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GENERAL STAFF MEETING
UNIVERSITY HOSPITALS
UNIVERSITY OF MINNESOTA

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I. ANNOUNCEMENTS

1. Tumor Conference: Friday, May 1, 1931, 11 A.M., Todd Amphitheater. Hear Mrs. Edith Wallgren, candidate for Degree of Master of Science in Social Science tell of the results of her personal interviews with more than one hundred women with carcinoma of the uterus. An unusual opportunity to get a mental picture of what went on in the minds of these women when confronted with the early signs of malignancy, how they acted, and why they were late in securing early adequate treatments in such large numbers.

2. May 5 and 6 are the days you have marked on your calendar to keep you from forgetting the Annual Meeting of the Minnesota State Medical Association. It will be a memorable gathering in many ways for it marks the first time in our history that we have been invited to give an all "University of Minnesota" clinic for the members Tuesday afternoon, May 5, 1931, starting at 1 P.M. in Eustis, Todd and Anatomy Amphitheaters and Room 129 Millard Hall. The audiences will be composed of friends, those who send us patients, those who do not and others. It is an unusual opportunity which we trust each contributor will appreciate by doing his level best. This is only one of the many features which will be provided, and all are invited to take part. See and hear the talking movies, visit the scientific exhibit, commercial display and hear the Citizens Aid Society's choice for the Annual Memorial Lecture, Dr. George Gray Ward, Jr., of New York, who will discuss "Carcinoma of the Uterus", and attend the clinic in the Eustis Amphitheater at 1 P.M. on Tuesday, May 5, 1931.

3. A doctor on the School Board would be quite a novelty. Such an opportunity is provided in the coming Minneapolis elections when enough votes for Chas. R. Drake (without the Dr.) will turn the trick.

4. O. S. H. paints a brilliant pen picture of the meeting of the Hennepin County Medical Society, April 6, 1931, when food, nomination of officers and our staff meeting served as bait for a goodly crowd. Nothing is left to the imagination in this descriptive offering which starts with the arresting title of "Jazzing up the Funeral March" and ends with the janitors sweeping out. Issue by issue the facile pen of this versatile person continues to delight the rank and file of the Medicos of Hennepin County.

5. Fame: is ours. We have made "Tonics and Sedatives", J.A.M.A. 96, 26, in the Advertising Department (April 25) 1931. Under the heading "Not Knocking Anybody" the following clipping from the Clara City, Minn. Herald appears: "Mrs. Ben Lay took her son John to the University Hospital in Minneapolis Wednesday where the boy is to have an operation on his head as he has been troubled with deafness. Jacob Bush took them over. Services next Sunday." What! Is this one we missed?

6. Laymen according to Robert B. Greenough, M.D., in the Amer. Jour. of Cancer, XV, 875, April 1931, are to be told that "The directors of the American Society for the Control of Cancer advocate the organization of special cancer institutes and cancer hospitals, where funds sufficient for their maintenance can be obtained from private or public sources. Where separate institutions of this nature are not obtainable, they recommend the organization of special cancer services and cancer clinics in existing general hospitals for the following reasons:

1. The most effective method now available for the early diagnosis and successful treatment of cancer in its many situations consists in entrusting this responsibility to a group of interested members of the hospital staff, including especially representatives of the surgical, medical, and radiotherapy departments, with a pathologist skilled in tumor pathology, and representatives of special departments, such as genito-urinary surgery, gynecology, and nose and throat surgery.

2. Such a service or clinic can be organized in almost every large general hospital at a minimum expense.

3. The group method of study of cancer, as in many other fields, has already contributed materially to the advance of knowledge, and has improved the results of treatment of the disease.

4. Such a service or clinic has also great educational value, not only to the participants on the staff but to house-officers and medical students, nurses and social workers, to the general staff of the hospital, and to the physicians of the community upon whom the hospital depends for its clinical material.

5. It does not seem too much to hope that the further development of such clinics throughout the country and their coordination through the American College of Surgeons may raise the standards of treatment of cancer, and as a practical result begin to reduce the frightful mortality from this disease.

II. CASE REPORT

PUERPERAL SEPSIS, GANGRENOUS COLITIS (GAS BACILLUS INFECTION). Path. Henrikson.

The case is that of an adult white female, 25 years of age, admitted to the University Hospitals 3-24-31 and died 4-4-31. (11 days).

Pregnancy:

7-5-30 Last menstrual period.

10-7-30 Tingling of breasts.

11-25-30 Some pain in lower abdomen. Physician consulted. Pregnancy diagnosed. Felt life.

1-1-31 Headaches.

Prenatal (2nd trimester)

1-7-31 Entered University Dispensary. Physical Examination: Well nourished and developed white girl of low mentality, very sluggish in speech, and answers questions poorly. Head - pus in inner canthus of right eye. Tongue - coated. Tonsils - enlarged. Teeth - poor. Acne over cheeks. Neck - enlarged submaxillary nodes. Chest - Lungs and Heart - negative. B.P. 108/60. Breasts - areola and glands of Montgomery enlarged. Whitish stria in skin. Colostrum expressible. Abdomen - ovoid. Linea nigra present. Fundus three fingers above the umbilicus. O.L.A. Fetal heart tones in R.L.Q. Referred to obstetrics - gravida i, para O. Due April 15. Head in fundus. Breech in pelvis. Back to left. Pelvic measurement 25.5, 29, 32, and 19.5. Outlet 8 cm. Diagonal conjugate 13.5. Urine negative. Wassermann negative. Hb 60; rbc 3,150,000; wbc 7,400; P 72; L 20; M 7; E 1.

1-14-31 (Dispensary) Cervical smears negative; moderate amount of pus. No gonoccocci. Temperature 99.4; pulse 96; respiration 22. Urine negative. B.P. 115/78.

2-14-31 (Dispensary) T.97; P 96; R 22. Urine negative. No complaints.

2-28-31 (Dispensary) T. 99.8; P. 84; R. 20; Urine negative. B.P. 110/72.

Labor threatened

3-11-31 (Dispensary) T. 100; P. 90; R. 20. Having pains in lower abdomen every 15 to 30 minutes since yesterday. Examination - O.L.A. Head almost to spines. Cervix posterior. Note: dilated, not effaced. Diagnosis - threatened premature labor. Possible complicating pyelitis? Refer to Hospital. 3:00 P.M. Entered University Hospitals. Breasts engorged. Fundus four fingers below the xyphoid process, size of eight months pregnancy. O.L.A. Fetal heart 148 in L.L.Q. Pains every 15 minutes. 5:00 P.M. Sleeping soundly after morphine sulphate gr.1/4 (H) and chloral hydrate gr xlv, and magnesium sulphate 2 cc. 50% intramuscularly.

3-12-31 - Comfortable. T. 98.4; P.88

Diarrhoea

3-13-31 Severe diarrhea. No pain. Seems dazed. Depressed. Responds slowly. No complaints, except for numerous loose stools. Pain in base of right chest in A.M. T. 98.6; P 85.

3-14-31 Comfortable. T. 99.2; P 88. Discharged.

Cough

3-17-31 (Dispensary) T 100; P 94; R 20. Urine negative. Some cough since leaving Hospital. Advised to drink lots of fluids. Given Elix. terp. hyd. B.P. 124/88.

3-21-31 (Dispensary) T 99; P 84; R 20.

Urine negative.
3-23-31 B.P. 120/85. O.L.A. Return in one week.

Labor
3-24-31 2:00 A.M. Pains began. 3:10 A.M. membranes ruptured. 5:50 A.M. Readmitted to University Hospitals. Pains every two minutes. Head over inlet, not fixed. O.L.A. Fetal heart tones 128 over L.L.Q. 9:00 A.M. catheterized 100 cc. 11:30 A.M. Morphine sulphate gr. 1/4 plus 2 cc. 50% magnesium sulphage (H). Chloral hydrate gr. xlv per rectum because of fatigue. Cervix dilated about two fingers, head at spine. Pains irregular and inefficient during afternoon. 3:30 P.M. 225 cc urine per catheter. Oz. ss 1% mercurochrome instilled. 9:00 P.M. repeated same drugs. 11:00 P.M. 200 cc. urine per catheter.

Pains
3-25-31 Pains continued through the night. 6:00 P.M. 200 cc urine per catheter. 9:00 A.M. head on floor in sight. Fetal heart O.K. Patient in fair condition. 10:10 A.M. 100 cc urine per catheter. 2:40 P.M. 125 cc urine per catheter. Oz. i of 1% mercurochrome instilled. 4:00 P.M. getting very tired, no progress. Head remains in sight, bulging perineum. 6:45 P.M. Quinine sulph. gr. xv (M). 7:00 P.M. Head on floor. Sagital suture in right oblique and head seems flexed laterally. Fetal heart tones now 160-170. 8:15 P.M. Put on delivery table in stirrups. Vaginal examination shows O.L.A.

Forceps
Forceps applied and intermittent traction continued for one hour. Fetal heart tones 80. Mother's pulse dropping from 148-110. 10:45 P.M. Second vaginal examination - sacrum deformed. Craniotomy considered. Axis traction forceps applied. Medio-lateral episiotomy performed.

Stillbirth
Stillborn delivered. 10:47 Placenta expressed. Mother's B.P. 126/90. 10:48 Pituitrin and ergot 1cc (H). Episiotomy repaired. Approximate loss of blood 300 cc. 11:36 P.M. 1000 cc 10% glucose intravenously. 12:45 P.M. morphine sulphate gr. 1/4 (H). Light to perineum.

Diarrhoea
3-26-31 Mag. sulphate oz. ss b.i.d. Three liquid stools during A.M. Pulse weak. Some edema of perineum. Magnesium sulphate discontinued. Bismuth subnitrate gr. xx t.i.d. Aspirin gr. x and codeine gr. ss (M). Tincture of paregoric drams i. Catheterized every eight hours. Fundus at umbilicus. Diarrhea lmost continuous. Urine shows 1 plus sugar and 2 plus albumin. Appears stuporous.

Uncooperative
3-27-31 TN paregoric drams i t.i.d. Ice bag to breasts. Uncooperative. Will not keep light to perineum. Complains of pain in breasts. Hemorrhagic areas on breasts where patient pinches herself. Amytal for restlessness. Catheterized urine specimen contains many rbc's.

Confusion
3-28-31 Seems stuporous. Still being catheterized every eight hours and having mercurochrome instillations and normal saline irrigations. Had involuntary once today. Puts hands to perineum. Hands in restraints. 2000 cc normal saline by hypodermoclysis. Hb 60; B.U.N. 60.2. Blood sugar .086. T 100; P 100. Neurological consultation exhaustion -- confusion episode in a feeble-minded individual. Suggestion-- tube feed, have stool examination, blood culture and blood chemistry.

Restraint
3-29-31 Involuntary urinations. Diarrhea almost over. Legs restrained. Pulse fair and regular. Groans but does not complain. Morphine sulphate gr.1/4 and atropine gr. 1/150 (H) for general aches and pains. Paregoric and bismuth discontinued. Begs to be let out of restraints. 3000 cc normal saline by hypodermoclysis. Triple bromides gr. xv t.i.d. 11:00 P.M. singing at top of voice. T 102; P 120.
3-30-31 12:30 A.M. Large foul-smelling greenish emesis. Pain in bladder region. Noisy and restless. Abdomen markedly distended and tender. Episiotomy gaping. 2:45 A.M. Codeine sulphate gr. i (H) Emesis 500 cc foul-smelling fluid. 10:00 A.M. Noble's enema. Poor results. T 102.2 Noisy and uncooperative. Pituitrin 1/2 cc (H). Turpentine stupes begun. Eyes

sunken and dull. 3000 cc. normal saline by hypodermoclysis. Put on sodium bicarbonate gr. xx q.i.d. to alkalize urine.

Pyuria
Urine examination: Packed with wbc's and rbc's; albumen: ++ B.U.N. 24.2; Cabon dioxide 51; T 102.2; P 120. Pyelitis, cystitis, and peritonitis considered.

Obstruction
X-ray of abdomen: Marked distension of stomach and small intestines with characteristic layering suggesting obstruction. Absence of a distension of colon is against paralytic ileus. Separation of loops suggests fluid in peritoneal cavity.
3-31-31 12:00 A.M. gastric lavage. 400 cc retention. 1:15 A.M. Noble's enema with poor results. Rectal tube inserted. 7:10 A.M. Emesis of 1000 cc dark green fluid. Involuntary diarrhea. Emesis of 400 cc greenish fluid. 9:00 A.M. seems brighter and more cooperative. Bladder irrigated with boric solution. Refused noon feeding. Tries to get out of bed. 2:00 P.M. 1000 cc of 10% glucose given intravenously. 2:55 P.M. 75 cc of 12-1/2% physiological saline added to intravenous solution. 2000 cc normal saline by hypodermoclysis. 5:45 P.M. Milk and molasses enema and pituitrin 1/2 cc. (H). Fair results. Patient very uncooperative, 6:15 P.M. 1/2 cc pituitrin (H) 8:30 P.M. Gastric lavage -- 1000 cc retention. Oz. i magnesium sulphate by gavage. 9:40 P.M. 1000 cc. of 10% glucose in normal saline plus 75 cc hypertonic salt solution. Pulse rapid and weak. Worked out of restraints and sat on edge of bed. Episiotomy wound appears necrotic. T 103.4; P 140.

Worse
4-1-31 Respirations rapid and shallow. Patient takes out rectal tube if put in. Esserin gr. 1/50 twice with no results. 6:10 A.M. 1000 cc urine by catheter. Abdomen much distended. 9:20 A.M. Noble's enema 9:25 A.M. Surgical pituitrin 1/2 cc (H) and repeat in 1/2 hr. Episiotomy wound broken down. 10:00 and 10:20 A.M. brownish, foul-smelling emesis. 11:00 A.M. gastric lavage 1000 cc dark brown retention. 1:00 P.M. More rational, more comfortable. Less diarrhoea. 3:40 P.M. Blood transfusion. 4:45 P.M. 2000 cc. normal saline by hypodermoclysis. 9:00 P.M. Milk and molasses enema and two pituitrin hypos of 1/2 cc ea each 30 minutes apart. Poor results. Turpentine stupes still being continued. 11:45 P.M. Patient restless and noisy. Severe diarrhea. Slight emesis. T 102; P 110; Hb 51; Wbc's 20,750; Rbc's 2,840,000. L 18; M 1; P 81.

Violent
4-2-31 Condition about the same. Sings loudly and tries to get out of restraints. 4:50 A.M. Gastric lavage - 1350 cc retention. 6:45 A.M. Up in corridor. Will not stay in bed. Hot saline irrigations and dichloramine - T to perineum. 1000 cc 10% glucose intragenously. Blebs and broken down areas over buttock. 2:00 P.M. gastric lavage - 200 cc dark brown fluid retention. Patient violent. Swears, kicks and yells. 2:40 P.M. Sodium luminol gr. ii (H) 4:15 P.M. morphine sulphate gr. 1/4 (H) 1500 cc normal saline by hypodermoclysis. Continuous dark gray discharge from rectum. Wound looks better. Chloral hydrate gr. xxx for restlessness. T climbing - 101 - 104; P 96 - 130.

Gangrene (gas)
4-3-31 Tears at bed clothes. Very noisy. Much weaker. Milk and molasses enema expelled while being given. Pituitrin 1/2 cc (H) twice without much effect. 350 cc 10% glucose intravenously. 10:00 A.M. 500 cc gastric retention on lavage. 11:00 A.M. Surgical consultation- gangrenous inflammation of vagina and perineal tissues. Rectum intact. Question of bladder being intact can be determined by methylène blue instillation into bladder. Some gas in tissues. If gangrene extends to uterus, condition is hopeless. Should have antitoxin and debridement. 1:30 P.M. Methylene blue instillation into bladder failed to reveal fistula. Hands and legs cold. Condition poor. Cyanotic. T 105.4 rectally; pulse 160. 2:10 P.M. Caffeine sodium benzoate gr. viiss (H) Patient immediately became noisy and restless. 3:00 P.M. Listless. Breathing labored. Does not respond well. 7:30 P.M. 10 cc polyvalent anaerobic gas-bacillus antitoxin in 100 cc saline solution intravenously. Patient unresponsive. 7:45 P.M. Caffeine sodium benzoate gr. viixx

helpful. 8:10 P.M. Adrenalin 3/4 cc for cyanosis without effect. 2000 cc normal saline by hypodermoclysis. 9:00 P.M. 1000 cc sodium bicarbonate solution as gastric lavage. 10:00 A.M. Blood-tinged drainage from rectum.

4-4-31 Stuporous. Does not respond. 2:15 A.M. Caffeine sodium benzoate gr. viiss (H) Respiration gasping. Pulse imperceptible. 3:40 A.M. Respiration intermittent, P 160; T 107, rectally. 4:15 A.M. Exitus.

Autopsy

The body is that of a well developed, well nourished, white female, 163 cm. in length and weighing 120#. Rigor is present; hypostasis is purplish and posterior; no edema; slight cyanosis. The right pupil is 5 mm. and the left is 8 mm. There are purpuric areas over the surface of the arealae and nipples, and an irregular triangular area below the left areola extending downward 6 cm. There are erosions over the right pubia (3x3 cm.) and about the right elbow. The skin is eroded from over the buttocks, sacrum, and there are small 1-2 cm. eroded patches over the back. There are puncture wounds in the antecubital spaces, axilla and outer surfaces of both arms. There is a small incision 1/2 cm. long containing three sutures in the right antecubital space. The vulvae are swollen. The perineum is purplish-black and replaced by gangrenous sloughing tissue.

Upon opening the Peritoneal cavity the intestines are markedly distended. There is no free fluid visible. The appendix hangs free and is only 2 cm. long. The right diaphragm is at the 4th intercostal space and the left at the 4th rib.

The Pleural cavities are normal. The pericardial sac is normal.

The heart weighs 275 gm. The foramen ovale is closed. The vulves are normal. The coronary arteries show no sclerosis. The root of the aorta is normal.

The left lung weighs 250 gm. and the right weighs 350 gm. They are light pink except posteriorly where they are bluish-red showing slight congestion. On surfaces made by cutting, the posterior portions are deep purple-red and the anterior portions are light pink. No pus is expressible.

The spleen weighs 125 gm. and appears normal. The surfaces made by cutting are purplish-red.

The liver weighs 1750 gm. and on cross section is light brown-red. The margins evert slightly.

The gall bladder is normal.

The gastro-intestinal tract is dilated throughout. It contains some watery fluid. The rectum, sigmoid colon, descending colon, splenic flexure and 5 cm. of the transverse colon are bluish-black and firm. Some of the coils of the small intestine are adherent to portions of the wall by a fibrino-purulent exudate. On opening this portion of the bowel, the wall is found to be green-blue due to an infiltration of a wall. The mucosa is replaced by a necrotic appearing membrane which peals away very easily, exposing the submucosa. There are no signs of a fistula between the uterus and bowel.

The pancreas weighs 100 gm. and appears normal.

The adrenals are normal.

The left kidney weighs 200 gm. and the right weighs 200 gm. The capsule strips easily. Surfaces made by cutting bulge slightly and are gray-red. Both ureters are slightly dilated. The uterus is the size of a large male fist and is very soft. The endometrium is covered by a dark flabby, friable material which strips fairly easily from the surface. The cervix is bluish-black up to the internal os. The vaginal mucosa is also bluish-black, but the surfaces are fairly smooth and glistening. The ovaries are normal.

The bladder is removed and opened. No vesico-vaginal fistula is present. The vesicle mucosa is replaced by a brownish-nectoric-appearing membrane which strips away from the wall fairly easily exposing a hemorrhagic surface. The urethra is likewise covered by a brownish membrane. The gangrenous portions ofthe perineum are continuous with the bluish-black areas of the vagina and rectum.

The retroperitoneal lymph nodes are light brown, firm and vary in size from split-pea to lima bean.

The organs of the head and neck were not examined.

Diagnosis:

1. Post-partum (9th day).
2. Suppurative gangrene of perineum

rectum, sigmoid, descending colon and a portion of the transverse colon.
3. Bowel obstruction.
4. Hemorrhagic membranous cystitis and cervicitis.
5. Gangrenous vaginitis and cervicitis.
6. Subinvolution of uterus with endometritis.
7. Dilatation of right ureter (lower one-third) due to pregnancy.
8. Cloudy swelling of the kidneys and liver.
9. Hemorrhages of skin.
10. Slight icterus (brown skin).

III. ABSTRACT

Ref. Clostridium welchii septicemia complicating prolonged labor due to obstructing myoma of uterus, with report of case. Toombs, P. W. and Michelson, I. D., Amer. Jour. of Obs. and Gyn. XV, 379-389 (Mar.) 1928. Abstr. O'Brien.

1. Material: Report of case, review of literature (45 cases).

2. Historical: first report by Leduc (1857), first antemorgem diagnosis, Dobbin (1897), review of literature, Little (1905) 12 cases either due to gas bacillus alone or associated with other organisms. One was typhoid fever. Whiteacre (1907), reported case with abdominal complication simulating appendicitis (free bloody peritoneal fluid was found). Young and Rhea (1909) noted deep brown to bronze color of skin positive blood culture (jaundice) Binghold (1914) reported 130 cases of puerperal infection associated with C. welchii. Types: (a) localized endometritic type, well walled off, symptomless course, practically always ends in recovery, organisms may enter blood (mechanical). (b) lymphangitic type; infection in uterine musculature extending to peritoneum and blood stream, serious symptoms, may end fatally. (c) thrombophlebitic type spreads thru veins, frequent chills, streptococci frequently found in association. C. welchii secondary? Author's case was colored woman age 32 with prolonged labor (3 days). Attempted version, death of fetus, difficult delivery with cranioclast, manual removal of placenta next day. Third day condition serious, blood and uterine cultures showed C. welchii. Hysterectomy followed by death (generalized gas found). Authors select 41 cases from literature for detailed analysis.

3. Nature of pregnancy: (a) abortion (60.97%). (b) Non-abortion (39.03%) Non-abortion group subdivided: contracted pelvis, protracted labor, transverse presentation, normal (7.29% each) obstructive myoma, fetal death, breech, unclassified (2.43% each).

4. Method of delivery: Non-abortion group, first stage prolonged in all except one. Conditions present favored frequent vaginal examinations, and various operative procedures. C. welchii not normally present? May be introduced in this way. Abortions also favor infection (injury, necrosis).

5. Sepsis*: prodrome - within 24 hrs. (50%); in 48 hrs. (70%); over one-third die in 48 hours; over one-half in 4 days, indicating fulminating character. Recovery in 13.16% (most with hysterectomy). Death may take place as late as 19 days. Authors suggest hysterectomy? and serum as probable ideal treatment (with blood transfusion).

6. Symptoms: abdominal pain (55.6%) vomiting (47.37%), chills (34.21%) diarrhoea (21.06%), convulsions (5.26%). Pain especially in abortive group is earliest and most frequently observed symptom. Vomiting usually occurs early and then disappears but may persist, diarrhoea may be early or late. Two cases suggested air embolism.

7. Chief signs are jaundice (50%) - early in (16.6%). (60%) in 48 hours of those presenting it, mild to dark brown or beonze, cyanosis (42.12%), skin shows emphysema (16.59% only) (4.74%) generalized, usually localized and terminal(see our case). Other colors of skin: grayish blue (5.26%) grayish-green (2.64%) pale gray (2.62%), red lines over triceps (2.63%), puffiness of face (5.26%) Change in uterus: (16.59%) (tympain uteri (10.52%) physometra uteri (2.63%).

(Note difference from same disease in extremeties). Minimal local signs of infection - gas.

8. Urine: albumin (19.04%) sugar (4.7%), hematophophyrin (4.76%), methemoglobin (28.56%), oxyhemoglobin (28.56%), hematin (9.52%) pus cells and red cells (costs) (38.08%). Usually scanty urine obtained by catheterization. Changes due to hemotoxin of C. welchii, also jaundice from same cause.

9. Blood: white count from 10,000 to 125,000, usually from 10 to 20,000 (one-third); red count 1,500,000 to 4,000,000 in 75%, normal in 25%. 50% between 1,500,000 and 2,000,000. Hemoglobin 20-60%. Nearly one half 20-30%. Secondary anemia develops very rapidly. Bone marrow cells may be present.

10. Temperature: elevated in 80%. No definite type.

11. Bacteriology: 16 positive blood cultures obtained; 19 in uterus during life. May be associated with other organisms in blood (typhoid, streptococcus, staphylococcus, pneumococcus, b. coli). Found in 9% uterine growths in pure culture. Others showed staphylococcus, streptococcus and b. coli.

12. Pathogenesis: Organisms occur normally in animal and human feces, soil and dirt and anything which may be contaminated by either. When introduced into uterus may produce local or general infection. Jaundice due to rich absorptive area. Part organism plays must be decided in each case. In one report C. welchii died out and death was due to other organisms.

13. Conclusions:

1. Abortion is most important factor in C. welchii infection.

2. Abdominal pain, fever, rapid pulse, jaundice, cyanosis, air hunger, hemoglobinuria, hemoglobinemia, rapidly progressive anemia, suggest C. welchii sepsis.

3. Hysterectomy?; antitoxin and blood transfusion seem to be logical method of treatment.

Comment:

What is the cause of infection in our case? Subnormal patient with prenatal care since second trimester develops diarrhoea, slight fever before labor, did not feel well, cough, pain in chest and false labor. Labor (slightly premature) is difficult but not unusually prolonged (24 hours). Vaginal examination is made. Difficult forceps delivery and episiotomy is done, (still born fetus). Diarrhoea continues. Catheterization necessary after delivery. Very restless, stuporous (suggestion of confusional state). Diarrhoea improves. Temperature 102 (4th day). First rise about 100. Emesis (5th day) also pus and red cells in urine, signs of peritoneal involvement (intestinal obstruction). Necrosis of episiotomy wound with increasing gangrene and terminal local gas. Is the bowel infection the cause? C. welchii diarrhoea has been described (J.P. Simons, Monograph #5 Rockefeller Institute 1915). Is the involvement of the bowel primary or secondary? Probably secondary although primary gangrenous ulcerative colitis is seen. Note: diarrhoea present in 21.06% of reported cases; absence of report of pain in abdomen, chills, convulsions, marked jaundice, local changes in uterus. Question of hysterectomy as form of treatment in entire group is debatable. Blood transfusion (our case) and antitoxin seem indicated.

IV. CASE REPORT

ACUTE SUPPURATIVE APPENDICITIS (GANGRENE AND PERFORATION), ACUTE GENERALIZED PERITONITIS.
Path. Randall.

The case is that of a school-boy, 9 years of age, admitted to the University Hospitals 3:30 P.M., 4-1-31 and died 8:30 P.M. 4-1-31 (5 hrs.)

Pain vomiting

3-27-31 The patient was well up to this day when he developed a slight pain across lower abdomen which was followed by vomiting. The patient was not very sick this day and did not go to bed.

3-28-31 He did not get up as early as usual but was not very sick. He did not play as vigorously as usual.

Very sick
3-29-31 The child was quite ill and vomited the fluid which he drank. Anorexia, nausea. He remained in bed all day. Was given castor oil that night which was followed by severe pain and distress in the lower abdomen.

Better
3-30-31 He felt better. The pain was let up three or four hours at a time.

Worse
3-31-31 Was very sick. Vomited four or five times and the pain was worse than at any other time during his illness.

Sixth day
4-1-31 A physician was called and he told the parents that the child had a very severe attack of appendicitis and advised him to come to the University Hospitals because he did not care to take the case.

Hospital
Physical examination: Eyes, nose and throat negative. Chest--there seems to be a limited motion on respiration and child complains of pain on deep breathing. The diaphragm seems high on right side otherwise chest is negative. Heart--pulse is very rapid, rate 120. Blood pressure 90/60. Abdomen--very rigid all over. There is marked tenderness over entire abdomen. Pain more localized in the right lower quadrant. Rectal examination--revealed a marked induration throughout the pelvis, and fullness in culdesac. Impression: Acute generalized peritonitis. (2) Acute suppurative appendicitis (ruptured).

Pre-operative
Admission Note by Fellow.
4-1-31 Abdominal pain, nausea, vomiting, anorexia six day duration with increased symptoms in past three days and severe for past twelve hours. This is the patient's first attack. Examination shows generalized abdominal rigidity and tenderness with maximum at McBurney's point. Induration? throughout pelvis on rectal examination. Diag.: Acute suppurative appendicitis with spreading peritonitis. In view of long duration and extension in past twelve hours immediate operation is indicated. There is no evidence now of tendency to localize.

Laboratory
Urine analysis--specific gravity 1.025; sugar and albumen negative; many granular and hyaline casts; occasional rbc's and wbc's. Blood examination: Hbg 80%; wbc's 22,800; pmn's 43; L 54; and M 3.

Progress
3:30 P.M. Patient was admitted. Temperature 103.4; pulse 95; respiration 22. Admission bath. 5:00 P.M. emesis of dark brown fluid 400 cc. Complains of pain and soreness in abdomen. 5:10 P.M. intravenous 800 cc of 5% glucose started. 6:30 P.M. morphine sulphate gr. 1/10.

Operation
7:00 P.M. to operating room. 2-1/2 cc spinocaine used. Anesthesia at beginning of operation above umbilicus. He complained of great deal of pain and distress in the latter part of operation. Given oxygen for relief. Blood pressure at the end of the operation was 70. (sys) Patient returned to his room and put to bed.

Respiratory failure
He suddenly became cyanotic and stopped breathing. Artificial respiration was given. 3 cc. of metrazol given and 2 cc intra-cardiac followed. 1 ampule caffeine benzoate given. The patien did not respond. Heart inaudible, respirations did not return. At operation a right McBurney's incision was made. A large amount of pus was obtained. The appendix was perforated and presented in the incision. It was removed. Three rubber tissue drains were left in the abdomen and this incision was closed in layers. 8:30 P.M. Pronounced dead.

Autopsy
Length, 145 cm. Weight, 100#. The body is that of a well developed, well nourished boy, appearing somewhat cyanotic. He is somewhat pale. Rigor is not present; hypostasis is purplish and posterior; there is no edema. There is a right lower McBurney's incision measuring 10 cm. in length closed with interrupted sutures; there are three rubber tissue drains covered by surgical bandages.
Peritoneal cavity. There is extreme visceral and parietal peritonitis. All

of the surfaces are red, granular with a great deal of fibrinous exudate in the pelvis. In right lower quadrant omentum is adherent to pelvic sigmoid. The stump of the appendix is free and is not inverted. There are three rubber tissue drains extending in this region (region of the appendix). There is about 1500 cc. of purulent exudate, foul, and somewhat watery in appearance. This exudate extends up the left gutter. The sigmoid colon is deeply hemorrhagic and covered with fibrinous exudate. There are numerous loops of intestines in right lower quadrant which are matted together by thin fibrinous adhesions. There is a fibrinous exudate extending up over lower margin of liver, gall bladder and spleen. The gall bladder is somewhat thickened and its surface is granular.

Pleural cavities. The surfaces are smooth and glistening. The organs show normal relationship to one another. There is about 75 cc. of clear, thin exudate in the right pleural cavity. The pericardial sac, the surfaces are smooth, moist and glistening. No increase in fluid.

The heart weighs 175 Gm. The whole musculature appears somewhat flabby and are a reddish-gray. The endocardium is smooth. The valves appear normal. The root of the aorta shows nothing abnormal.

The right lung weighs 175 Gm. and the left weighs 150 Gm. The surfaces are smooth, moist and glistening. The lungs are somewhat emphysematous but not greatly. Both lungs are air-containing. There is no evidence of consolidation. There is very little congestion.

The spleen weighs 100 Gm. It is dark and strips easily. The malpighian corpuscles are indistinct. The pulp is quite soft and scrapes.

The liver weighs 1100 Gm. and is of grayish-brown color and the lobulations are distinct. There is a slight cloudy swelling.

The surface of the gall bladder is granular and the wall is thickened. It contains green bile.

The Gastro-intestinal tract is the same as described in the peritoneal cavity. Generalized peritonitis. There is an acute fibrinous exudate principally in the right lower quadrant and in the pelvis. There is a large amount of purulent fluid in the pelvis extending up along both gutters.

The Pancreas weighs 100 Gm.

The Adrenals weigh about 10 Gm. each. On section the cortex and medulla are distinct.

The kidneys weigh 175# each. The capsule strips easily. The glomeruli are pale. The cortex and medulla are distinct.

The bladder, aorta, and genital organs are negative.

The retro-peritoneal lymph nodes are distinctly hyperplastic throughout.

Diagnosis

1. Acute generalised peritonitis.
2. Thick fibrinous exudate over right lower quadrant and pelvis.
3. Post-operative (acute ruptured appendicitis).
4. Cloudy swelling of liver and kidneys, and splenitis.
5. Slight emphysema of the lungs.
6. Right lower McBurney's incision.
7. Cyanosis and pallor.
8. Retroperitoneal lymphadenitis (hyperplastic).

Comment:

Appendectomy done 6th day of illness (antemortem). Special features of illness - (1) insidious onset with progressive prostration first two days. (2) rapid progression on third day when he was given castor oil; (3) better on fourth (up and around part of time); (4) very sick on fifth day; (5) physician called on sixth day for first time; (6) admitted to hospital with generalized peritonitis. Did perforation occur on the third day? Note: small amount of exudate in right pleural cavity and recently formed thin adhesions in several foci thruout peritoneal cavity (including appendical retion). Prognostic factors of grave import - young, male, cathartic? late operation, and low neutrophile percentage.

V. ABSTRACTS

Analysis of Seven Hundred consecutive appendectomies - Tasche, L.W., and Spano, J. P., Ann. of Surg. xciii, 899-910, (Apr.) 1931. (University of Minnesota Hospital Series). Following conclusions may be drawn from this study presented in abstract before previous staff meeting. Abstr. Randall.

1. Material consists of 700 consecutive cases of appendicitis operated upon at University Hospitals, Jan. 1, 1920 to Jan. 15, 1929.

2. Appendicitis death rate has increased from 11 (1920) to 14.4 per 100,000 (1925). 20,000 persons die of disease annually.

3. Operative mortality has apparently decreased according to the literature of 75,858 in literature divided into three periods: 1902-1910 - 7.6%; 1910-1920 - 5.7%; 1920-1929 - 3.5%. (What is the answer?)

4. Sex in all cases (acute and interval) is males 50.5%; females 49.5%.

5. In acute cases males predominate (60.9%); in interval females (61.4%).

6. Exactly 75% occurred in second and third decades - average age (21.9 yrs) lower than other reports?

7. Highest incidence in summer season. (Authors do not state whether this always refers to first attack or if larger number of interval cases came in summer).

8. Only 5.8% had other infections; i. e., sore throat (Note more prevalent in children.)

9. Previous attacks reported by 57.1%. No record in 35%; negative history in 8.8%. Other figures (25, 28.4, 30, 35, 37%).

10. Types: mild, moderate or severe, very severe.

11. Pathological types: inactive, acute recurrent (should be changed to peritonitis?) acute suppurative, obliterative).

12. 339 (one-half) were interval cases due to type of patient. One death, (0.3%) in group due to ileus in difficult appendectomy.

13. Of group (77%) gave definite history of one or more previous attacks (usually mild). Pathologically: 61% (inactive) 36% (peritonitis, acute suppuration), obliteration of lumen (3%).

14. 361 were instances of acute appendicitis, mortality rate (6.4%). Without peritoneal involvement 72 cases - 1 death (1.4%). 1/2 were mild and 2/3 moderately severe. Suppuration of wall (65%), serosa only (28%), 5 not traced.

15. Local peritonitis - 156 cases: deaths (2.5%), 84% moderately severe, 16% mild. Suppuration in wall 87%, serosa 13%. One not traced.

16. With abscess: 112 cases; deaths 9.7%, 84 were local, others were also elsewhere. 87% were severe. 92% showed suppuration in wall. 2% serosal, 7 appendix left in.

17. Diffuse peritonitis 21 cases - 8 deaths (38%). All appendices showed suppuration of wall.

18. Of 24 deaths: one was considered milk, 6 moderately severe, 14 severe, 3 moribund.

19. Time factor: diseases of appendix or regional peritoneum (36 hours) abscess (86 hrs.) generalized peritonitis (61 hrs.). <u>Note</u>: Less than abscess.

20. 9000 cases (Marsch), Mortality in 24 hrs. (1.1%), 2nd 24 hrs. (1.8%), third (4.8%) four and over (11.7%).

21. Degree of leucocytosis (generally) indicated resistance, neutrophil increase (severity) of infection.

22. High fever is the exception, rectal findings were positive in about 2/3 of cases examined.

23. Positive urinary findings may be associated (reds, pus cells) found in 28 cases.

24. Gross mortality was 3.4% (including intervals), 636 operations done by 16 fellows. Appendectomy is done unless too difficult (abscess). Drainage in 204; not in 482.

25. Over 70% of deaths occurred before 15 or after 40, which includes only 30% of cases. Children under 12; mortality 6.3%. Adults over 40, 16.%.

26. Death is usually due to peritonitis and complications. Males predominate. <u>Note:</u> authors are to be commended for excellent report.

<u>2</u>. <u>Peritonitis:</u>

Correlation of bacteriology of exudate and clinical course in 106 cases <u>Meleney</u>, <u>F. L.</u>, <u>Harvey</u>, <u>H. D.</u> and <u>Jern</u>, <u>H. Z.</u>, Arch, Surg. 22, 1-67 (Jan.) 1931. Review of literature, methods, results in various groups, summary, conclusions. After study of 106 cases authors made following summary of results. <u>Abstr. Randall</u>.

1. Most frequent cause of peritonitis in general hospital is lesions of appendix.

2. If inflammation is limited in extent few organisms are found on smear or culture.

3. If perforation has not taken place disease is usually not fatal even

if gangrenous or simply inflamed, course is usually mild (average stage about 2 weeks).

4. If perforated, exudate is profuse and yields many organisms of several species. Frequently fatal, stormy course, stay usually over four weeks.

5. In gangrene of appendix, 30 cases, spore forming anerobic bacteria (pathogenic or non-pathogenic) are not particularly active; e.g., C. welchii (40%), B. coli (100%). Without perforation and gangrene, C. welchii (none). Of six cases of perforation with death, C. welchii in 2 only, which is lower than whole group of perforated appendices. All gangrenous (perforation and non) group compared with non-gangrenous group showed same incidence of C. welchii. Note: this is in accord with clinical results of treatment with antitoxin in most series. See - Jennings, J. E., Ann. Surg. xciii, 828-837 (Apr.) 1931. First series (no serum) 35%, second series (with serum) 24%. Believe it should be tried byt consider results inconclusive.

6. Perforation of small intestine is serious lesion. High openings show none to few organisms and no growth in early cases. Lower perforations were invariably fatal. Growth was profuse in all. In non perforative lesions (obstruction) only few organisms are seen.

7. Perforation of large intestine cause slower development of symptoms (older people). More bacteria usually found including C. welchii in all with recovery in 4 of 5.

8. Perforation of gall bladder was always fatal. Bile irritation followed by organisms?

9. Time factor is very important in all types. 60% in 24 hours showed mild reaction, exudate not profuse, lesion local, organisms rarely seen. Later, just opposite was case, 33% died. Abscess mortality was 1/2 of diffuse group. B. coli, green streptococcus, (commonest organisms) C. welchii were greater in diffuse than local, but still greater in abscess than diffuse (with lower mortality).

10. When smears showed no organisms and cultures no growth or when fewer appeared in culture than in smears every patient recovered (prognostic value). When more kinds appeared in cultures than smears, one fifth died. When all forms on smear grow out in culture, more than one-fourth died.

11. According to number of organisms 35 (0), 11 (1), 14 (2), 15 (3), 19 (4) 9 (5), 3 (6). Symptoms and signs increased in severity with number.

12. Non-hemolytic B. coli 87% of positive cases green streptococci 49%, C. welchii 38%. Altogether 23 different groups were found.

13. In only 11 of 71 cases with growth, was a single organism found. Importance of any one seemed to depend more on number than virulence. Any grouping to bring out importance of single group is nullified. C. welchii, anerobic streptococcic and diphtheroids do not change outcome.

14. One third of patients were less than 20, none died. After 40 mortality is higher.

15. Variations in outcome in same age group with same organisms indicate factor of individual resistance.

16. Intestinal juices play most important role in higher mortality of perforative lesions.

Summary: Comparison of smear and culture is of prognostic significance. Peritonitis is usually polymicrobic; often due to B. coli, green streptococcus and C. welchii. Special technique and media are described.

3. The Ochsner-Sherren (Delayed) treatment of Acute Appendicitis. Bailey, H., Brit. Med. Jour :140-143 (Jan 25) 1930. Abstr. Randall.

1. Definition: preparation for operation carried out under surgical auspices. For cases too late for early operation (progressive?) or too early for late (abscess?).

2. Indications: If diagnosis is made in 48 hours immediate operation is advised. If over 48 hours question of immediate operation should be raised? Note: treatment takes into account natural course of disease.

3. Treatment: High Fowlers, no drugs, no enemas, water only?, hourly pulse records (not temperature), records of vomitus (until 5th day) or definite

signs of operative interference develop.

4. Contra-indications: against expectant treatment are to be made matters of surgical judgment, i.e., under 5 years hyperesthesia, early general peritonitis, recent powerful purgatives, etc.

5. Results: Acute appendicitis (315) (1) 242 were operated on within 6 hours including 24 with general or severe peritonitis - deaths 4. (2) Delayed 73 cases-deaths 1. Appendectomy in 4 (weakened on non-interference) - 1 died. Abscess drainage 12 (right iliac 8, pelvic-rectum 4). Total mortality 1.75%.
Impression: In addition to above the following papers have been reviewed:
1. Ochsner, A.J., New Orleans M. and Surg. Jour. 81; 102-111 (Aug) 1928.
2. Ochsnor, A., and Schmidt, E.R., Surg. Clin. NA 5; 911-913, 1925. 3. Nather, C. and Ochsner, A., S.G.O. 40; 258-263 (Feb) 1925. 4. Ochsner, A., Gage, J. M., and Garside, E., Ann. Surg. 91; 544-573, 1930. 5. Muller, G.P., Penn. Med. Jour. 23, 238-240 (Jan) 1930. 6. Ginn, C., Amer. J. of Surg. 9; 512-519, (Sept) 1930. 7. Cohn, I., N. W. Med. 27, 505-513 (Now) 1928.
8. Brooks, C. D., J. Mich. State Med. Soc. 28; 112-114 (Feb.) 1929. 9. Wilke, D. P.D., Practitioner 123, 233-240, (Oct.) 1929. 10. Maes, V., Amer. J. Surg. 6; 169-174 (Feb.) 1929. 11. Cope, Z., Brit. Med. Jour. (Jan) 1929. Review of these and other publications raises question of wisdom of dictum "Every patient should be given benefit of immediate operation?" Suggest seminar on subject?

4. Material (Randall)
(1) From January 15, 1929 to January 15, 1931, 253 appendices have been removed (U.H.). This does not include any appendix removed as part of another operation. Only those showing active inflammation with symptoms are studied here (126).

2. Types: a. inactive 112 (including 12 obliterative) no evidence of microscopis exudate in 3 blocks (proximal third, midale, distal) 44.2%.
b. active (microscopis exudate) 141-55.8%. Tasche and Spano (31.7 and 68.3%) Note: increase of inactive group - 12.5% greater probably due to sending back fewer cases in interval group without operation.
3. Sex: active inflammation (no inactive interval serosities or obliterative included) males 80 (63.4%), females 46 (36.3%). Tasche and Spano show almost equal ratio of males and females when all are included, more males than females in acute group (60.9-39.1%); more females than males in interval operation (61.4-38.6%).

4. Age: Up to 5 incl. (2); 6-12 (17); 13-21 (66); 22-35 (34); 36 on (9). Tasche and Spano found 75% in 2nd and 3rd decade in all. Present series: 80% (13-35), 20% below 13 and over 35, (2-1) in favor of those below 13.

5. Acute attack: types - a. serositis (10); b. acute suppurative (106); c. with fecolith or obstructive lumen and suppuration (8); d. perforation (18); e. all types of peritoneal involvement (45). Note greater number with peritoneal involvement than perforation (37 more); f. abscess (18); g. local peritonitis (19); h. generalized peritonitis (8); i. gangrene (23); j. walling off (20); free fluid (25). Note: 7 deaths all show generalized peritonitis. 1 generalized peritonitis died (developed peritonitis in clean case). 1 recovered-operated on first day (Health Service).

6. Complications: first day 7 perforation, 3 gangrene, 2 abscess (superimposed), 3 walling off, 4 generalized peritonitis, 10 local. Second day - 1 perforation, 4 gangrene, 1 general peritonitis, 1 local, 2 abscess, 4 free fluid, 6 walling off. After second day-9 perforation, 15 gangrene, 6 free fluid, 5 general peritonitis, 8 local, 11 walling off, 12 abscess.

7. Recurrent attacks: 39.6%.

8. Temperature: 98-100 (53.9%) over 101 (9%). See Tasche and Spano - same impression.

9. Pulse: below 90 (53%), over 110 (32%). Note: more rapid pulses than high temperatures.

10. Chief Symptoms: Pain (100%), nausea (68%), vomiting (67%), anorexia (22%), also chill in 5, distension 5, diarrhoea 12, cathartics 18.

11. Chief Signs: Tenderness (91%), rigidity (69%), rebound tenderness (51%),

rectal tenderness (53%), palpable masses suspected in 14, found in 6.

12. Leucocytes: 5-10,000 (23.8%), 10-15,000 (34.9%), 15-20,000 (20%), over 20,000 (19%). Neutrophiles over 80% in (70%).

13. Days: 1st day cases (12+), 2nd day (11+). Over 2nd day (16.7+). Shortest in deaths (2 days) longest with complications (46 days).

14. Complications: wound infection 16, stormy convalescence 8, obstruction, hernia, long drainage 2, pneumonia, massive collapse of lung, psychosis 1.

15. Treatment: Appendectomy 73, with drainage 53, 1 simple drainage. 1st day simple 75%, drainage 25%, 2nd day simple 33%, drainage 66%. After 2nd day simple 46%, drainage 54%. 11 delayed from 1-10 days for diagnosis, 9 had perforation, gangrene, suppuration or abscess.

16. Mortality (acute cases only) in interval group of 112 (1), active group 6 (4.9%). 4 in more than 2nd day operations, 1 one day, 1 two day.

Conclusions: Diagnosis and treatment of acute appendicitis is matter of major importance to all services (two developed in house and were not operated at once). Pathologists should contribute to better records of gangrene, perforation, bacteriology of exudate and obstructive data (appendix). Uniform record system for collection information should be developed. "follow-up" should be sent to interval cases and patients diagnosed as acute appendicitis (without evidence of suppuration). Discussion of therapy based on nature of disease (rather than routine removel of appendix) at a seminar? Check of observation that some forms of gangrene of appendix are part of process with primary involvement in cecum and ileum?

Note: It is to be remembered that results from various clinics are difficult to compare because of variable pathological and clinical standards. Our mortality rate is very low and the work of all concerned is to be commended.