

# BULLETIN OF THE LYING-IN HOSPITAL OF THE CITY OF NEW YORK.

Vol. IV

DECEMBER, 1907.

No. 3

---

## PHLEBOTHROMBOSIS, WITH REPORT OF A CASE.

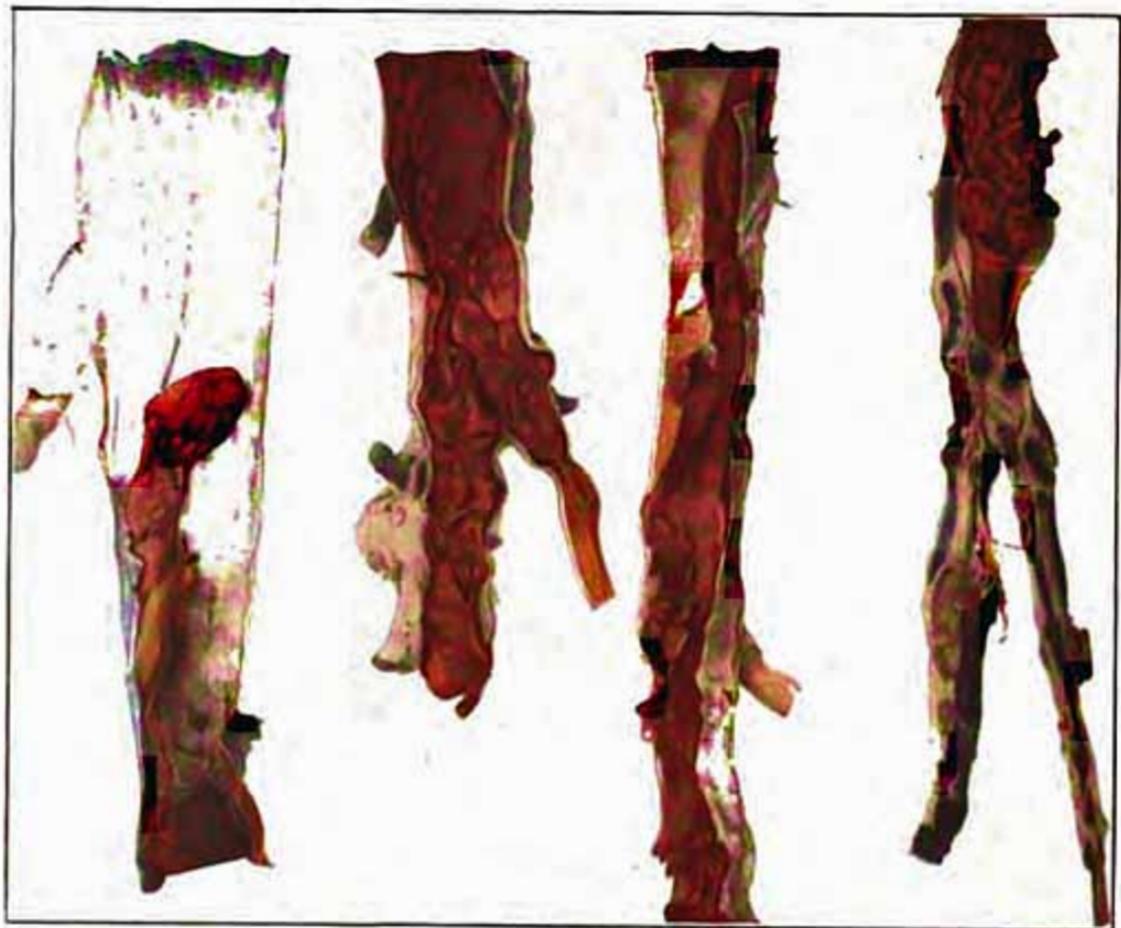
BY J. E. WELCH, M.D., Pathologist.

Phlebothrombosis very frequently occurs in the veins of women after childbirth. The condition is usually a local one, affecting the pelvic veins, without external evidence, or extends to the iliac veins and is followed by more or less painful œdema of the leg and thigh. The etiology of the condition is not always apparent. The treatment by immobilization, rest in bed and protection, on which obstetricians so generally agree, is very successful and recovery is the rule. Extension of the thrombosis to the large venous trunks of the vital organs is not so frequently met with, and for this reason it was decided to make a somewhat detailed report of the findings in a case of post-partum venous thrombosis, which developed in a patient who was sent to the Lying-in Hospital from an institution for homeless women. She was admitted to the service of Dr. J. W. Markoe and gave the following history: Age, 24; born in Russia; para I., single. The family history is negative. She denied having had any of the usual diseases of childhood. She first menstruated at 14 years and has always been irregular. She never had rheumatism and denied venereal diseases.

*Present History:* Was admitted on December 7, 1907. She stated that she had been perfectly well during her pregnancy, except for some headache and pain over the cardiac area.

Physical examination shows a woman 5 feet 5 inches in height; weight, 130 kilos; fairly well nourished, complexion rather sallow; pelvic measurements normal. Urine examination December 10th showed the following: acid, 1,021, a very faint trace of albumin. The microscope showed a few pus cells, but no casts.

Digitized by Google



The temperature for the 10 days she was in the Hospital before her confinement was normal, but the pulse ranged between 85 and 110, averaging above 90 for the entire period.

On December 14th examination of the blood showed: red cells, 4,310,000; hæmoglobin, 60%; color index, 0.6; leucocytes, 14,200; small lymphocytes, 10%; large lymphocytes, 26%; polymorphonuclear neutrophiles, 63.5%; eosinophiles, .5%.

The patient complained of continual pain in the cardiac region until December 15th, when she went into labor, which lasted 36 hours without any apparent complication. The child was living and the patient was put to bed in good condition.

At 4 o'clock the following morning she complained of very severe pain in the left leg, the most painful spot being the centre of the calf. The leg was swollen and cynosed as far up as Poupart's ligament. The respirations were somewhat shallow, but not greatly increased in frequency.

A soft, inconstant systolic murmur was heard over the base of the heart. On December 20th, the fourth day after delivery, a blood culture taken from the left median basilic vein failed to develop any growth. The patient's condition grew steadily worse, with air hunger and attacks resembling catalepsy at infrequent intervals, with increasing shallowness and rapidity of breathing and an increase of the pulse rate to 138. The temperature rose on the third day after delivery to 101°, but in the next 24 hours returned to normal and fluctuated after that between normal and 100, until the day of death, which was on the sixth day after labor. (See appended copy of temperature chart.) A post-mortem examination was made 24 hours after death, of which the following is a record:

Pathological, No. 2092. Pauline F., age 24, A. N. 19063. Died December 22, 1907. Autopsy, December 23, 1907.

#### POST-MORTEM RECORD.

*Body:* Is that of a white female, well developed and fairly well nourished. The frame is medium build. There is a slight post-mortem hypostasis. The left leg and foot are slightly swollen. The superficial lymph nodes are palpable in the left inguinal and both epitrochlear regions. The pupils are equal and widely dilated.

Digitized by Google

Registration No.

SOCIETY OF THE  
**LYING-IN HOSPITAL**  
 OF THE CITY OF NEW YORK

Application No. 17063.

Diagnosis **Varicella; L.O.A.**

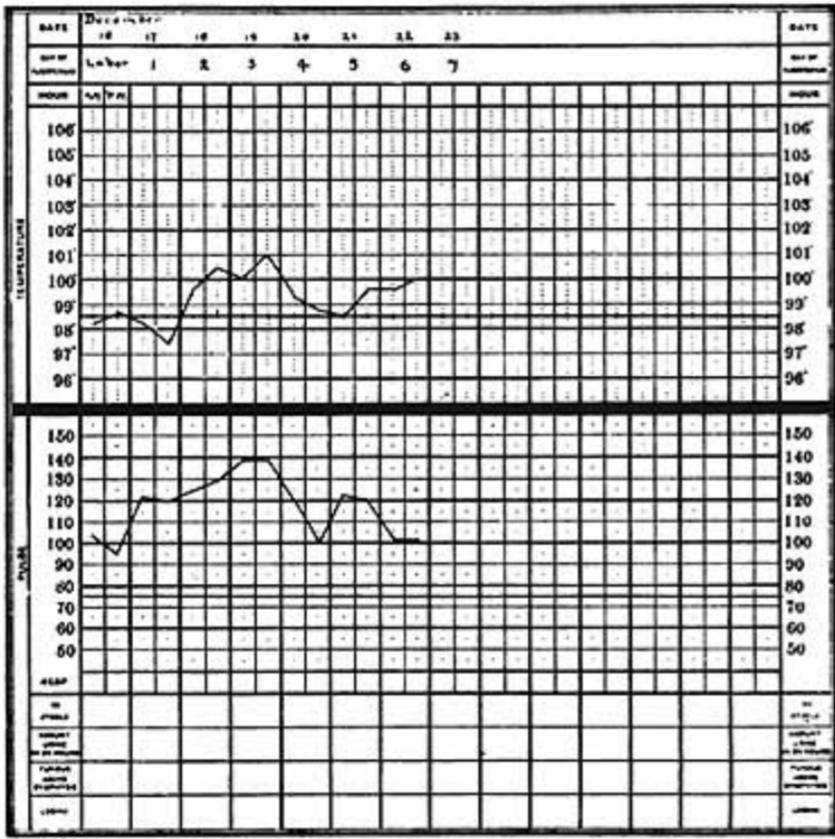
Name **Pauline F.**

Address \_\_\_\_\_  
 Street \_\_\_\_\_

Floor \_\_\_\_\_

Natural Residence \_\_\_\_\_

Page **T**



Temperature and Pulse in the Case of Thrombo-phlebitis described in Dr. Welch's Paper.

## EXAMINATION OF THE HEAD.

*Scalp tissues:* Normal.

*Skull cap:* Normal in density and thickness.

*Dura mater:* Slightly congested, not thickened.

*Pia mater:* Slightly congested, not thickened.

*Brain:* Symmetrical and well developed. There is a slight general congestion. The ventricles are filled with a colorless watery fluid.

Microscopically, the neuroglia appears normal, the blood vessels are congested and many of them are surrounded by serum. The protoplasm of the pyramidal cells of the cortex, the large cells of the basal ganglia and cells of Purkenje show a slight clouding. The nuclei appear normal. The endothelium lining the ventricles is intact and appears normal.

*Middle ear cavities:* Normal.

*Pituitary body:* Normal.

## SECTION OF THE BODY.

*Paniculus:* Moderate in amount and light yellow in color.

*Muscle tissue:* Well developed and normal in color.

*Mammary glands:* Small, filled with normal secretion and microscopically appear normal.

## EXAMINATION OF THE THORAX.

*Retrosternal glands:* Not enlarged.

*Pleural cavities:* There is an old slender adhesion stretching from the dome of the right pleural cavity to the apex of the right lung. There is about one ounce of serous fluid in the left cavity, but no adhesions.

*Pericardium:* Covered by a very thin imperfect layer of fat. The wall is very thin. The cavity contains about half an ounce of straw-colored fluid.

*Heart:* Superficial vessels are congested. The epicardium is slightly thickened along the vessels. The chambers are all dilated and contain red and chicken-fat clot. Both auriculo-ventricular openings admit four fingers. The foramen ovale is patent but is guarded by a semilunar valve formed from the interauricular septum. The dilatation of the heart has caused the free edge of the valve to recede from the margin of the foramen  $\frac{1}{2}$  cm. The valves

and endocardium are normal. The myocardium is thin, flabby and pale.

Microscopically the fibrous tissue about the larger branches of the coronary arteries is moderately increased. About some of the smaller vessels it is very much increased. The vessel walls do not show thickening. The muscle cells show clouding of the protoplasm. The striæ are obliterated and the nuclei are obscured. There is no excess of pigment about the nuclei. The nuclei vary considerably in size and shape, but they are well preserved. Culture from the blood of the right auricle shows no growth.

#### RESPIRATORY SYSTEM.

*Larynx:* Normal.

*Trachea:* Shows slight congestion of the mucous membrane.

*Bronchi:* Show congestion and are filled with fluid of œdema.

Microscopically they show extensive desquamation and the small and capillary bronchi and infundibuli are filled with hyaline fibrinous exudate, in which are mixed a very few epithelial cells and leucocytes.

*Lungs:* Both congested and very œdematous. The pleura is not thickened. The lower branches of the pulmonary veins are occluded by very firm mixed thrombi. In places the central part of this clot has softened to a puriform fluid. Culture from one of these softened areas developed *no growth*. In the lower half of the left upper lobe is a large area of consolidation in the stage of red hepatization.

Microscopically the fibrous tissue of the pleura and general pulmonary stroma appears normal in amount. In places the stroma shows considerable œdema, especially in the area of consolidation. The vessels are not thickened. Some of the veins show mural thrombi. There is a slight general arterial, venous and capillary congestion. The air spaces outside of the consolidated area contain leucocytes and desquamated epithelial cells in varying numbers. The epithelial cells are swollen and their protoplasm is cloudy and shows vacuoles and more or less pigment. There are small areas of atelectasis in different parts of the lungs. In the consolidated portion the exudate varies in character. The greater part is composed of fibrin, in which are a few leucocytes and desquamated epithelial cells. Intermixed with this are a number of areas of considerable

size, in which the spaces are filled with red cells. The consolidation is not uniform, there being many spaces interspersed which contain a few desquamated cells only.

#### EXAMINATION OF THE ABDOMEN.

*Peritoneal cavity:* Contains about 500 cc. of sero-sanguineous fluid. There are a few old adhesions between the under surface of the gall bladder and the hepatic flexure of the colon.

*Spleen:* Increased to about twice the normal size. The pulp is firm and slightly congested. At the upper pole there is an anæmic bland infarct about 2 cm. in diameter.

Microscopically the fibrous tissue of the capsule and septa is normal in amount. The walls of the vessels are not thickened. Some of the veins show cloudy swelling in their muscular coats and contain thrombi. There is a general congestion of the pulp, which is most marked about the periphery of the organ. About the cortex and irregularly through the pulp the spaces are filled with hyaline fibrinous coagula. The Malphigian bodies show slight hyperplasia of their round cells. There is considerable granular brown pigment scattered through the organ.

*Liver:* Very much increased in size and pale grayish in color. The capsule is not thickened. Section shows general congestion. No thrombi found in the large vessels.

Microscopically the connective tissue of the capsule and the portal spaces is found normal. The hepatic veins and the capillaries are congested; the latter are dilated to equal the width of the columns of liver cells on either side, which they compress. No thrombi are found in the veins, arteries or capillaries. The bile ducts of the portal spaces are normal. The parenchyma cells are compressed more or less into very narrow cords in places by the pressure in the congested capillaries on either side. The protoplasm is cloudy and swollen, so that the outlines of the individual cells cannot be seen. There is moderate fatty degeneration of the protoplasm and there is a large amount of greenish pigment scattered through the cells. The nuclei appear normal.

*Gall bladder:* Filled with normal looking bile. The large and common bile ducts are patent.

*Pancreas:* Normal in size and slightly congested.

Microscopically the connective tissue appears normal in amount. The vessels and ducts are normal. The parenchyma shows marked cloudy swelling.

*Adrenals:* Appear normal both in gross and microscopic examination. No thrombi found in the vessels.

#### GENITO-URINARY SYSTEM.

*Kidneys:* Both slightly enlarged and pale. The capsules are not thickened and strip easily. The cortices are slightly swollen. There is slight general congestion.

Microscopically the connective tissue is found not increased. The vessels show general congestion, more marked in the medulla. There is no thickening of their walls. The glomeruli are very much congested. The epithelial cells lining the tubules of the cortex appear differently in the different tubules. In some they are swollen and cloudy and completely fill the lumen of the tube. In the greater number the protoplasm is granular and shows different degrees of disintegration, from a slight loss of substance on the side toward the lumen to a granular fringe about the basement membrane of the tube. Some of the tubules show complete disintegration or desquamation of their cells.

The pelves are normal.

*Ureters:* Both slightly dilated.

*Bladder:* Contains about one ounce of urine which is slightly turbid. The mucous membrane is congested.

Microscopically, aside from superficial desquamation of the epithelium and congestion, the wall is normal.

*Uterus:* Measures 11 cm. in diameter. The wall appears normal. There are pale thrombi in the sinuses of the inner part of the wall.

Microscopically the thrombi all show many leucocytes and the structures of the inner part of the uterine wall are infiltrated with leucocytes. Cultures from the uterine thrombi develop no growth. Stained sections show no organisms.

*Cervix:* Shows a slight bilateral laceration of the external os.

*Fallopian tubes:* Normal.

*Vagina:* Normal.

#### ALIMENTARY TRACT.

*Tongue:* Normal.



*Esophagus:* Normal.

*Stomach:* Dilated. The mucous membrane is thin and congested.

Microscopically the only change found is a cloudy swelling of the epithelial cells.

*Intestines:* Appear normal in the gross. One *ascaris lumbricoides* found in the lumen.

Microscopically there is found slight atrophy of the mucosa and more or less round cell infiltration in the stroma between the glands. There is cloudy swelling of the epithelium of the glands.

*Vermiform appendix:* Six inches long, normally situated, free from adhesions, and its lumen is patent.

Microscopically the mucous membrane shows considerable atrophy and the submucosa shows sclerosis and marked infiltration, with small round cells.

*Colon:* Appears normal in the gross. Microscopically it shows cloudy swelling and extensive desquamation of the epithelium.

#### VASCULAR SYSTEM.

*Arteries:* Show no disease.

*Veins:* The left iliac just below its communication with the vena cava contains a very firm white thrombus, which almost fills the lumen of the vessel and extends to the femoral opening. The femoral vein and all its tributaries are distended and occluded by a continuous red thrombus. The internal saphenous vein at its juncture with the femoral is occluded by a firm white clot for a distance of about one inch, below which the lumen is filled with red clot.

Microscopically the pale clots are found composed of hyaline fibrin and leucocytes. The muscular coat of the vein wall about the pale thrombi shows cloudy swelling and the fibrous tissue coat considerable oedema and congestion. No organisms found in the sections and cultures taken from different parts of the thrombus failed to develop any growth.

Thrombosis in the pelvic veins is usually believed to be the result of bacterial infection through the uterine wall, or of the products resulting from the growth of organisms in the uterine wall.

That the coagulation process has no relation to bacteria in many cases can be proven by making careful cultures. In this instance, as proof that the coagulation had no etiological relation to bacteria, we have an ante-mortem blood culture sterile, and cultures post-mortem from the uterus and veins in the pelvis, thigh and lungs sterile.

Extension of the inflammatory process through the vascular wall as a cause of the thrombosis can be disregarded, since no inflammatory process was found.

The patient was not in a cachetic condition, which would exclude the marantic type of thrombus. We have left as a possible cause pressure on the vascular wall. There are three conditions necessary to produce coagulation of the blood in a living vessel, viz.: alteration of the chemic composition of the blood, alteration in the vascular wall, slowing of the blood current. The last two may be of importance in the present case. The oldest part of the thrombus which extended into the thigh and leg was situated in the left common iliac vein at the brim of the pelvis at a point where it was subject to pressure of the gravid uterus, or to undue pressure during parturition. This pressure could be a means of slowing the blood current, and at the same time injuring the endothelium, which has the capacity under conditions of degeneration to furnish the ferment essential to coagulation. After considering all the facts in the case carefully it seems not an unreasonable assumption to attribute the clot formation in the lower veins to uterine pressure, but this hypothesis does not account for the clots found in the pulmonary veins and spleen. The fibrin ferment results from a degenerative condition either in the endothelium of the vascular wall or cellular elements of the blood, in the latter case through what is known as blood plates.

In cases of extensive thrombosis such as the present, in addition to a ferment given out by the affected endothelium, there is probably a considerable quantity formed from the disintegrating cells of the clot. This excess of ferment circulating in the blood would have a tendency to cause coagulation in favorable locations, especially where the rate of flow was slower than normal. The clots in the pulmonary veins and in the spleen may be explained in this way. In the former case the weak heart action impaired the pulmonary circulation, and in the latter a naturally slow circulation

through the splenic pulp.

In addition to the excess of ferment present in the blood there may be an insufficient quantity of anti-ferment, which is supposed to act normally as a balance.

If our conclusions in this instance are wrong, namely, "that the thrombosis had its origin in a degenerative process in the endothelium of the left common iliac vein due to pressure from the uterus either before or during labor," we have left some alteration in the chemic composition of the blood as the cause. We have no analysis to prove such a change, and in the absence of such proof feel justified in presenting this as a case of pressure thrombosis with extension, due to the presence of an excess of fibrin ferment and alterations in blood rate in different organs.

The accompanying plate (No. IX) is reproduced from a colored photograph, and shows the thrombosis in the iliac veins as described in the autopsy report above. The colors are taken directly from the specimen and demonstrate the different varieties of thrombi quite plainly.

---