VOL. III THURSDAY, OCTOBER 22, 1931 NO. 4

GENERAL STAFF MEETING
UNIVERSITY HOSPITALS
UNIVERSITY OF MINNESOTA

CONTENTS

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ANNOUNCEMENTS:

1. Lewis Gregory Cole, New York, one of America's most ditinguished roentgenologists, will discuss "The Ulcer Problem" at the Anatomy Amphitheater, today at 4:00 P.M. Long a student of diseases of the gastro-intestinal tract from the roentgenological standpoint, he will present his latest work on roentgenological correlation with pathological changes. This is an unusual opportunity for us to hear a man who for years has been one of America's greatest contributors to scientific knowledge. Today - Anatomy Amphitheater - 4:00 P.M.

2. Minnesota Radiological Society has splendid all-day meeting Saturday, October 17, as guests of Mayo Clinic at Rochester. This comparatively young organization is now one of the peppiest of our special societies. Favored by unusual leadership and a most responsive membership its possibilities are apparently unlimited. Members of similar organizations in Iowa and Wisconsin were special guests. Next meeting in Minneapolis.

3. Rupture of Uterus proved to be of unusual interest to our group last week. Chief obstetrician Litzenberg, broad-shouldered, keen, critical, as usual demonstrated how Staff Meetings can be made constructive as well as instructive. The world is a better place because of men of his type and the splendid development of prenatal care and good obstetrics in Minnesota is largely the result of his teaching and leadership.

Remarks: Both cases were infected when they arrived - both came from the same town. Transverse presentation is a frequent cause of uterine tears. The interior of the uterus should be manually explored as a routine procedure to avoid overlooking them, also a possibility after version. Pendulous abdomens should be corrected beforehand. Pituitrin is also a possible source especially if large doses are given. The present ampoules of obstetric pituitrin are purposely marketed this way to limit possibilities of injury. The second case is really the first in order of occurrence. There is no criticism of the handling of the first case (short case), the other was? In our second case, the arm was prolapsed. The version was so easy that it fooled the obstetrician. As a result, examination was incomplete, and the tear was overlooked. Subtotal hysterectomy is treatment of choice. Few tears can be repaired. The Dublin Pack is a plug which is put in the gap (not so good). Early diagnosis is essential, late treatment is not effective. Note that neither case had "classical symptoms". "Once a Cesarean, always a Cesarean" is a fallacy. Women should be allowed to go into labor except with contracted pelves and history which suggests previous infection. The obstetrician should never leave the bedside of such patients during labor. Only a small number rupture if no real mechanical indication existed the first time. Dr. Cottam reported a successful repair of a longitudinal tear in the uterus of a young woman due to pituitrin. The fetus escaped into the peritoneal cavity and was delivered through laparotomy. Beware of large doses of pituitrin. Should it ever be used during labor? Middle rate plan provoked some discussion. Comment was made on relative disproportion between surgical-tonsillectomy fees and obstetrical and medical fees. Official attendance 72.

II. CASE REPORT

ACUTE LEUKEMIA

Path. Henrikson.

Age - 8 Months.

The case is that of a white male 8 months of age, admitted to the University Hospitals 1-14-31 and died 2-6-31 (23 days). Baby was full term, normal, delivered first born child. The mother was 21 years old. Feeding - condensed milk up to 7 months, then scalded cow's milk without glucose. Four 8 oz. bottles per day. Orange juice and cod liver oil from the first month to the 7th month. Cereals and vegetables at 4 months.

Vomiting - Pallor - Irritable

12-22-30 - Vomiting began usually immediately after feeding. At least once a day and usually associated with cough.

1-7-31 - Developed pallor.

1-12-31 - Became very irritable. Saw physician who stated that spleen was enlarged and child was anemic.

Hospital

1-14-31 - Entered University Hospitals. T 103.2. Probably on a dehydration basis with probable blood discrasia contributing. Physical examination - Crying, anemic, emaciated child with loose, dry skin containing some excoriations around the buttocks. Cervical, axillary, submental and inguinal glands are all hard and large, but not fused. Lips are pale and dry. Heart is rapid. Abdomen negative. Liver palpable 2-3 cm. below the costal margin and is firm and smooth. Spleen is palpable about 5 cm. below the costal margin and notch can be felt. Impression: 1. Splenic anemia. 2. Leukemia.

Laboratory

Urine negative. Hb. 20%, RBcs 1,270,000. Anisocytosis, poikylocytosis and hypochromasia. WBcs 14,400. P 1, E 1, reticulo-endothelial 1, L 52. (Immature). Mantoux negative. Wassermann negative. Put on cod liver oil.

Progress

1-15-31 - Emesis of 6 oz. of heavily curded, sour vomitus. T 101.5.

1-16-31 - Has lost 400 grams since admission. Hb. 21%, RBcs 1,540,000, WBcs 10,800. Abdomen distended. Adrenalin M iii. Chloral hydrate gr. xv (R). T 101.

Transfusion

1-17-31 - 200 cc. of whole blood given intravenously. Emesis at 1 A.M. Refused oz. i oz. iv, and oz. vi formula. 8:15 A.M. Chloral hydrate gr. xx (R) expelled. 8 A.M. Sodium bromide gr. x. 9 A.M. Chl. hydrate gr. v (M). 1:15 P.M. chl. hydrate gr. iii (M). WBcs 8,500, T 100.4.

Cough

1-18-31 - Takes feedings very poorly but has gained 350 grams. Coughs at times. T. 100.

Refuses feedings

1-19-31 - Refused total of oz. viii formula of 33 oz. total. Hb. 40%, R 2,350,000, WBcs 4,550. T 98.6.

1-20-31 - Refused oz. v of formula. Has slight cough. Hb. 45%, R 2,630,000, WBcs 5,150, ret. 3-4%, T 99.8.

1-21-31 - Refused oz. xss. formula and water. T 99.4.

1-22-31 - Sleeps well. Regurgitated oz. iv. Refused oz. iii, T 99.4, Hb 47%, R 2,540,000, WBcs 11,550, Ret. 10%.

1-23-31 - Refused oz. vi. T 99.4, WBcs 13,850. T 99.2. Starting to lose weight.

1-24-31 - Refused oz. x. Irritable. Hb. 51%. RBcs 3,110,000, WBcs 21,850, Ret. 2-8%.

1-25-31 - Klim and cereal added to feedings. Refuses to eat solid food and oz. ii of formula. Regurgitated oz. viii. T 99.4. Still losing weight.

Puncture count up

1-26-31 - Frequent watery stools. 5 P.M. Splenic puncture. Small amount of bloody fluid. Large emesis. 5:10 P.M. Adrenalin M iii (H). WBCs 88,000. T 98.4 - 101.4.

1-27-31 - Regurgitating and irritable. Splenic puncture. WBcs 168,000. T.102.3.

1-28-31 - Regurgitating. Tube fed. WBcs 135,000, T 103.5. Gaining weight slowly again.

1-29-31 - Slept well. No regurgitation. Splenic puncture. WBcs 103,000. T 103.4.

1-30-31 - Not as active as usual. WBcs 81,000. T 103.4.

1-31-31 - Listless. Coughed. Does not take feedings as well as before. T 102. W 82,000.

Poorly

2-1-31 - Croupy cough. T 102.2. Continuous steam begun.

2-2-31 - Coughs less. Face and ears swollen. T 102.2 WBcs 110,000.

2-3-31 - Restless. Coughs considerably. T 102.2. Spleen increased in size. Walnut sized mass developing at angle of jaw on the right side. WBcs 121,000.

2-4-31 - Puffiness about the eyes still present. Refused oz. ii of the formula. Coughing. WBcs 190,000.

2-5-31 - Noisy and restless. Silver nitrate to pustules on the buttocks and neck. Refused oz. 3 of the formula. Regurgitating and coughing. Weight about stationery.

Exitus

2-6-31 - Restless. Picks at bedding. Slept well at long intervals. Refused oz. iii of the formula. No new lesions. Removed from isolation. Splenic puncture. Difficulty in swallowing. Large emesis of curdled milk. 7 P.M. Restless. 8:30 P.M. Crying and very restless. 9:20 P.M. Ceased breathing. T 102.5. WBCs 400,000.

Autopsy

The body is that of a white male infant measuring 73 cm. in length (48 om crown rump). Development is good. Nutrition is poor. Rigor is present. Hypostasis is purplish and posterior. There is no edema, cyanosis or jaundice. Marked pallor of the exposed surface. The pupils are 4 mm. in diameter. There are numerous small petechial hemorrhages over the lower abdomen. Inguinal, cervical, axillary, submaxillary and submental glands are markedly enlarged. Anterior fontanel is 4 cm. in diammeter. There is a left antecubital incised wound 1 cm. in length. The abdomen is distended. The spleen and liver can be palpated. There are 6 puncture wounds in the splenic region.

The subcutaneous fat is scanty in amount. The peritoneal cavity is under marked tension and when opened about 1 liter of bloody fluid escapes. Several large clots are found in the gutter. The liver extends 4 cm. below the costal margin in the right midclavicular line and 4 cm. below in the midline. The spleen extends 8 cm. below the costal line. The Appendix is retrocecal, long and coiled. The diaphragm is at the 4th rib on the right, the 5th rib on the left.

The pleural cavities are partially obliterated by fibrous adhesions. They extend from the junction of the anterior lateral surfaces on the right to the midline posteriorly. They are found in the same place on the left. The Pericardial Sac is apparently enlarged and is 8 cm. in width. The total thoracic width is 16 cm. When the cavity is opened, no excess fluid or hemorrhages are seen.

The Heart is very pale and the chambers are apparently dilated, especially the right. A probe passed out through the pulmonary artery finds the ductus arteriosus closed. The foramen ovale is patent. The valve edges are free. There are a few small miliary nodules near the free edge of the tricuspid valve. The muscle is pale and fairly firm. The root of the aorta is normal.

The Right Lung weighs 120 grams, the Left 100 grams. Both surfaces are pale. Practically no carbon pigment is seen. On palpation both are light and feathery.

The Spleen weighs 200 grams and shows a few puncture wounds in the surface. The edges are swollen and the notches are preserved. The surface is bluish red in color. The Liver weighs 450 grams. The surface is mottled yellowish brown. The edges are swollen. The Gallbladder is normal. The Stomach and Small Intestine are normal until the lower portion of the ileum is reached. There small nodular infiltrations are seen in the serosa. The mesentery is studded with markedly enlarged glands which are discrete and vary in size from 1/4 cm. to 3 cm. in diameter.

The Pancreas weighs 13 grams. It is pale and firm. The Adrenals are normal. The Kidneys weigh 60 grams each. The capsules strip easily exposing pale swollen surfaces. On section there is marked swelling of the cortices. Neither the spleen, liver nor kidney show definite leukemic infiltration. All are grey, cloudy and swollen. There are multiple hemorrhagic areas around the Pelves of the kidney and a few in the wall. The Ureters are normal. The Bladder is normal. External Genitalia is normal. (note- infant has been circumcised). The Lymph Nodes throughout the cavity are enlarged, especially those below the diaphragm. The peribronchial group are slightly enlarged. All the peritoneal nodes show marked enlargement. When the intestines are opened hyperplasia and hemorrhages of Peyer's patches are seen.

The Thymus weighs 7-1/2 grams and is pale and atrophic. The Thyroid is normal. The Head is not examined.

Diagnosis

1. Acute leukemia.
2. Marked anemia.
3. Hemo-peritoneum.

4. Cloudy swelling of heart, liver and kidneys.
5. Splenomegaly.
6. Pleural adhesions.
7. Hemorrhages of pelves and kidney.
8. Marked hypertrophy of lymph nodes.
9. Petechial hemorrhages over the lower abdomen.
10. Edema of the eyes.
11. Impetiginous lesions of neck and back of head.
12. Puncture wounds and petechia.

Comment
Acute leukemia in very young patient. Note resemblance to infection. Count of 14,000 on admission, 400,000 at death.

III. CASE REPORT

LEUKEMIA CUTIS. Path. Randall.

The case is that of a white male, admitted to the University Hospitals 6-12-31 and died 7-26-31 (44 days).
4- -31 - Patient was in a hospital with a cold. Stayed four or five days. Was told when he left the hospital that he had anemia. Advised to take a rest.

Weakness
5- -31 - Returned to his physician for a check-up. Complained of weakness and inability to work. The physician told patient that his anemia was improving.
5-25-31 - Weakness increased. Lumps under skin were noted. Visited several physicians in St. Paul.

Hospital
6-12-31 - Admitted to the University Hospitals. Past History: Past health very good; no childhood diseases whatsoever; no headaches; wears glasses for last six years. Ears - hearing is good. Throat - no sore throats. Neck - swelling in sub-mandibular region a "couple of times last winter." Cardio-respiratory - dull ache below sternum--like pressure pain; no precordial pain; no palpitation nor tachycardia; no dyspnea nor edema; has lost some weight (amount not stated). Gastro-intestinal tract - appetite not very good. Weight - present 143, best 155, normal 150+.
Family History - essentially negative. **Patient works** on father's farm. Physical examination: Patient is a white male, who is well-developed and well-nourished. He is very cooperative and does not appear to be very sick. Can walk about in corridors. Head - hair is thin, clean and of fine texture; some seborrhea and small pea-size nodules on top under scalp. Eyes - clear; no conjunctivitis nor scleritic. Ears - no discharge; grossly negative. Nose - grossly normal. Throat - red but not infected; tonsils present; tongue coated slightly. Mouth- teeth fair; no ulcerations; mucous membranes normal. Neck - cervical adenopathy. Chest - Normal contour; equal expansion; no visible pulsations; no dullness nor hyperresonance. Lungs - No rales; no increased tactile fremitus nor vocal fremitus. Heart - no visible apex beat; some pulsations in neck vessels and at end of xyphoid process; outline appears normal on percussion. Blood pressure 144/94.
Abdomen - normal contour; no masses, tenderness, rigidity nor distension. Genitals - normal. Extremities - O.K. Reflexes - all normal. Skin - nodules varying from pea-size to size of lime under skin of back, chest, abdomen and scalp. Large nodules under jaw. Those in inguinal region are large, discreet and not painful and are red on the surface. No nodules on legs. Few scattered over arms.

Laboratory
Urine - cloud of albumen, numerous granular casts, many wbc's and occasional rbc's. Blood - Hb. 89%, wbc's 11,300, Pmn 14, L 17, Stem 6. Promyelo 15, Myelo 9, Metamyelo 1, Reticulo-endothelial 33. Smear shows not unlike myeloid cells (early), immature lymphocytes and irritation cells (reticulo-endotheliocytes).
Progress: No acute pain. General diet.
6-14-31 - No complaints. Usual day.
6-15-31 - Temperature 103-104. Pulse 100-110. Nauseated. Had emesis. To stay in bed until temperature becomes normal.
6-16-31 - Urine - trace of albumen, numerous granular casts, 3-4 wbc's per high power field, 10 - 20 wbc's per high power field. Feels comfortable. Temperature still elevated.

Chest
6-17-31 - Blood chemistry - NPN 23.0.

X-ray of chest - There are several calcified tubercles at the right base and a moderate amount of calcification in the right hilus. Some thickening of the pleura is present on this side. There is considerable increase of markings throughout almost the entire right lung field and also a somewhat similar appearance at the left base. The appearance would be consistent with leukemic infiltration, but is not characteristic. Suggest follow-up examination in about one week. Conclusions: Calcified tubercles, right base. Calcification in right hilus. Thickened pleura, right. Possible leukemic infiltration of lung fields. Platelet count 128,000. Comfortable. Feels nauseated.

6-18-31 - Blood - wbc's 11,150. Nauseated. Perspiring. Skin very damp. Emesis of 400 cc. greenish fluid and undigested food. Takes fluids well. Another emesis but of yellowish fluid, 100 cc. Temperature 101.6 to 104; Pulse 80 to 135. Intake 4350 cc., output 1850 cc.

Skin Biopsy

6-19-31 - Skin biopsy. Diagnosis by skin pathologist - lymphatic leukemia. Temperature and pulse still high. Patient feels quite weak. Appetite poor. Fluid intake good.

6-20-31 - Blood - wbc's 6,400. Vomiting. Perspiring. Complains of gas pains. Soap suds enema with fair results.

Renal Function

6-21-31 - Urine - Dilution and concentration test.

8 A.M.	125 cc.	1,015
9 A.M.	125	1.010
10 A.M.	90	1.009
11 A.M.	95	1.008
12 Noon	55	1.020
3 P.M.	170	1.015
6 P.M.	115	1.020

(For eye consultation done on this date see 6-26-31).

P.S.P. --	1st hour	9%
	2nd hour	7%
	Total	16%

Urine - 2+ albumen, numerous granular and hyaline casts, 5 to 10 wbc's per high power field, occasional rbc's. Positive Wassermann on three occasions.

Skull

6-22-31 - X-ray of skull - Conclusions - negative skull. Blood - Hb. 65%, wbc's 2,600, rbc's 4,220,000. Blood Wassermann positive. Spinal fluid - clear; colorless; pressure 100/300; few rbc's; 12 wbc's; Nonne, Noguchi, and Wassermann (St. Board and Larson) positive. Colloidal gold negative. Patient seems excited most of time. Temperature 102 to 103, pulse 125 and respirations 22 to 32. Intake 2650 cc., output 1100 cc.

6-23-31 - Blood - wbc's 2,100.

6-24-31 - Platelet count 98,000. Stool specimen - negative for benzidene. Sputum - grossly blood streaked, rbc's, fat globules, negative for tubercle bacilli. Patient's condition about the same. Pulse 120, temperature 100 to 103. Appetite poor. Fluid intake good.

6-25-31 - X-ray of chest - Conclusion - infiltration of lung fields, increased, possibly leukemic. Temperature 101 to 102, pulse 100 to 120 and respirations 24 to 30.

Ulcer

6-26-31 - Gastro-intestinal study - Duodenal ulcer. Patient seems better, especially mentally.

Eye

6-27-31 - Quinine sulphat gr. v t.i.d. Patient is feeling much better. Temperature and pulse still elevated. Eating better. No complaints. Blood - Hb. 53%, rbc's 3,760,000, wbc's 6,180. Eye consultation - (should be under 6-21-31) - O.D. - Media clear. Blurred fundus. No hemorrhages nor exudates. Blood vessels negative. Optic nerve shows marked blurring of margins except temporal margin. Physiological cup visible. Blurred area over nerve margin. Continues over into retina. O.S. same findings with even more blurring of nerve edges. Diagnosis: Secondary optic neuritis. (Etiology undetermined.)

7-1-31 - Patient says he feels fine this morning. Temperature 100 to 101, pulse 80 to 100 and respirations 20 to 28. Intake 2250 cc., output 1700 cc.

Otitis Media

7-2-31 - Ear, eye, nose and throat consultation - Canal almost blocked by a hematoma. Drum cannot be seen. Pulsating, serous discharge. Diagnosis: Otitis media, acute suppurating. Treatment - dry wiping with very small applications.

Patient complains of pain and ringing in ears and also some disturbance of hearing. Quinine discontinued. Given aspirin gr. v and pyramidon gr. x for pain. Right ear has been draining all day. Some mastoid tenderness. Given salicylate for pain.

Cerebral

7-3-31 - Patient remains about the same. No improvement. Temperature 104.4, pulse 140 and respirations 32. 1:55 A.M. - patient had a severe bilateral twitching, lasting 2 or 3 minutes. Eyes stary and pupils dilated. Slightly formed saliva at mouth which is slightly frothy. Would not respond for several minutes after attack. Did not bite tongue or have involuntary urination. Perspires some. Pulse became very fast and respirations noisy and labored. 2:15 A.M. - patient is bewildered now and very weak. Pupils are still dilated. Attack must have come on without warning because patient appeared as usual 15 minutes before attack. 2:26 A.M. - pulse 128 now, not as fast as during attack. 2:50 A.M. - eyes are no longer dilated. Appears and acts as usual. Does not know he has had an attack. 2:45 P.M. - considerable discharge from ear. 3:45 P.M. - No pain.

7-6-31 - Taken again to Nose and Throat Dispensary - ear less painful but still draining.

7-7-31 - Temperature 98 to 104.6. Pulse 80 to 130. Respirations 20 to 36. Intake 3950 cc., output 1700 cc. Subcutaneous nodules seem to be increasing in size quite rapidly.

7-8-31 - Unimproved. Sweating profusely. Right ear still discharging a moderate amount. Temperature 101 to 99 to 103. Citrocarbonate drams i. P.C. in water b.i.d. Bismogenol .5 cc. intramuscularly. Patient feels fine. Quinine gr. v t.i.d.

7-11-31 - Patient seems a little brighter. Temperature around 101. Right ear has foul odor, but no longer painful.

7-13-31 - Bismogenol .5 cc. intramuscularly. Moderate amount of drainage from ear. Temperature 99 to 101, pulse 110 to 80 and respirations 26. Condition same. No complaints.

7-14-31 - Temperature 101. No complaints. Ear no longer draining and not painful.

7-15-31 - Blood - Hb. 61% wbc's 6,300, rbc's 2,560,000. Urine - negative for albumen, trace of sugar, occasional wbc's no wbc's nor casts.

7-16-31 - Patient's condition same.

Mastoid

7-18-31 - X-ray of mastoid region - Conclusions - probable chronic mastoiditis, slight degree, right. Still complaining of pain in right ear, continuously draining. Aspirin gr. v for headache.

7-21-31 - Blood - Hb. 54%, rbc's 3,170,000, rbc's 13,200. Platelet count 160,000. Temperature 101, pulse 90 to 135 and respirations 18 to 26. Intake 3100 cc., output 1,000cc., Weight 116 #.

Eye consultation - Increased papilloedema both eyes, more marked in right. Definite increase over one month ago. No hemorrhages. No exudates. Leucemic infiltration into both scleree from 11 to 2 o'clock. Complains of pain down right eyeball. Says he feels like something is twitching his right eye out. There is a slight amount of exophthalmus on this side. Eye consultation says that there is a papilloedema, probably due to a mastoid envolvement.

Skin worse

7-23-31 - Temperature 103. Infiltrations throughout body are becoming more pronounced. Does not seem to be having any pain. Cultures from ear specimen shows short chain strep. and few staph. and gram positive bacilli. Dismogenal .5 cc. intramuscularly.

7-24-31 - Doesn't seem so well today. Pulse rapid, quality fairly good. Respirations quite rapid and shallow. Difficulty in breathing. Does not complain of any pain. Patient is very weak. Marked pallor. Pulse rapid and steady. Slight drainage from right ear. Nauseated. Vomiting.

7-25-31 - Very little change since yesterday. Gradually getting weaker. Does not take fluids by mouth well. Breathing is more labored. Blood - Hb. 55%, Wbc's 58,200, all cells are immature cells consisting of promyelocytes and stem cells.

Exitus

7-26-31 - Patient has vomited several times. Does not tolerate fluids well. Pulse 30. 8:30 A.M. - gastric lavage. 9:30 A.M. - 1000 cc. intravenous saline 10% glucose started. Codeine gr. 1/2 for rest. 3 P.M. - patient seems much weaker. Does not respond very well. Very forgetful. Cannot tolerate water.

Pulse very thready. Patient very cyanotic. 4:10 P.M. - patient expired.

Autopsy:

This is the case of a white male who is well-developed and well-nourished, measuring 175 cm. in length and weighing approximately 140#. There are small, petechial, subjunctival hemorrhages in both right and left eyes. There are also hemorrhages in the right upper lip. There are numerous, irregular areas of induration with diffuse margins, some are nodular-appearing, others showing a characteristic of coalescent with an adjacent nodule--this has caused marked induration of the skin so that it has become quite thickened. It is purplish-blue in color. This condition of the skin is more marked over the chest, abdomen, neck, back and is fairly generalized over all skin surfaces. These nodules cut with very little resistance and on section are grayish-white in color and appear to be due to an infiltrating tissue which is more or less diffuse, granular and cellular. There are no evidence of hemorrhage into these areas. Rigor is not present. There is slight cyanosis. There is no edema, jaundice nor hypostasis. The pupils measure 3 mm. in diameter, right and left. At site of biopsy incision which is well-healed in the abdomen, the infiltration has become much greater causing the skin to become more thickened here than elsewhere.

The surfaces of the Peritoneal Cavity are smooth, moist and glistening. There is a slight increase in fluid but this is not extensive. The liver is enlarged about three fingerbreadth below the right costal margin. The spleen is likewise enlarged. The organs are in normal relationship to one another. There are extensive nodular masses throughout the mesentery. The retroperitoneal nodes are extensively enlarged. There is an anlargement of all the lymphatic structures in the abdominal cavity. There are infiltrating masses present in both the parietal and visceral peritoneum. The Appendix measures 10 cm. in length. The walls are greatly thickened, grayish-white in color and on section is shown to be infiltrated by grayish white mass of tissue which cuts readily. The mucoas is smooth. In incising the pectoralis major muscles and fascia overlying it, numerous nodular infiltrating masses of tissue, measuring from 1 to 2 to 3 cm. in diameter, are found. These are imbedded within the muscle substance.

All serous surfaces of the Pleural Cavities are infiltrated by tumor masses, heretofore described. There is only slight increase in fluid. The organs are in normal relationship to one another. The pleural cavity on the right side is obliterated by numerous adhesions between the visceral and parietal pleurae. Likewise, there are numerous adhesions on the left side. The Pericardial SAC is somewhat rigid and thickened due to infiltration of the visceral serous surfaces. Likewise, the parietal serous surfaces are infiltrated by the same tumor masses. There is slight increases in fluid. Mediastinum: There is a large mass extending into the rigion of the thymus, weighing 150 Gm., surrounding the superior vena cava and also the trachea. There is definite compression of the superior vena cava at this point. On section, the central portion of this mass is somewhat degenerating and is occupied by clear fluid. The tissue cuts readily and on section shows a grayish-white, infiltrating mass of tumor tissue. The lymph nodes and the hilum are definitely hypertrophied and on section are being infiltrating by a grayish-white mass of tissue.

The Heart weighs 250 Gm. In the epicardium, there are numerous, grayish-white nodules. On section, these nodules are infiltrating the muscle of the ventricle. These infiltrations are quite numerous. The endocardium is smooth. The papillary muscles are somewhat hypertrophied. There is no evidence of other valvular disease. The Root of the Aorta is somewhat compressed by the mediastinal mass. There is also infiltration into the endocardium.

The Right Lung weighs 710 Gm., Left 600 Gm. Both lungs are diffusely thickening and non-air-containing masses are noted and on section are seen to dip into the substance of the lung. On section, the lungs show no evidence of frank pneumonia. However, the bronchi are diffusely thickened, containing very little exudate. The alveoli appears grayish-pink in color, quite firm and practically non-air-containing and fibrosed.

The Spleen weighs 1360 Gm. The capsule is smooth, moderately firm and cuts readily. On section the pulp is pink and does not scrape. The malpighian corpuscles and trabeculas are indistinct.

The Liver weighs 2775 Vm. The cortes is grayish-brown in color. There are several, small infiltrating nodules on the surface. On section, the parenchyma is yellowish-gray in color. The lobulations are somewhat indistinct. There are no infiltrating nodules seen in the substance of the liver itself.

The Gall-bladder is small and contracted. The wall is diffusely thickened, measuring about 1 cm. in thickness, grayish-white in color, and on section is noted to be infiltrated by the same grayish-white, infiltrating masses as described before in the other organs. There is a slight amount of cholesteresis present in the mucosa.

Gastro-Intestinal Tract. Along the greater and lesser curvature of the stomach, numerous nodules are seen, some of which are discreet, others coalesced with one another, and on section are soft, grayish-white and somewhat degenerating. Along all of the roots of the mesentery, these same large nodules are found, some measuring up to 4 and 5 cm. in diameter. No evidence of obstruction is seen. In the wall of the small intestine, there are numerous infiltrating nodules which are grayish-white in color and appear to have only a slightly thickened wall.

The Pancreas and Adrenals are essentially normal but are surrounded by large masses of grayish-white nodules.

The Right Kidney weighs 210 Gm. Left 225 Gm. The capsule strips with some difficulty. There are numerous nodules in the cortex, most of which are somewhat discrete, measuring up to about 4 mm. in diameter. On section, the cortex and medulla are distinct. In left kidney, there are numerous nodules along the medullary borders. These measure up to 3 mm. diameter, grayish-white in color and follow the cone formation of the medulla. The left ureter is extensively thickened throughout its course and in some places appears somewhat nodular and on section the wall is quite thickened and appears occupied by the same grayish-white infiltrating mass of tumor tissue.

Diagnoses:

1. **Leukemia.** (The type is to be finally diagnosed from the microscopic sections).
2. Leukemia cutis.
3. Generalized leukemia with infiltration of all lymphatic structures, especially the lymph nodes.
4. Leukemia infiltrations found especially in the skin, fascia, muscle, lungs, heart, liver, spleen, kidneys, intestines and ureters.
5. Incomplete compression of trachea and greater vessels in mediastinum by tumor masses.
6. Subconjunctival hemorrhages.
7. Hemorrhages into right upper eyelid.

Comment:

Both of preceding cases are unusual examples of leukemia - give false conception of average case treated. Deep therapy division knows different type again (second case) emphasizes seriousness of infection in leukemia.

IV. ABSTRACTS: TREATMENT OF LEUKEMIA

I. CHRONIC MYELOGENOUS LEUKEMIA:

Value of irradiation and its effect on the duration of life. Hoffman, W. J. and Craver, L. F. (N.Y.) J.A.M.A. 97:836-841 (Sept. 19) 1931.

1. General Statement:

"Any discussion of the value of irradiation in myelogenous leukemia must be based on a knowledge of the natural course of this disease". Comment: which is also true of the evaluation of any therapeutic agent. Difficulties: duration of life in untreated cases is not well known, comparatively rare disease, few statistics (only a few large series reported), few untreated cases since radiation has been used, early writers did not distinguish between lymphatic and myelogenous types, gradual development of disease makes exact time of onset uncertain. Usual statement, 2 to 4 years.

2. Material: Minot, Buckman and Isaacs, J.A.M.A. 82:1489 (May 10) 1924, reported 166 cases. In 130 duration of disease was known. 78 patients irradiated; 52 cases were not. Average duration of life 3.04 years in untreated group; only 0.46 years in

reated series. In present report (Memorial Hospital, N. Y.) same type of charts re used to show effects of treatment. roup is 0.4% of all types of cases seen. ince 1917, 82 patients have been seen, verage 6 a year. Of these, 7 are alive, 5 are dead. All were irradiated.

. Age: Compared with Wards series, 247 British cases (Brit. J. Child Dis. 4:10 (Jan.-March) 1917; Minots series, 66 cases. In 55% disease begins 30-50 ears. Greatest incidence 35-45 years. are below 10 (more so than lymphatic ariety?). Increases slowly (10-20) more apidly (20-30). Author - youngest 14, ldest 66 at onset. Average 38.7 years. y comparison with general population ikelihood does not increase after 30.

. Sex: Minot (collected series) 605 ases: Males 60%, females 40%. Author: 8%, 32%. Below 25, Ward found slight xcess of females.

. Symptoms: Onset - east fatigue, slight loss of weight or strength, moderate gastro-intestinal disturbances. Note: in our experience most patients describe early complaint as "weakness." Onset is insidious, usually mild. All calculations probably short by a few months. Note: this is good observation as we often accept patients' word without question in most histories of any disease. From onset to diagnosis, wide variation. Author: 1 month (15 cases), 12 years (4 cases). In 48 other cases (1.1 years). Average for all (minus very chronic cases) 9 months. Minot 1917-23 (1.24 years). Usual factor in diagnosis is enlarged spleen (77 of 82 cases at time of examination). In 27, it was reason for consulting physician. (indicating variability of reaction of patients to disease process?).

6. Duration of life: 75 treated patients (6 months to 16 years) to death. 4 long cases (11, 12.5, 16, 16.5 years). Came under treatment late in course of disease (0.33-1.4 years). For this reason they are excluded as duration of life is not due to treatment. If kept in series, average duration of life would be 8 months longer, error of 20% (Good!). Remaining 71 (irradiated) are compared with Minots 52 cases (non-irradiated ((But see next paper on arsenic therapy. Was it used as it is a very old treatment.) Result: non-irradiated 3.04 years, irradiated 3.36 years, difference 0.32 years. Age at time of development apparently not a marked factor except than duration of life is shorter in older group (which is normal, Minot). Slightly more than 1/3 die in 2 years, more than 1/2 in 3 years, 2/3 in 4 years. After discovery of splenic enlargement 2.66 years. Shortest 5 months, longest 6 years. Greatest death rate (10-20 months) after discovery of enlarged spleen. Duration in males 3.4 years, females 3.27 years. (No significant difference).

7. Treatment: 1917-23, long bones by x-ray, spleen by radium pack. 1923-26 in most cases spleen only. Since 1926 pack over spleen, anterior and antero-lateral. 6 cm. -,6000-8000 m.c. hours or 10 cm.-, 10,000 m.c. hours, single treatment. Effect usually good, no other treatment being necessary for 6 to 15 months. Reactions often severe, requiring hospitalization. Since 1926, 1/6 erythema dose daily, 4-6 days (results apparently as good). Bones treated when tender or spleen refractory. Practically no difference in splenic treatment or splenic-bone technique as to end results. Impression that anemia is not so troublesome if bones are not treated?

8. Early or late treatment? Divided into first half (57) and second half (14) cases. 1st group - average life 3.08 years; 2nd 5.08 years. Does irradiation shorten life? Note 2 years difference in results. 2nd group were not diagnosed until average 3.66 years after onset (more than 3 times as long as average patient, before severity brought them in). After diagnosis they lived only 1.33 years, which is 15 months less than average, which suggests disease was slower in evolution and about two-thirds of course was run before they came in.

9. Does treatment prolong life? Answer No. 7% lived 1 year; 32% - 2 years; 15% - 3 years; 20% longer than 5 years. After varying number of cycles of splenic enlargement and treatment each followed by remission (blood picture,

spleen, general condition) patient goes into decline which gets steadily worse and death ensues. Usually swift - may last a year (more than half in 4 months, 35% in 6 months). What does irradiation do? Spontaneous remissions are uncommon (7.7% Minot). Radiation affects last few months to over a year. By studying these periods of economic sufficiency and repeated temporary well being it is found that it is 30% longer than irradiated. In first half irradiation efficient life of patient constitutes from 70-80% of remaining life between start of treatment and death - in last half amount is left. Since Minots report efficient period has been increased 6 months.

10. Impressions:

1. 82 cases of myelogenous leukemia from Memorial Hospital (1917-31) are compared with Minots series, Harvard (prior to 1924), 130 cases.

2. Disease is infrequent (0.4% of all patients), seldom seen under 25, greatest incidence 35-45 years. Increases steadily from infancy to 30 years and then is constant in all age groups.

3. Males 68%, females 32%: (Lit.60-40%).

4. Duration from 6 months to 16.5 years (average 3.36 years).

5. Splenomegaly is usually sign which brings patient (77 of 82). Average duration of symptoms (little over year) - only 4 months longer than non-irradiated group.

6. One third die in 2 years, one half in 3 years, two-thirds in 4 years.

7. Splenic irradiation alone is as efficient as spleen and long bone therapy.

8. Repeated cycles of clinical and laboratory remissions occur under irradiation lasting from few months to a year.

9. Decline eventually comes and death follows shortly.

10. Result is 30% greater efficiency even more marked when started in first part of disease. Life is not prolonged.

2. ARSENIC AS A THERAPEUTIC AGENT IN CHRONIC MYELOGENOUS LEUKEMIA: Preliminary Report. Forkner, C. E., and McNair, T. F. (Harvard) J.A.M.A. 97:3-6, (July 4) 1931.

1. General Statement: Potassium arsenite (Fowler's Solution) was at one time standard remedy in treatment of blood diseases. Used to increase red cells, decrease leucocytes in leukemia. Quantitative blood studies (1878) showed in normal persons progressive decrease in both red and white cells; in anemia first an increase of both, then a progressive decrease in myelogenous leukemia, a progressive decrease to normal of white cells spleen decreased in size, and clinical improvement resulted. Isolated reports followed (small series) no definite assurance treatment produced effect. 1903, radiation was started and arsenic treatment was stopped. Authors restudied problem by treating 10 cases of chronic myelogenous leukemia (9 responded favorably, 1 in terminal phase did not.)

2. Material: 10 cases (all had been treated by radiation but came back for remission treatment). Quantitative studies were made and effects were identical with irradiation. Cause of response is unknown. In addition anemia is apparently arrested and hemoglobin returns to normal. As leucocytes fall, maturity returns, also relative increase in monocytes, bosophiles and nucleated reds. Platelets remain normal thruout. Size of spleen and liver is reduced, in 2 cases to non-palpable state. Biopsy of bone marrow suggests normal type after treatment. Basal metabolic rate returns to normal. Patients gain in weight and feel very well. But the effects change at once (few weeks). If small doses are used after therapeutic effect remission may be prolonged a few months.

3. Impression: Rapid and relentless administration of potassium arsenite to desired effect or beginning signs of intoxication, causes remission in chronic myelogenous leukemia similar to radiation. If the drug is resumed after a week's rest in smaller doses remission may be prolonged, otherwise it only lasts a few weeks. Blood control studies are necessary as in radiation to control dosage. Studies will be continued.