Appendicitis

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C O U R T E S Y O F C I T I Z E N S A I D S O C I E T Y

1. CASE REPORTS

The diagnosis and treatment of acute appendicitis still presents a serious problem. We are reporting by way of example 3 illustrative cases. This will be followed by a few abstracts from the literature and a survey of our experience with acute appendicitis from January 1932 to January 1935.

1. GANGRENOUS APPENDICITIS WITH PYLEPHLEBITIS AND LIVER ABSCESSES

Case is white male, 36 years of age, admitted to University of Minnesota Hospitals 10-9-34 and expired 10-20-34 (11 days).

Acute Attack

10-1-34 - Pain in abdomen, nausea and vomiting. Temperature rose to 104 and patient experienced a severe chill. No diarrhea. Had an enema daily. Anorexia throughout illness. No history of previous attack.

Admitted

10-9-34 - Physical examination - acutely ill, white male. No jaundice or edema. Diffuse abdominal tenderness and slight rigidity, the rigidity being most marked in the right lower quadrant where a palpable mass is present. Rectal - shows mass on right side. Temperature 104.5. Pulse 130.

Laboratory - Chill

Blood - hemoglobin 94%, leucocytes 18,250. X-ray of abdomen and chest - essentially negative. As patient was returning from x-ray department, he was seized with a severe chill during which he was irrational.

Chills

10-12-34 - Complains of pain in abdomen. Had chill lasting about 2 minutes. Blood transfusion of 700 cc. of citrated blood.

Jaundice

10-16-34 - Icteric index - 35 units.

10-18-34 - Surgical note: Chills, fever and jaundice suggest strongly the diagnosis of pylephlebitis.

10-19-34 - Irrational. Fingers are cyanotic.

10-20-34 - 6:45 A.M. - Expired.

Autopsy

About 1,000 cc. of greenish fluid in the Peritoneal Cavity. The distal part of the cecum is gangrenous and the appendix cannot be definitely made out. The entire mass is adherent to the posterior abdominal wall and is fairly well walled-off.

The right lung weighs 1,300 grams and shows marked congestion posteriorly and scattered areas of consolidation.

The liver weighs 3,450 grams and extends 3 fingers below the costal margin in the right anterior axillary line. It is studded throughout with abscesses, the largest being about 1 cm. in diameter. The portal vein is infected.

The gall-bladder is distended with purulent bile and shows small abscesses in the wall.

Diagnosis

1. Acute gangrenous appendicitis.
2. General peritonitis.
3. Pylephlebitis.
4. Liver abscesses.
5. Bronchopneumonia.
6. Empyema of gall-bladder.

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2. ACUTE APPENDICITIS AND ABSCESS FORMATION

Case is white male, 56 years of age, admitted to University of Minnesota Hospitals 3-24-34 and expired 4-5-34 (10 days).

Acute Attack

3-21-34 - Crampy pain in abdomen with anorexia.

3-22-34 - Severe crampy pain diffuse over entire abdomen. Later in day, localized to lower portion. Anorexia present. No nausea or vomiting. At night, pain became very severe. Given

morphine for relief.

3-23-34 - Pain less intense but present all day, more marked during night.

Admitted

3-24-34 - 3 A.M. Physical examination: Marked rigidity over entire abdomen, rigidity and tenderness most marked in right lower quadrant, rebound tenderness over entire abdomen. Temperature 100.2. Pulse 90.

Laboratory

Blood - leucocytes 5,000, polymorphonuclears 92%. Urine - occasional red blood cells. X-ray shows no free gas in peritoneal cavity. K.U.B. - shows a few shadows which apparently are phleboliths. Diagnosis of acute appendicitis with perforation and peritonitis made. Treatment: Due to presence of generalized peritonitis, conservative therapy is instituted.

Abscess

3-27-34 - Temperature subsides to normal. Rectal examination now shows a large pelvic abscess.

3-30-34 - Definite fluctuation in one portion.

Incised

4-3-34 - Abscess definitely fluctuated. Taken to operating room. Incision through rectum made and about one quart of pus drained.

4-4-34 - Pulse and temperature gradually climbing. Irrational.

4-5-34 - Expired.

Autopsy

Omentum is adherent in pelvis by recently formed adhesions. There is plastic exudate between the coils of the intestine. No distention of bowel. A large peri-appendiceal abscess containing pus and gas under pressure is found. A fecolith is present in the fluid. Appendix is adherent to ileocecal junction. The proximal and midportion of the appendix are gangrenous. There is a large abscess in the pelvis with the upper wall made up of coils of intestine. The abscess cavity is lined by greenish-black, thick, pyogenic membrane. A rubber tube is found in the base. This is traced down to the lower portion of the rectum where an opening through which the tube has been passed is found. There is no connection between the two abscesses and there are no other abscesses in the peritoneal cavity.

Diagnosis:

1. Acute suppurative appendicitis.
2. Appendiceal abscesses around cecum and in pelvis.
3. Operative drainage through rectum
4. Cloudy swelling of heart, liver and kidneys.
5. Acute splenitis.
6. Pleural adhesions.
7. Pulmonary congestion and edema.
8. Slight generalized exudate in peritoneal cavity.

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3. APPENDICITIS WITH GENERALIZED PERITONITIS AND INTESTINAL OBSTRUCTION.

Case is white female, 60 years of age, admitted to University of Minnesota Hospitals 7-4-34 and expired 7-8-34 (4 days).

Pain

7-2-34 - 2:30 P.M., developed crampy, colicky pain in abdomen, accompanied later by abdominal distention, anorexia but not vomiting. No previous attack. Heart trouble for several years.

7-3-34 - Pain not as severe but still present with generalized soreness throughout abdomen. Given enema with some relief of distention. Later in day, had normal bowel movement with considerable relief.

7-4-34 - Pain quite severe, marked distention of abdomen and complaint of generalized soreness of abdomen.

Admitted

7-4-34 - Temperature 100. Pulse 90. Complaining of severe abdominal pain. Heart - enlarged downward and to left. Fibrillating. Blood pressure 130/75. Abdomen - distended and tympanitic; tenderness throughout with rebound tenderness; later more marked on left

side. Rectal - diffuse tenderness but no mass.

Laboratory

Urine - heavy cloud of albumin and numerous red blood cells. Blood - hemoglobin 105%, leucocytes 30,000, polymorphonuclears 94%. X-ray - marked distention of small bowel characteristic of intestinal obstruction; small amount of gas in colon.

Progress

Nasal suction instituted, hot packs applied and digitalis administered.

Impression

Partial intestinal obstruction (mechanical).

7-5-34 - Condition considerably improved. Fibrillation still noted. Abdomen decompressed, no pain, but marked tenderness over entire abdomen, more marked on left. Passed considerable gas by rectum. X-ray at this time showed marked diminution of the obstruction.

Barium

7-6-34 - Suction clamped and later discontinued and oral fluids given without recurrence of symptoms. Barium enema given following which patient complained of soreness and pain throughout abdomen and distention became very marked. Suction instituted with no effect. X-rays showed again marked distention of small bowel. Abdomen very tender, more so on left side. Temperature 101.

7-7-34 - A.M. - Condition unchanged. Still distended. Severe colicky pain in abdomen. No peristaltic activity heard. Temperature 102.

Operation

P.M. - Still markedly distended. Generalized rebound and tenderness.

Examination

Rectal - now reveals a definite mass. It appeares that the patient had a recurrence of her obstruction. Because of presence of a mass and the idea that this was an infarction of the gut, an exploratory operation was done. Preoperative impression: Strangulation obstruction.

Operative findings

General peritonitis, adherent loops of bowel in pelvis. The source of the inflammatory reaction was the appendix.

7-8-34 - Temperature rose steadily postoperatively. Pulse weak and irregular. Fibrillating. Abdomen distended. Temperature 108. Pulse 120. Respirations 40. Patient expired.

No postmortem examination.

II. ABSTRACTS

1. THE RISING MORTALITY FROM APPENDICITIS

L. Sperling

Facts

"The annual loss of life in the United States from appendicitis is about 20,000. This gives the highest ratio per population of any of the civilized nations on earth. The relative frequency of death from appendicitis in this country was 11.4 per 100,000 in 1910, 13.4 in 1920, 15.2 in 1929 and 18.1 in 1930. The average age at death in 1930 was 32.4 years. The victims of appendicitis die at a more productive age than the victims of tuberculosis (36.8 years), of cancer (60.7 years), of nephritis (62.2 years), or of heart disease (64.7 years)."

"The medical profession concedes that the mortality of appendicitis is far too high and that the question presents, as Royster says, a real tragedy because the deaths may be largely prevented if the initial treatment of the disease is correct."

Reasons

(1) The delay of the patient in seek-

ing medical relief, (2) the medical treatment of the attack, (3) the use of purgatives and of morphine, and (4) the mistakes in diagnosis. Other causes which are important and upon which there is little light are the use of the wrong type of operation performed at the wrong time and the wrong treatment of general peritonitis. These factors are great contributing causes of the present mortality and they have not been stressed sufficiently.

"The reported grouped statistics mean little because the mortality rates vary with the number of chronic and acute clean cases included in a given series.

Diagnosis

In appendicitis we find the symptoms and signs occurring in pairs: pain and vomiting, pain being the first to appear; tenderness and rigidity; temperature and leucocytosis. It is the absence, delay of appearance, difference in intensity and wide variation in these symptoms that sometimes make the diagnosis and its differentiation difficult.

Symptoms

"Bowers concludes from his studies of the appendicitis problem in Philadelphia that, (1) only one symptom is always present -- pain; (2) only one sign is uniformly present -- tenderness (absent in 11 per cent); (3) there is only one corroborative test -- leucocyte count (absent in 20 per cent)."

"When pain ceases suddenly it may betoken gangrene, especially when other symptoms continue and only the pain stops. When the pain is very severe and it stops suddenly we fear perforation. It is the lull before the storm - peritonitis. Continuous vomiting that is persistent usually means some complication: perforation, gangrene, peritonitis or obstruction. Rigidity is a valuable sign. It often corresponds to the point of greatest tenderness.

Chill nearly always means gangrene. Very high temperature, especially if it precedes pain, makes one think that it may not be the appendix. Jaundice points to pylephlebitis.

"Perforation is relatively much greater in frequency in children than in elderly people. Young children cannot describe the pain very accurately and perforation is likely to ensue before the condition preceding it is recognized. Tenderness and rigidity are the most dependable signs. They require even more prompt treatment, if possible, than adults. The well-known syndrome of abdominal pain in lower right-sided pleuropneumonia makes diagnosis of great import in children." It is a practice in this hospital to make an x-ray examination of all children's chest before appendicitis operations.

"The cases in which the patients are severely sick from the start, with great and continuous pain, with persistent vomiting, are indicative of obstruction of the lumen of the appendix. This is to all intents and purposes an intestinal obstruction, ending in gangrene and perforation unless promptly operated upon.

2. FACTORS

By L. Sperling

Stanton reviews 10 articles, reporting 16,424 cases of acute appendicitis. There were 894 deaths, a mortality of 5.4%. Twenty years ago, the author reviewed 4,343 cases. There were 279 deaths, a mortality of 6.2%. He points out that the operative mortality of acute appendicitis bears a definite relationship to the duration of the acute inflammatory process prior to the time of operation and, for practical purposes, the duration can be measured in terms of the day of the disease on which the patient is operated upon. He states that the mortality rate as observed from day to day in this disease is inseparably associated with a corresponding sequence of changes in the inflammatory process itself.

Peritoneal Reactions

First Day

"About 30% of the patients operated upon during the first day of the disease present noteworthy peritoneal exudates,

but, be the exudate fibrinous or fluid, and regardless of its extent, the peritoneal surfaces are not yet seriously damaged and, if further contamination from the grossly infected appendix is prevented by removal of the appendix, experience has shown that the peritoneal surfaces are, in vast majority of cases, amply able to take care of any infection present. It is probably worse than useless to attempt drainage in these early cases; first, because it is unnecessary, and, second, because the foreign body acts as a handicap rather than an aid to the natural processes of repair.

"During the second day of the disease approximately 40% of patients operated upon present noteworthy peritoneal lesions. The percentage of cases presenting peritoneal lesions has increased, and the histological characteristics, especially at some distance from the appendix, may vary considerably because not all peritoneal areas are involved at the same time -- but, generally speaking, the peritoneal lesion in the immediate neighborhood of the appendix has reached the stage of capillary engorgement and marked leucocytic infiltration with beginning roughening of the peritoneal surfaces. Notwithstanding the much more formidable pathology encountered in patients operated upon on the second day of the disease, experience has shown that in the great majority of cases the peritoneum is still able to take care of whatever infection there may be after the appendix is removed.

"On the third day, 60 to 80%, of the cases referred to the surgeon present definite evidences of peritoneal involvement, but this high percentage represents in part a selection of cases because by the third day many patients destined to run a mild course have already demonstrated to the satisfaction of the family physician that they will probably recover from their present attack without the necessity of calling a surgeon. By the third day, the operative mortality which began to climb in the cases in which operation was done during the latter half of the second day jumps suddenly to approximately 10% for all cases in which operation is done during the third day. This increased mortality is confined not alone to cases in which the patient presents generalized free fluid in the peritoneal cavity but also to cases which present only local peritonitis and so-called localized abscesses.

After third day

"This latter point should be especially emphasized because the terrific mortality encountered from the third day on in cases in which operation is done for so-called diffuse peritonitis has served to blind surgeons to the fact that in the aggregate a not inconsiderable number of the deaths following operations performed on the third, fourth and fifth days of the attack really occur in cases in which the patients presented rather localized lesions at the time of operation.

"He gives the following tables:

Operated upon	Cases	Deaths	Death Rate %
1st day of attack	1507	20	1.3
2nd day of attack	912	33	3.6
3rd day of attack	663	56	8.9
4th day of attack	356	46	12.9
5th day of attack	442	49	11.6
6th day of attack	346	29	8.4
7th, 8th, and 9th days of attack	178	5	2.8
10th day of attack and later	288	7	2.4

"Four series of cases studied by the writer show the percentage coming to operation during first 48 hours:

1899 to 1905	10%
1907 to 1914	42
1914 to 1923	65
1923 to 1933	80

OUR OWN METHOD

The treatment of appendicitis at the University of Minnesota Hospitals is briefly as follows:

1. Every early case (seen before 48 hours) without extra appendiceal complication is submitted to immediate operation.

2. Cases which are apparently subsiding when first seen are allowed to completely subside before operation.

3. Conservative therapy consisting of rest, hot packs to the abdomen, paraoral fluid, nasal suction and sedatives are carried out in all late cases seen on the third, fourth, fifth or sixth day, and in all cases where extra-appendiceal complications, i.e. abscess or peritonitis, are evident.

4. Transfusion and all other supportive measures are used in those patients with diffuse peritonitis.

5. Appendectomy is done on those patients upon whom conservative therapy has been given for 6 to 8 weeks to allow the inflammatory process to more completely subside so that operation can more safely be carried out.

"The most serious mistake the doctor makes is in thinking the case, although appendicitis, is hardly bad enough to be operated upon. No case, provided that it is appendicitis, is too mild to be operated upon.

"The danger of delay in appendicitis lies in the fact that it changes the nature of the disease. There is hardly another surgical disease in which the difference between its incipient stage and its advanced stage is so great as in appendicitis.

"Theoretically, if every patient could be operated upon within the first 24 hours, the high death rate of appendicitis would be a thing of the past. There sometimes seems to be reason, real or imaginary, why the patient is not operated upon early; then the probabilities are that all chances for a clean early operation have vanished. In all suspicious cases the patient should at least be hospitalized so that a thorough study can be made.

"Everybody is greatly concerned when the signs of extension of the disease have come about and the patient is rushed to the hospital during the fatal third of fourth day. These cases would be better off if not operated upon in that particular period." When the early, safe period for operation has been frittered away, then conservative treatment is at times most judicious.

"The Oschsner treatment..... was designed to avoid immediate interference in delayed cases and to bring about localization or resolution. Oschner's rule number one was to operate upon every case in the beginning of the attack if a suitable hospital and surgeon were available. Because of the notoriously high mortality in the third and fourth-day cases, he taught that such cases were better delayed than to have an operation at a period before nature had been able to do her share in the protection of the patient.

"The surgeon should refrain from removing an appendix not easily found in an old walled-off abscess. To dig out an appendix is not indicated where nature has spent 10 days in walling it off, and in 10 minutes, if the surgeon succeeds in breaking through the wall of the localized abscess, he is likely to scatter the infection broadcast. If, fortunately, an enterolith is in the abscess cavity.... we expect a patient to have no further trouble even though the appendix is left. On the average, about half of the abscess cases where the appendix is left in, never have any recurrence; the other half can be operated upon safely in a few weeks or in the early stages of a recurrent attack should they have it.

"If one starts out on the Oschsner plan of noninterference because a patient has come too late for the early operation and too early for the late operation, then he should not change horses in the middle of the stream and operate upon the patient while the condition is still severe. If it does become localized one can wait with greater safety and perform the operation at a better period." This is particularly indicated when the patient is in bad condition.

Incisions

It has been well proved by experience that long incisions, allowing good exposure and free approach, are much safer

then the small incisions, when a great deal of traction is necessary and when the most delicate part of the operation, that of freeing the diseased appendix, is inadvertently made blind and unsafe. The edematous, gangrenous appendix will easily burst in cumbersome attempts to deliver it blindly through a 'button-hole' incision.

Drainage

"Indiscriminate drainage of the peritoneal cavity is another error that contributes greatly to postoperative obstruction and a higher mortality. It is an accepted fact that draining the peritoneal cavity after an appendectomy, when only a cloudy protective fluid is found at operation, inhibits the defense reaction of the peritoneum. In such cases the patient makes a better recovery when the abdomen is closed tightly.

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III. SURVEY

By L. Sperling

A review of 518 cases of appendicitis seen at the University of Minnesota Hospitals from January 1, 1932 to January 1, 1935:

Types:	Cases	%
1. Interval	85	16
2. Simple acute, uncomplicated	258	50
3. Appendicitis with extra-appendiceal localization (either abscess or local peritonitis)	107	21
4. Appendicitis with general peritonitis	68	13

Total number of acute cases - 433 (84%)

(I) Interval cases: 85 cases, 16% of total.

This includes all cases admitted in the quiescent stage and operated upon in the interval between attacks. Cases of acute appendicitis with complications discharged from the hospital after being treated conservatively and returning later for operation, were included under the classification in which they were first seen, i.e. cases of generalized peritonitis treated conservatively returning later for operation are included in the general peritonitis group, etc.

A. Complications (post-operative)

Wound infection	3
Bronchopneumonia	2
Upper respiratory infection	1
Atelectasis	1

(II) Simple acute uncomplicated cases: 258 cases, 50% of total; 131 females, 127 males. Average age - 21 years.

163 cases with immediate operation - - -	0 deaths
95 cases with delayed operation - - -	1 death

A. Reasons for delay

1. Associated acute upper respiratory infection with mild appendicitis.
2. Subsiding appendicitis.
3. Long history, 3+ days.
4. Co-existing rheumatic fever, diabetes, urinary changes, heart disease.

B. Postoperative complications

Wound infection	7
Atelectasis	5
Pelvic abscess	3
Upper respiratory infection	2

Bronchopneumonia	1
Pleurisy, pyelitis, phlebitis, scarlet fever, pulmonary embolism, intestinal obstruction and tape worm	1 each.

One death from infected hematoma and general peritonitis.

C. Complicating factors

Pregnancy	1
Diabetes	1
Rheumatic fever	1

(III) Acute appendicitis with extra-appendiceal localization (either local peritonitis or abscess): 107 cases, 21% of total; 27 females, 80 males. Average age - 31 years.

33 immediate operations	2 deaths
55 cases with delayed operations	1 death

Of these 55 cases, 11 had drainage of abscesses and returned for appendectomy later, 6 had drainage of abscesses and failed to return for appendectomy, 38 had no operations during first stay in hospital but were treated conservatively and returned 6 weeks later for appendectomy.

19 cases, no operation - 2 deaths;
13 cases failed to return for operation;
In the remainder, operation contraindicated because of age, poor risk, etc.

A. Complications

Wound infection	13
Bronchopneumonia	5
Upper respiratory infection	3
Intestinal obstruction	2
Fecal fistula	2
Postoperative hernia	2
Paralytic ileus	1
Parotitis	1

B. Complicating factors

Urinary infection	2
Osteomyelitis of spine	1
Diabetes	1

(IV) Acute appendicitis with general peritonitis: 68 cases, 13% of total; 24 females, 44 males; 38 cases, 15 years of age or under; 30 cases, over 15 years of age. Average age - 30 years.

8 immediate operations	4 deaths
45 cases with delayed operation	6 deaths

Of these 45 cases, 32 were treated conservatively and returned for operation six to eight weeks later, 8 had incisional drainage of abscesses after sufficient localization and returned for appendectomy later, 5 had incisional drainage of abscesses but failed to return for appendectomy.

15 cases, no operation 13 deaths

Total 68 cases - 23 deaths.

A. Complications

Abscess	20
Pneumonia	5
Atelectasis	3
Wound infection	2
Intestinal obstruction	2
Pyelophlebitis with liver abscesses	1
Pyelitis	1
Postoperative hernia	1

B. Complicating factors

Diabetes	4
Hypertension	2

Days in the hospital

Simple acute appendicitis	9.75
Appendicitis with localization	22.00
Appendicitis with general peritonitis	33.00

Duration of symptoms before admission

Simple acute appendicitis	2.4 days	66% seen before 48 hrs.
Appendicitis with localization	6.1 "	34% " " " "
Appendicitis with general peritonitis	3.5 "	45% " " " "

Only 46% of total seen before 48 hours.

History of recurrent attacks

Simple acute appendicitis	60%
Appendicitis with localization	33%
Appendicitis with general peritonitis	70%

Catharsis

Simple acute appendicitis	6.5%
Appendicitis with localization	29.0%
Appendicitis with general peritonitis	28.0%

SYMPTOMS	Simple Acute %	Acute with Localization %	Acute with General Peritonitis %
Pain	100	100	100
Nausea	83	86	94
Vomiting	55	70	95
Anorexia	64	77	72
Chills	3.8	11	6
Diarrhea	7.7 (not due to cathartics)	20 (15% no cathartic?	25 (20% no cathartic?
FINDINGS			
Tenderness	100	100	100
Rigidity	78	95	100
Rebound tenderness	50	89	95
Abdominal mass	0	41	3
Rectal mass	2	22	9
Rectal tenderness	70	87	94
AVERAGE TEMPERATURE	99.2	101.5	101.6
AVERAGE PULSE	90	104	115
AVERAGE LEUCOCYTES	12,300	19,000	18,000
AVERAGE NEUTROPHILES	71	84	86

Total Acute Cases - 433, 83% of total.

Immediate operation	204	47%
Delayed operation	195	45
No operation	34	8

Total Complications -

Wound infection	22	3.8%
Respiratory complications	25	4.8
Intestinal obstruction	5	1.0

ORTALITY STATISTICS of University of Minnesota Hospital cases from January 1, 1920 to January 15, 1929. (Drs. Tasche and Spano):
All treated by immediate operation.

	Cases	Deaths	Mortality %	
Interval (about 1/2)	339	1	.3	(.3)
Acute suppurative	72	1	1.4	(1)
Acute suppurative c̄ local peritonitis	156	4	2.5	(3)
c̄ abscess	112	11	9.7	(10)
c̄ diffuse peritonitis	21	8	38.0	(38)
Total	700	25	3.4	(3)

ORTALITY STATISTICS of University of Minnesota Hospitals cases from January 1, 1932 to January 1, 1935. (Drs. Sperling and Myrick).

	Cases	Deaths	Mortality %
Interval	85	0	0
Simple acute, uncomplicated	258	1	0.38
Both above groups			0.29
Acute appendicitis c̄ abscess formation	75	3	4.0
Acute appendicitis c̄ local peritonitis	32	2	3.2
Both above groups			3.7
Acute appendicitis c̄ general peritonitis	68	23	33.8
All cases c̄ complications (excluding simple acute)	175	28	16.0
Total	518	29	5.6

It is to be noted that the incidence of general peritonitis 1932 to 1935 is our times that of 1920 to 1929; i.e., 13% as compared to 3% of total cases.

urvey of deaths from appendicitis, January 1932 to January 1935.

There were 37 deaths; 8 cases, however, were omitted from the series for ne following reasons (leaving a total of 29). One was an anesthetic death; one ad severe Addison's disease and developed appendicitis while moribund from that ondition; one was on gynecological service and was not seen by the department of urgery; two had appendectomy elsewhere and were admitted with diffuse peritonitis n a moribund condition; the remaining 3 were moribund on admission, dying within hours.

ex: 16 males, 13 females.

ge: 19 adults, 10 children (15 years or under)

Decades:	1	2	3	4	5	6	7
No. of Cases	5	7	5	2	4	3	3

Average age of adults - 42 years.

Average age of children - 10 years, youngest 2 years.

Average age of entire series - 31 years.

History of recurrent attacks: 35%

Duration of symptoms: before admission to the hospital: 75 hours (average)

56% were seen after 48 hours.

Symptoms:

Pain	100%	
Nausea	96	
Vomiting	86	
Anorexia	90	
Chills	13	
Diarrhea	17	(13% without benefit of cathartics.) (4% with cathartics)

Cathartics: 47% (14 cases). Given by local physician in 3 cases.

Findings:

Tenderness	100%
Rigidity	97
Rebound tenderness	83
Abdominal mass	17
Rectal mass	20
Rectal tenderness	100

Admission temperature: 101.2° (average)

Admission pulse: 112 (average)

Admission leucocytes: 19,100 (average)

Admission polymorphonuclears: 84% (average)

Days in Hospital: 8 days (average)

Eight cases lived 3 days or less after admission.

Classification of cases on admission:

General diffuse peritonitis	20
Appendicitis with localization (6 abscess, 2 local peritonitis)	8
Simple acute appendicitis (allowed to subside before operation and died of complication incident to operation)	1

Treatment:

Immediate operation	7
Delayed operation	7
No operation	15

In the cases operated upon (delayed), there was:

Incision and drainage of pelvic abscess through the rectum	3
Colpotomy	1

Two cases were operated upon because the question of strangulation obstruction arose. Both cases proved to have general peritonitis and died shortly after operation.

The danger of drainage of culdesac abscesses per rectum is illustrated by case report #2. There were 2 such cases which died shortly after this type of drainage.

Autopsies:

Of 29 deaths, there were 23 autopsies and of the 6 not autopsied, 4 were operated upon and so a positive diagnosis is confirmed in 93% of cases.

Complications:

Pulmonary	
Pneumonia	4
Atelectasis	3
Pleural effusion	2
Acute upper respiratory	1
Intestinal obstruction	1
Subphrenic abscess	1
Culdesac abscess	6
Pylephlebitis c liver abscess and empyema of gallbladder	1
Parotitis	1
Impetigo	1
Toxic nephritis (?)	1

Complicating factors:

Diabetes	3
Obesity (300 lbs.)	1

Cause of death:

General peritonitis	24
Multiple abscess formation	3
Local peritonitis	1
Paralytic ileus	1
	29

Cause of death usually a combination of factors with septicemia of general peritonitis a common denominator.

Conclusions

1. The mortality from acute appendicitis is still too high.

2. The probable reasons for this high mortality are:
   (a) Delay
   (b) Catharsis
   (c) Too radical procedure utilized after the infection has spread beyond the appendix.

3. Every case of early appendicitis in which the process is still confined to the walls of the appendix should be operated upon immediately. Cases of appendicitis with extra-appendiceal complications, abscess or diffuse peritonitis are best left alone.

4. Operation after the first 48 hours of the disease should be done only in selected cases.

5. The operative mortality is highest from the third to the sixth day as the operation is done while nature is still trying to localize the process.

6. If an abscess is encountered at operation, too strenuous efforts to remove the appendix should be avoided, especially if it is buried in adhesions.

7. Button-hole incisions should be avoided.

8. Indiscriminate drainage of the peritoneal cavity predisposes to post-operative complications, e.g. obstruction, and should not be done.

9. The use of enemas in cases of intra-abdominal suppuration should not be attempted. (Case report #3).

10. Drainage of culdesac abscesses per rectum carries a definite hazard and mortality as seen in case report #2.

11. A study of 518 consecutive cases of appendicitis of which 433 cases were acute and 175 presented extra-appendiceal complications is presented. A review of 29 deaths from appendicitis during the three-year period (1932-35) is presented.

12. The mortality statistics of the group treated conservatively are sufficiently good to merit a continuation of this type of treatment in the hope that we will learn to use it more intelligently as time goes on.

13. The treatment of diffuse peritonitis is still unsatisfactory and the mortality is still high (33%). Non-specific type of treatment, other than operation, such as sero-therapy, transfusion, etc. may be the answer.

IV. GOSSIP

Red paint on finger nails is the cause of a phobia in a recent office caller. He discharges office help, runs out of restaurants, refuses to accept purchases when confronted with the flaming ornaments. The reaction is nausea and agitation. You name it.....Neurology Fellow Ralph Rossen has trained his dog to travel six miles each way every day to a home in North Minneapolis for food. Like many another dog, his real meat is mailmen's legs. Former mail carriers now on our staff, including Fellow Rossen, remember well the dogs on their routes.. ....The health advertisement by the Metropolitan Life Insurance Company in this week's issue of the Saturday Evening Post on Cancer of the Breast is a masterpiece of psychology in bringing an important message before American women.....Morris Fishbein's daughter Barbara is a junior student in Medical Technology at Minnesota. His convocation subject, Food Fads and Follies, has been murdered by the typesetters,

usually appearing as Food, fads and fol-
lies....Which reminds us of the eccentric
New England millionaire who wrote a book
in which the punctuation was most unusual.
When asked by his publisher about it, he
was temporarily non-plussed, but he solved
the problem by leaving out all the punc-
tuation in the text, reserving several
pages at the end for assorted punctua-
tion marks, with the admonition to "pepper
your own soup".....Speaking of books, we
recommend for your edification or a gift
to a medical or non-medical friend,
"Healthful Living" by our own Dean Harold
Shelly Diehl. Written at the suggestion
of Morris Fishbein, who does the intro-
duction, it is published by McGraw, Hill
and Company and retails at $2.50.
Although not primarily intended as a
textbook, it presents controversial
health and disease problems with such
rare discrimination that it has been
adopted for use in PM&PH3, taught by your
commentator. This course is a further
attempt on the part of Minnesota to try
large classes. (The last enrollment
figure was 378). It was found a few years
ago by an investigating committee that
large classes are actually better than
small ones in certain subjects. A die-
hard said of these findings, "I know you
have the facts but I still do not believe
it." With a parallel course in General
College it is expected that we will reach
1500 non-medical students this year,
which is nearly half of the Freshman
class. The examinations are being com-
piled by the Division of Educational Re-
search, which also makes the "What Do You
Know" for Time, the Weekly News Magazine..
....Allen Agnew, whose death occurred
this summer, will be sadly missed at the
Homecoming Clinics as he was always an
enthusiastic regular attendant.....The
physicians of the institutions under the
State Board of Control have organized a
new society. They had their first meet-
ing at the Epileptic Colony at Cambridge
on Monday of this week to consider
"Autopsies in State Institutions." The
president is a blind physician who is an
enthusiastic user of the "Talking Book"
a circulating library of records with a
device to attach to a radio. He has just
finished a series on historical subjects..
...Not long ago some blind, they prefer
"sightless" individuals, had an argument
in their St. Paul Center over my radio
talk on the Problems of the Deaf - pardon
me, the Hard of Hearing. Was it better
to be blind or deaf? They picked blind-
ness, admitting that it was easier for
the deaf to make a living, but that they
had more fun. "We do not worry about
what you are saying, we can hear you
think," said my good friend.....Which
recalls the reply of Ophthalmologist
Edward Sarsfield Murphy, now of Missoula,
Montana, when told by a trainman that he
was sitting next to the mystic leader of
Mandan, who could read his thoughts. "I
know who he is, and if he could read my
thoughts he would be moving right now."
.....A recent psychological dictum states
"all women have a superiority complex, a
subconscious (or conscious) belief that
they are irresistable, and a desire for
security at any cost. In triangles,
they never shoot their husbands, always
the other woman. Instead of running
away, they faint, like to be caught so
that they can go to court, wear good-
looking clothes and be the center of
attention." When you tell her this get
ready to run, which is said to be what
men do when they shoot their wives
instead of the other man. Adios.

V. HOMECOMING DANCE

- This room after the game on Saturday from 4 to 6, for all medical alumni, staff, nurses, and medical technicians and friends. Tea and cakes. Be sure to come. Everyone else will be here.

VI. COMMUNITY FUND

- Next Week. We'll be seeing you so be ready.

VII. MOVIE TODAY

Title: Spain's Romantic Isle

Released by: RKO-Pathe'

VIII. LAST WEEK

Date: October 17, 1935

Place: Recreation Room,
Nurses' Hall.

Time: 12:15 to 1:15

Program: Movie (Historic Mexico City)
Pylephlebitis
Announcements

Present: 96

Discussion: R. W. Koucky
C. N. Borman
O. H. Wangensteen
H. A. Reimann
Cecil Watson
J. A. Layne