BRITISH MEDICAL JOURNAL:

BEING THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION.

EDITED BY ANDREW WYNTER, M.D.

No. CLIX.]

LONDON: SATURDAY, JANUARY 14, 1860.

[NEW SERIES.]

Vacation Lectures

OR

FIBRINOUS DEPOSITION IN THE HEART:

ITS HISTORY AND PRACTICAL MEANING.

DELIVERED AT THE GROSVENOR PLACE SCHOOL OF MEDICINE.

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LECTURE I.

INTRODUCTORY REMARKS; *Plan of the Course*; *Different conditions of Blood in the Heart after death*. FIBRINOUS CONCRETIONS IN THE HEART: *their Forms*; *Structure*; *Weight*; *Chemistry*; *Process of Deposit*; *Post Mortem and Ante Mortem Deposits*.

GENTLEMEN,—I have asked you during this Christmas vacation to meet me here, that we may consider together a subject of much historical and practical interest. I know that it may be considered, by indolent men, as no charitable act on my part to break in upon your holiday time, and to ask you, after your past heavy work, to give up even an hour of the festive season to listen to a lecture of a scientific kind. At the same time, I offer no apology for the act. I have a purpose in it; and that purpose is based on three reasons.

In the first place, I am anxious in these lectures to supplement certain observations which were made to you at that period in the physiology course, when the nature and properties of the blood were under review. I glanced then at the subject which is now to enter into our thoughts; but the time at disposal prevented me from filling up an important gap in our studies. In the second place, I am desirous to lay before you certain views which I have now held for a period of ten years, and which, scattered about in stray papers and communications, have never, until this present attempt, been systematically collated and arranged. Lastly, I wish to prove to your minds that the subject to be discussed is one which will prove to you, if I am correct in the readings I have to give of it, of solemn interest whenever the onerous duties of practice fall to your lot. For it will be my endeavour to point out in these lessons that, in the vast majority of acute inflammatory affections, the fatal result which, despite our science, is too commonly the grand *ultimatum*, is due not so often to the local lesion which we in common parlance are accustomed to call the inflammation, but to a deposit in the heart of a part of the fibrinous constituent of the blood. And, inasmuch as the cases of the nature here mentioned will constitute the larger portion of disease coming under your practice, the subject is one, I repeat, of solemn interest to each and all of you, if I am correct in my interpretation of it.

In these lectures, I shall enter in no way into matters of theory. I shall confine myself purely to what is observed at the bedside, and at the *post mortem* table. Truly, even into these observations theory may largely enter, and a captious critic might suggest that all such observations are based on theories. Anyway, I shall try to avoid the theoretical, and to adhere to the presented facts and phenomena. I might enlarge very greatly in this lecture on various topics collateral to the one given in the title. It would be fair to take up the consideration of fibrinous masses in the extremities of arteries, and in venous trunks, and of their effects in these parts. But we will, if you please, leave these topics for a future occasion, and adhere at this moment to the one point—

deposition in the heart, the deposition occurring directly from the blood.

Without further prelude, then, we will pass to the subject proper. Let us first touch upon it in its pathological aspects.

On opening the bodies of the dead, we find any blood that may be in the heart in one of three conditions.

(a.) As a coagulated red clot, but with no surrounding serum. In this latter respect, the blood differs from ordinary blood drawn from the body, and set aside for coagulation. It must not be assumed, however, that in the dead body serum does not separate. It does separate, the same as in cases where blood is drawn; but it appears to me that for some time after death an osmotic action is continued in the body, by which the serum is removed. When, some hours previously to the injection with wax, the vessels of the subject preparing for dissection are injected with a watery solution containing arsenic or sulphate of zinc, the solution thus thrown in does not remain in the vessels; it is absorbed and received into the soft parts, where the capillaries are so plentifully distributed. This same kind of absorption, I presume, removes the serum as it is extricated from the clot, thus leaving the *post mortem* red clot free of serum.

(b.) There is another condition of blood found after death, in which perfect fluidity of blood is maintained. This fluidity—which, by the way, is very rare—is met with in two classes of cases. In some instances, from chemical changes going on during life, the coagulability of the fibrine is destroyed. In cases of typhus—I mean true petechial typhus—this condition has been observed; it has also been seen in scurvy, yellow fever, and in examples where water has been largely introduced into the circulation in the lower animals. The fixed alkalies carried on to a poisonous result, will cause the same fact. Cyanide of potassium and antimony lead to a like phenomenon. If blood thus obtained be set aside, it will not coagulate, although placed in conditions the most favourable to coagulation. In another class of cases, the blood may be found fluid in the heart, not because the coagulating process is destroyed, but because the conditions favourable to coagulation are not presented. The law on this point seems to be this. If in any given case the life of a person is suddenly extinguished while yet the blood is in a state of perfect fluidity in the vessels, and if in the cause which produced death no portion of the closed circuit of the vascular system is opened, and if the vessels are themselves filled with blood, then the volatile alkaline solvent by which the blood has been held fluid is retained, and the blood remains fluid until it is exposed to the air. On such exposure, however, coagulation takes place; but, as the temperature of the blood falls after death to the temperature of its surrounding medium, the coagulation will be slow, as compared with that of warm blood drawn from a living man. The period required for coagulation, in short, will be the same as it would be in a mass of newly drawn blood suddenly reduced in temperature from 98° to the temperature of the dead. This condition of fluid blood after death is met with in instances where the death has suddenly occurred from shock, from chloroform syncope, from hanging and other varieties of asphyxia, and the like.

(c.) The third class of cases embraces those in which the blood is found in the heart with the fibrine separated; and as these are the cases of most interest to us at this time, I may leave the others without further note, in order patiently to trace out, and as nearly as possible in the order described, the following points.

- I. The various forms of concretion in the heart, and the modes by which they are produced.
- II. The conditions of disease under which concretions are produced, and the periods in the course of a disease at which they occur.
- III. The symptoms indicating fibrinous deposition, and the point at which the deposition has taken place.
- IV. The value of a knowledge of the subject of fibrinous deposition, in the practical treatment of disease.

I.—FORMS OF FIBRINOUS SEPARATION.

The simplest kind of separation is described well in the accompanying sketch (Fig. 1). The fibrine in this case lies on the superior surface of a red coagulum. It forms, in

Fig. 1.—Deposition of Fibrine on the surface of a Coagulum.

this way, a thin layer, shaped to the clot beneath. It is ordinarily convex above, where it comes into contact with the wall of the cavity; and concave beneath, where it is in contact with the blood. If the clot be turned over, so that the fibrine surface rest on the table and the red blood-clot look upwards, the red portion may be gently washed away by the stream from a wash-bottle, and the layer of fibrine may be left entirely separated. It will then be found to consist of a simple layer of white matter, varying in thickness from one to four lines, firm rather in character, and of a very pure white.

This form of clot may be met with in any of the cavities of the heart, or in the great vessels. If the heart is examined *in situ*, and the cavities are cut into from above, the fibrinous layer will meet the eye as soon as the cavities are laid open. The fibrine is separated, in short, from the under stratum of blood, the body lying on the back at the time of the separation. This form of concretion, though it may occur, as I have said, in any part of the heart, is most common in the auricles. Occurring in the pulmonary artery or aorta, the separation takes the form of a part of the circumference of a cylinder; the superior surface being convex, the inferior concave—modeled, that is to say, to an under column of red blood. I ask special attention to this first form of fibrinous deposition, whether it occur in one of the cavities of the heart, or in one of the large vessels. I should prefer to designate it, for clearness sake, as the *static* deposit, because it is formed from blood at perfect rest.

A second variety of fibrinous separation in the heart is that of a firm white striated mass, filling a cavity or a tube. In some instances, especially where the concretion exists in the auricle, and when it occurs in the course of an acute inflammatory disease, it may fill the cavity altogether, and even distend it. In other cases, although it may form the greater part of the matter contained in the cavity, and although it may itself be purely separated, it may be surrounded by a layer of red blood. This layer will not be found only beneath the concretion, but, as I say, surrounding it; this form of concretion is thus entirely distinct from that described under the first head. When concretions so formed lie in a vessel, as the pulmonary artery, they may extend very far into the ramifications of the vessel. Where they end as separations of fibrine, they are, as a general rule, tipped at their extremities by a layer of red blood, which may be washed off, leaving behind a fine pointed

Fig. 2.—Concretion in the Auricle, marked by the Musculi Pectinati.

conical termination of fibrine. The concretion occurring in the manner thus described, is often beautifully modeled to the part in which it lies. If it lie in the auricle, it will be found with its surface marked by the little musculi pectinati, as shown at c in the accompanying drawing (Fig. 2), taken from a recent specimen; or if it pass into the pulmonary artery or aorta, it will be found bearing the impress of the semilunar valves at the point where it traverses them, in the way marked in Figure 3, where a

Fig. 3.—Fibrinous Concretion filling the Auricle, extending into the Ventricle and Pulmonary Artery, and marked by the Semilunar Valves.

concretion (c) filling the right auricle, partly filling the ventricle, and passing into the pulmonary artery, is marked over the line of the semilunar valves with a distinct depression, cup-shaped, and originally an exact print of one of the semilunar curtains.

There is another form of deposition in which the surface is grooved more or less deeply. The groove thus exhibited may be simply curved, or spiral. The line of the groove, whatever that may be, indicates the course of what was once a column

Fig. 4.—A. Fibrinous Deposit with simply curved groove; B. Concretion with spiral groove.

of moving blood; and, indeed, a portion of red blood will in most cases be found in the groove. The simply curved grooves are most frequently seen in concretions formed in the

right auricle. Here the superior groove, running nearly straight (see A, Fig. 4), marks out a current of blood which, whilst life still existed, found its way from the superior vena cava through the auricular cavity into the auricle, and over the surface of the concretion. The inferior groove, on the other hand, very sharply curved, indents the under surface of the concretion, and takes the direction of the column of blood, which during life passed from the inferior cava through the auricular cavity into the ventricle. The straight and curved grooves of a concretion laid down in the right auricle are in almost every case presented as above. But there is one rare modification; I have seen it at most but twice, in which the concretion is divided into two distinct halves, one half lying in the upper part of the auricle, the other in the lower part, the streams of blood from the two cavæ separating the two fibrinous masses, and grooving them both, in the direction of the venous currents. In these examples, the concretions, superior and inferior, have a firm attachment to the auricular wall.

The spiral groove, whenever it is met with, is found in concretions which extend into the large vessels, as into the pulmonary artery on the right, or the aorta on the left side. This spiral groove I observed and pointed out at the Medical Society of London so far back as the year 1851. I have met with it frequently since that time; and in B, Figure 4, above given, it is excellently shown from a fresh concretion. The groove thus formed is caused by a current of blood, which during life has made its way from the heart by a winding course around the fibrine cylinder.

There is another form of deposition, in which the centre of a concretion is bored by a column of red blood. Here the concretion takes the form of a hollow cylinder. (Fig. 5, c.) This modification is rare; and when it occurs, it is found in the commencement of one of the two large trunks, the pulmonary artery or aorta. I have met with it very clearly marked, but chiefly in the aorta. It is worthy of note, too, that in examples yielding tubular concretion, the containing vessel is generally dilated, and roughened on the inner surface from atheromatous deposit. From the rarity of this form of concretion, I infer that a dilated or roughened tube is favourable as a base-work for the deposit. When thus formed, the fibrine is firmly adherent by its circumference to the inner surface of the artery; and the thickness of the fibrine cylinder is due to a series of layers, laid down from the circumference towards the centre. The diameter of the column of red blood in the centre, in all the instances I have seen, has been about that of a goose-quill. The red blood thus situated is in the coagulated state.

This form of concretion gave rise to the myth held by the old writers, that serpents might exist, and were, in fact, to be sometimes found, in the great blood-vessels. In the Library of the Medical Society, there is a quaint paper by one of our old London Æsculapians, giving a serious account of a serpent which he had removed from the great aorta of a patient who died under his care. That which shocked our historian most was the observation that the creature had an alimentary canal and a distinct anal orifice. He gives even a drawing of the creature, specially indicating the termination of the alimentary tube. The drawing, as we read it in these days, is a very correct representation of a hollow fibrinous tube, with a cord of red blood running through the centre.

In one or two instances, I have met with a concretion having conical points, in which, on vertical section, I found a thin cord or film of red coloured substance running centrally and in the line of the concretion. I therefore thought that the tubular character of many concretions might be hidden in some instances by a contraction taking place at the two ends of the concretion. I now believe, however, that this opinion requires to be withdrawn; and herewith I withdraw it. In the annexed drawing, No. 5, I have supplied, from nature, a beautiful illustration of the character of the true tubular concretion. In the case from which the sketch was made, the concretion (c) was laid down in the aorta, that vessel being dilated at its commencement, and having its inner surface much roughened. The concretion, some days in formation, was at last loosened by the force of the ventricular contraction acting on a tube, becoming smaller and smaller in its diameter: suddenly carried away altogether into the narrower part of the artery, it produced almost instantaneous death.

There is yet another form of deposition of the hollow character, in which the fibrine is laid down in the cavities of the heart in such a way as to encircle the inner surface of the cavity, and, by illustration, to cause a new and false endocardial lining. I have attempted to indicate this mode of deposition also in Fig. 5, at points A, B. In these instances, as I have once

seen, the deposit may entirely cover the inner surface of an auricle, may be perforated by the entering vessels, and may contain enclosed in it a clot of red coagulum. In other examples, much more frequent in number, the ventricular cavity is found lined in patches (Figure 5, b) with an extremely fine web of fibrine, so thin as to be transparent, and

Fig. 5.—Tubular Concretion in the Aorta.

easily looked over if sought for hastily, but easily to be seen and raised with the forceps, if sought for with precision and care.

Lastly, it is to be observed that fibrinous concretions have some point or points of adhesion to the walls of the part in which they are laid down. The adhesions are of two kinds—(a) mechanical, (b) organic.

a. The mechanical adhesions are produced by an interlacing of the fibrine with the muscular fibres of the heart, or with the tendinous cords extending, in the ventricles, from the columns to the valves. These adhesions are most firm in the auricles, and particularly in the right auricle, where they interlace so intimately with the muscoli pectinati that considerable force is often required to separate them. The concretion, indeed, if force be used, will tear off at its base, but will not unwind itself from the muscular fibres. The auricle of the auricle is a spot in which this kind of adhesion is very strongly brought out; but I have seen, also, a very firm attachment in the right ventricle, the base of the fibrine mass being closely interwoven with the muscular structure. It would seem, too, that an adhesion thus existent may last for many months, nay, for years, without any organic connection being produced. My friend Dr. Sayer was so kind as to show me on one occasion a concretion removed from the body of a lady, who for some years had suffered, at intervals, with the symptoms of obstruction of the right side of the heart. She died at last suddenly, in one of these attacks; and, after death, the concretion I refer to was found in the right ventricle, and extending into the pulmonary artery. It could not be separated from its attachment to the ventricle except by being torn across; it was unusually firm in consistence, and had all the characters of a concretion long present in the heart; but there was no evidence of the mass having undergone organisation.

b. The organic adhesion of a concretion to the walls of the heart, or to the valvular appendages, is, in very rare examples, fully marked. In the drawing (Fig. 6) there is presented an illustration of this nature. Here the concretion assumed a globular shape; it was attached by a small pedicle to the posterior curtain of the mitral valve; on dissecting it down, I found that a small blood-vessel passed through the pedicle, and, indeed, there was a distribution of vessels throughout the whole mass. The patient from whom this was removed was an aged woman, who had long suffered from signs of cardiac disease, indicating obstruction on the left side of the heart. She died

suddenly, from the fibrinous mass having been carried forcibly upwards into the infundibulum, and from the arrest in the arterial circulation necessarily resulting from so great an obstruction.

Fig. 6.—Organic Adhesion of a Fibrinous Concretion to the Heart.
A. Portion of Aortic Valves; B. Mitral Valve; C. Concretion.

Such, then, are the broad anatomical characters of the fibrinous deposits met with in the heart and great vessels adjoining the heart. I called the first of these varieties a static formation, because it is produced from blood at rest. The remainder, one and all, differ from the static product in that they are the result of a dynamic force; that is to say, they are formed from blood in motion.*

[To be continued.]

* I am indebted to the artistic skill of Mr. Orrin Smith for the excellent woodcuts (except the last) by which the above remarks are illustrated.

Original Communications.

REMARKS ON ACUTE MANIA.

By FREDERICK NEEDHAM, Esq., Superintendent of the Lunatic Hospital, York.

Of all the varied forms of mental disorder which claim the attention of the practical psychologist, none is so extensively diffused as mania, and none consequently so frequently requires the exercise of the medical art. Moreover, no variety of mania is in the same degree amenable to judicious treatment with the acute form, the subspecies of which, with their treatment, form the subject of this paper.

I do not purpose here giving any very minute description of the symptoms of acute mania, other than those which especially illustrate the object I have in view; neither shall I offer any opinion respecting the class of mental faculties which is chiefly and primarily affected by it. I shall simply describe certain heads, with the symptoms peculiar to each, under which I believe all cases of acute mania may be satisfactorily and clearly arranged, and urge certain principles of treatment—modified, of course, according to the peculiarities of individual cases—which I have found to be most successful in arresting the progress of disease, and restoring mental health.

Acute mania, I think, naturally divides itself into three varieties:—1, sthenic; 2, asthenic; and 3, what I would term subacute persistent.

I. *Acute Sthenic Mania*, which invariably occurs in strong, healthy, and robust persons, with considerable vital power and a vigorous circulatory system, commences, as in all the varieties, in many different ways—by irregularities in the affections, by gloom and despondency, or even occasionally by long con-

tinued stupor, combined with sleeplessness, depraved secretions, and sometimes febrile disturbance. These symptoms continue, one or all of them, for an indefinite period, and are succeeded by the fully developed disease, which exhibits, according to the temperament or other condition of the case, many different phases. There will be one or all of the following:—great incoherence of ideas and in conversation; violent excitement in manner and gesture; loud, obscene, and disgusting language; total disregard of decency and cleanliness; and numerous ridiculous hallucinations or illusions. The case will possess, too, the physical symptoms of sthenic excitement; heat of head, and of the surface generally; flushed face; injected conjunctiva; frequently, though not always, contracted pupils; a foul and red, but *not* dry tongue; constipated bowels; scanty and high coloured urine, which affords a copious deposit; together with a full, bounding, and generally frequent pulse—frequent, often irrespective of the muscular exertion which is being used by the patient. In this condition, depletion is evidently needed to lower the circulation and moderate the excitement; but bleeding is, with the very rarest exceptions, utterly inadmissible. I do not here wish to be understood as referring to the local abstraction of blood by leeches; indeed, the adoption of this measure is frequently attended by the happiest results.

If bleeding be out of the question, what are we to do? The hot bath will equalise the circulation, but it frequently fails in reducing the violence of the maniacal symptoms, and is not unattended by danger of sudden and fatal syncope. The remedy upon which I chiefly rely, and from which, judiciously used, I have seen the greatest amount of benefit derived, is tartarised antimony—a drug which has, I think, fallen undeservedly into disrepute, from the class of cases in which it should be used not being clearly defined. It seems to answer only in those cases where you have the full pulse and injected conjunctiva, and other signs of sthenic excitement; where, in fact, you not only have excessive nervous action, but increased nervous power also. My plan in its administration is to give at first a brisk purgative, consisting of three grains of calomel and a drop of croton oil, and to follow this by a grain of tartar emetic in an ounce of water, repeated every three hours, until the bowels are affected; the dose being increased, if the patient be tolerant of it. I have given eight or ten grains without the slightest apparent effect being produced by the remedy, other than the abatement of the excitement. The object in its use is not to produce nausea or sickness, for when these occur early in its administration, I should expect but little benefit from it; as Dr. Bucknill observes, in the admirable work on psychology, written by himself and Dr. Tuke: “The benefit to be derived from it appears to bear a close relation to the tolerance which the patient has for it.” My great aim in its administration is to procure a free and copious action of the bowels. Here, I am aware, I differ from many who use the medicine; but I have, with no exception, found that marked benefit has resulted only in those cases where this effect has been produced. A gentle action should be kept up by gradually diminished doses of the drug; and after the bowels have copiously answered a few times, a full opiate at bed-time, from fifty minims to one fluidrachm of the tincture of opium, will generally have the happiest results in procuring sleep and allaying cerebral irritability. Of course, in the subsequent management of the case, such modification in the treatment will be demanded as seems to be requisite.

II. *Acute Asthenic Mania*. The second variety differs essentially from that which has just been under consideration, although possessing many of the same general symptoms. Here the type is diametrically opposite, and the treatment consequently is far different.

As regards the mental symptoms, there is little change. It is chiefly in the physical signs that the distinction consists.

The incoherence in conversation and in ideas evidently exists as strongly in the one variety as in the other; there are the same violent excitement, and the same delusive fancies, but these are combined here with a feeble condition of the physical system, and deficient nervous power.

In place of the hot head and flushed face, we have, commonly, a cold, clammy surface, and some degree of pallor. In lieu of the injected conjunctiva and contracted pupils, we find a conjunctiva pale and exsanguine, and frequently dilated pupils.

The tongue, which in the former variety was red and moist, is here pale, flabby, and not unfrequently brown and dry. The bowels are often relaxed, and the urine pale and in fair quantity, whilst the pulse, so far from being full and bounding,