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RARE FORMS OF CARDIAC THROMBI.

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We meet in the heart chambers thrombi of the following forms:

First: globular thrombi, with sub-trabecular ramifications, which are common in the auricular apendices and in the apices of the ventricles in cases of extreme dilatation.

Second: mural thrombi, usually laminated, which occur in the dilated auricles, particularly their apendices, in the ventricles in cases of fibrous myocarditis, and in aneurism of the heart.

Third: pedunculated polyp-like thrombi—a very rare form—met with usually in the auricles.

Fourth: ball-thrombi, free in the auricles, which constitute the rarest form of cardiac thrombus.

The first form, the *végétations globuleuses* of Lænnec, occurs not infrequently, and is well known. The polyp-like thrombi are very rare. Hertz[1] has collected nine cases in the literature. I have never met with an instance.

The second variety, mural, laminated thrombi, are not very uncommon, and the case here reported is of interest chiefly on account of the enormous size of the thrombus.

Ball-thrombi, free in the chambers, are excessively rare, only five cases having been recorded.

CASE I.—*Large ball-thrombus, free in left auricle; mitral stenosis.*

M. S., aged 35, admitted to Montreal General Hospital, February 8th.

For twenty years she had been subject to attacks of shortness of breath, which within the past three years had become much worse. Two years ago she had an attack of acute rheumatism, and during the past eight years she had occasionally spat blood.

In 1878 she had an attack of right hemiplegia, with aphasia. Speech returned in a few days, but the hemiplegia persisted for some

[1] Deutsches Archiv. für klin. Medicin, Bd XXXVII.

months. Within a year she had a second attack, since which time the paralysis has persisted. When admitted there was orthopnoea; face suffused; no dropsy; complete right hemiplegia; the heart's action was very irregular; pulse 112, rapid and feeble; the cardiac dullness was increased; the apex beat was normal in situation. There was a blowing systolic murmur in mitral region. Temperature 101°. The urine contained 50 per cent. of albumen. The patient became rapidly worse; cyanosis increased, and death took place on the 13th.

Autopsy.—Small, well nourished woman; ecchymoses on face and extremities. Heart large, distended with blood clots, those in the right chamber dark in color and pulpy. The left auricle was greatly enlarged, and contained fluid blood and clots. Among these was a ball-thrombus, ovoid in shape, the size of a small pullet-egg, measuring 3.5 x 2.5 cms. It was quite unattached, and lay free above the mitral orifice. It was firm and elastic to the touch, and on the surface greyish brown in color, and presented little linear fibrinous elevations, but no roughened spot as if it had been adherent to the wall. It gave an indistinct sense of fluctuation as if central softening had occurred.[1] There were no mural thrombi in the chamber. The endocardium was opaque, and the walls thickened. The right chambers were greatly dilated; the tricuspid orifice measured 12 cms. in circumference. The auricular face of the valve presented fresh vegetations, many of them pedunculated. The walls of the ventricle were greatly thickened. The mitral orifice was very narrow, just admitting the tip of the little finger; from the auricle it looked like a small button-hole. At the bottom there was a funnel-shaped depression. The edges of the orifice were thick, of cartilaginous consistence, and were fringed with small vegetations. The chordae tendineae were short, particularly those from the anterior muscle which was attached almost directly upon the flap. The left ventricle was small, the walls over 12 mm. in thickness. The aortic valves were opaque, and presented a row of vegetations.

The lungs were crepitant throughout. They were tough and brownish-red in color; they did not contain an excessive amount of fluid.

[1] The specimen is preserved in the Museum of the Medical Faculty, McGill University.

The spleen weighed 150 gms., and was very firm—no infarcts.

The right kidney presented several old cicatrics. In the left internal capsule were spots of old softening.

Of this remarkable form of thrombus, Hertz[1] has reported two cases, and refers to a third. In both of his cases there was mitral valve disease, and the ball-thrombus was found in the left auricle. One measured 2½ cms. in diameter, the other 4 cms. Both were rounded, and had a firm, elastic consistence. They were made up of fibrin externally, with a yellowish, granular, central portion, evidently the result of the softening, which so commonly takes place in cardiac thrombi.

The third case, which he abstracts, is reported by Macleod, in the Edinburgh Medical Journal, 1882–83. In this case a young man, aged 27, had symptoms of cholera, and on the fifth day was seized with convulsions, cyanosis and intense dyspnœa. Death occurred in about 48 hours. There was found in the right auricle a dense grayish-yellow, freely movable clot, half the size of a walnut, which lay above the tricuspid orifice.

In the same volume of the Deutsches Archiv. für klin. Medicin, Prof. von Recklinghausen states that he had first described[2] these ball-thrombi, of which he had seen two instances, both in connection with mitral stenosis. The thrombi were round, about the size of small walnuts, and lay free in the left auricle.

These remarkable structures are, as Recklinghausen suggests, globular thrombi detached from the auricular appendix, and, being too large to pass through the narrowed mitral orifice, are kept rotating in the auricle, growing constantly by the accretion of fresh layers of fibrin. It is not likely that they produce any special symptoms.

Case II.—*Mitral stenosis of extreme grade. Enormous dilatation of left auricle by large laminated thrombus.*

Mary J. E., white, aged 48, admitted to the Johns Hopkins Hospital, on the evening of June 20th, 1889, with dropsy and extreme dyspnœa. Married and has had five children, all of whom died when young.

[1] Loc. cit.

[2] Algemeine Pathologie des Kreislaufs, Deutsche Chirurgie, Lief, 2 and 3.

Family history negative.

She does not think that she has had scarlet fever. Has never had acute rheumatism. She has never been a very strong woman; has had shortness of breath at times for ten or twelve years. For six weeks the shortness of breath has been worse. A week ago she began to have a cough for the first time. She has been in bed for eight days, and her feet have become swollen. She has had a good deal of vomiting.

21st. Present condition. Small, spare woman; color ashy-grey; finger tips and lips blue. There is marked orthopnœa. The feet and legs are swollen. When admitted the pulse was scarcely to be felt at the wrist, and she was given two hypodermics of ether and digitalis. This morning the pulse can just be felt, but cannot be counted. Respiration 44.

Heart. Very slight visible impulse. To the hand, marked shock, especially in epigastrium. There is an indistinct thrill. Dullness extends from the upper border of third rib, and to the right is two finger's breadth beyond the margin of sternum.

On auscultation, below the nipple there is a continuous rapidly succeeding series of sounds, the first and second not distinguishable from each other, and the long pause is absent. *There is no murmur.* At lower sternum the first sound is distinguishable. It has a ringing, echoing character. At the base the second sound can be distinguished from the first, and is loudest at left margin of sternum. Most careful auscultation fails to detect a murmur at any of the cardiac areas.

She was ordered hypodermics of ether and tincture of digitalis every three hours. In the evening she seemed somewhat better, the distress of breathing was not so extreme. There was dullness at the left base, as high as the angle of scapula, with feeble breathing.

22nd. The pulse can scarcely be felt. In the mitral area the first sound can be distinguished from the second, and the diastolic pause is more marked. *There is no murmur.* The second left at base is ringing. On palpation the shock in lower sternum is very marked. The discrepancy between the loud, clear ringing sounds, with the moderately forcible impulse of the heart, and the extremely shabby, scarcely detectable pulse is very marked. The urine is scanty and difficult to obtain; it contains a trace of albumen.

The cyanosis became more intense. She got much worse during the night and died on the morning of the 23rd.

A diagnosis of mitral stenosis was made. The absence of murmur was thought to be due to the condition of enormous dilatation of the left auricle.

Autopsy, by Dr. Welch. Multiform ecchymoses on the skin; œdema of the legs; face cyanosed.

In peritoneum, about 150 cc., of clear yellowish serum.

Thorax. The right pleura was everywhere adherent; the left pleura contained 1,500 cc. of serum.

Lungs. The right main pulmonary artery entering the lower lobe was occluded by a firm, greyish-red thrombus which extended only a short distance into the branches of the artery. There was well marked brown induration of the organ, with desquamative heart-pneumonia. The substance was dry. In the left lung the left upper branch of the pulmonary artery was completely occluded by a greyish-red, laminated thrombus. The pulmonary artery and its branches in both lungs were extensively atheromatous. The substance of the left lung was much compressed; it was also in a state of brown induration. There were no infarcts.

Heart weighed 16 oz. (453.6 gms.) (due largely to enormous thrombus in the left auricle). The left ventricle was not hypertrophied or dilated. It appeared to be normal in size, and measured 9 cms. in length. The walls were 1 cm. in thickness. The aortic valves were slightly thickened along the lines of closure; otherwise they were normal. The mitral orifice was extremely stenosed. The segments were completely and firmly united to each other everywhere, except at the aortic extremity of the orifice, where there was an opening measuring about 5 mm. in diameter, which scarcely admitted a small lead pencil. The united segments were thickened and calcified, but the surface was not rough, saving to a little extent on the auricular face. There were no vegetations. The chordae tendineae were thickened, and the tips of the papillary muscles fibroid. The left auricle was greatly enlarged, measuring 10 cms. transversely and 7 cms. vertically. The muscle wall was greatly hypertrophied, measuring 6 mm. in thickness. The endocardium was thickened and opaque. The chamber was nearly filled with an ante-mortem thrombus, laminated, partly grey and partly red. Over a greater part of its extent it was firmly

adherent to the wall of the auricle; in other places it was loosely adherent. The thrombus partly occluded the mouths of the pulmonary veins, but there were channels through which the blood could flow. The thrombus had undergone softening in various parts. The pericardial surface of the left auricle was thickened and opaque. The right ventricle was markedly hypertrophied and dilated. It was 9 cms. in length; the walls averaged 7 mm. in thickness. The muscular trabeculae were thickened, and the tricuspid orifice admitted readily four fingers. The segments of the valve were normal, saving a little diffuse fibroid thickening. The right auricle was also much hypertrophied and dilated; its walls measured in places 4–5 m.m. in thickness. The hypertrophy was especially well marked in the trabeculae. The cavity of this chamber was much dilated, measuring at the longest about 8 cms. The coronary sinus was greatly dilated. The pulmonary valves were normal. The pulmonary artery presented several opaque yellow atheromatous patches. At its bifurcation there was a parietal thrombus, which became an occluding thrombus in the vessels going to the left lower and to the right upper lobes, as already described.

The spleen weighed 3¼ oz., (92.14 gms.) dark-red in color.

The kidneys presented patches of atrophy on the surface. The striae of the cortex were distinct. The consistence of the organs was increased. The renal arteries were atheromatous. The liver weighed 33 oz., (935.5 gms.) and was in a condition of red atrophy.

Mural thrombi are quite common, particularly in the auricular appendices, but they are usually small. Massive coagula, with extension into the vessels, such as existed in this case, are extremely rare, and occur chiefly with mitral stenosis. Cases are on record in which the thrombus has passed through the narrowed mitral orifice.

Clinically the case is interesting as illustrating the disappearance of the murmurs in the last stage of mitral stenosis, not an uncommon event when the left auricle becomes over distended. There were no symptoms which could be directly referred to the blocking of the auricle with thrombi, none which we do not meet with in extreme grades of dilatation of this chamber.