis there ensued inflammatory processes in the pelvis, to which she finally succumbed. Had she allowed operation after her third attack, Mrs Q. would in all probability have been alive today. And the writer has known more than one case in which a chronic low state of health was due to a diseased appendix. One of these was the case of a surgeon to one of the London Hospitals. He had had not-

more than two definite attacks of appendicitis, although both had been fairly severe. But his general health was bad; he suffered from constant dyspepsia, with constipation and frequent colicky pains with discomfort in the neighbourhood of the appendix, so that life was to him anything but pleasant. He has recently had his appendix removed, and is now rapidly regaining his former good health.

If the operation is done before too many relapses have occurred it is usually a simple one. In the hands of Treves and other surgeons the mortality attaching to it is only about one per cent, and the writer therefore considers it the duty of every medical practitioner attending such cases to heartily recommend it to his patients.