

ETIOLOGY OF PERICARDITIS.

BY JAMES T. WHITTAKER, M.D., OF CINCINNATI.

[Read in the Section of Practice of Medicine and Materia Medica of the American Medical Association. May, 1884.]

Pericarditis is a disease of greater frequency than is generally believed. The statement made by the author of this paper in the Cincinnati Academy of Medicine that pericarditis is ordinarily oftener overlooked than recognized, having been denied by several members, was strikingly confirmed by an ex-interne of one of our largest hospitals, who observed that of the five cases which had occurred in his service, the diagnosis was made in *intra vitam* in no single case. The existence of the disease in every case was made apparent only on the post-mortem table. Maurice Letulle, *Gaz. Med. de Paris*, 22-50, 1879-80, remarks that of all acute or chronic diseases, pericarditis oftenest runs a latent course.

The failure to recognize pericarditis depends upon the fact that so few of the symptoms of the disease are local. It is only in the face of effusion, and mostly of some magnitude, that signs pertaining to the heart are manifest.

Then if we sum up all the possible causes of pericarditis we observe that in most cases the disease is independent of rheumatism. Rheumatism remains of course the most frequent of any one cause of pericarditis, largely because of the frequency of rheumatism. Rheumatism is the most frequent of a great group of diseases produced by micro-organisms. Any disease produced by micro-organisms may be attended by pericarditis.

Medical teachers and clinicians so often emphasize the fact that pericarditis is a sequel to rheumatism that in the absence of rheumatism the existence of pericarditis is not even suspected. The failure to recognize pericarditis depends largely upon the fact that the existence of the disease is not suspected. For when the suspicions of the practitioner are aroused the diagnosis is generally easy. A striking illustration of this fact I saw in a case that occurred in my practice a few months ago. The patient had been the victim of unsuspected pericarditis, with effusion, for fifteen years, at least the same symptoms had been present in greater or less degree all that time. The prominent symptoms were pallor, dyspnoea, such vertigo as to compel the recumbent position, occasional cough and a pulse so feeble as to fade away when the arm was held at right angles to the body.

Digitalis and alcohol administered from time to time obviated imminent collapse. There was undoubted increase of dullness over the region of the heart which had been taken for dilatation. By aspiration one pound of serum, at first clear, later brownish and flocculent, was withdrawn from the pericardium. The symptoms of immediate danger soon disappeared. But the long pressure and maceration had weakened the walls of the heart to such an extent as to prevent perfect recovery. This was my third case of long continued unsuspected pericarditis with effusion. In

every instance inquiry had been made as to the previous existence of rheumatism, and in the absence of it no further attention had been given to the heart. It is not safe to exclude pericarditis in the absence of preëxistent rheumatism, first because pericarditis arises in consequence of so many other conditions, and second because the pericardium may be in rheumatism the first and only joint (so-called) affected.

The frequency of occurrence of pericarditis is best shown by statistics from hospital practice where accurate records are kept and full autopsies are held in all fatal cases. The latest statistics in easy reach are from the general hospital in Vienna. According to the report for 1880, there were treated during the year 23,249 cases of disease of all kinds. Of this number 551, about one-fortieth of the whole number, were cases of rheumatism. However, but 390, about one-sixtieth, were cases of rheumatism of the joints. Pericarditis occurred 32 times, or once in every 726 cases of disease of all kinds. The point of especial interest is the fact that the pericarditis was a sequel or consequence of rheumatism in but six cases, while in 26 cases, that is five times as often, the disease depended upon other causes. Endocarditis, it may be mentioned in passing, occurred but 15 times. Pericarditis was therefore in that year twice as frequent as endocarditis. This ratio may have been an accident, or it may be that endocarditis only seems more frequent, because it leaves valvular lesions. Patients recover or die of pericarditis quickly, as a rule. Cases do not accumulate as in endocarditis.

The older statistics based simply upon clinical observation speak for the greater frequency of endocarditis. Thus Sibson's record shows three times as many cases of endocarditis. But clinical observations can give no precise information regarding the frequency of pericarditis for the very reason that the disease, so often latent, is overlooked.

Exact information in this respect can come only from the dead room. Duchek claims to have found evidences of pericarditis 89 times in 590 post-mortem examinations, that is in a fraction over 15 per cent. of all the autopsies made, and while this ratio must be regarded as an overestimate, for the reason that Duchek included in his diagnosis the cases of so-called milk spots, which are now no longer regarded as pericarditis in the true sense of the term, yet making allowance for the tendinous spots which are especially frequent in ages when true pericarditis is especially infrequent, it is seen that pericarditis is a comparatively frequent disease. Perhaps the statement of Willigk that pericarditis is encountered in 4 per cent. of autopsies is nearer the truth in that this statement is based upon observations made during the earlier periods of life. The relative frequency of pericarditis is dwelt upon, for the reasons, first, that it makes a great difference in prognosis and treatment whether the outside or inside of the heart is affected, and second, because we diagnosticate diseases in the order of frequency. Later observations only serve to confirm the statement of Bauer to the effect that "formerly and up to the close of the last century, pericarditis was considered a rare disease; since then,

it has been proved to be of quite frequent occurrence."

It is universally conceded that pericarditis occurs oftener among males than females. Of the 32 cases cited from the Vienna hospital, 23 were males. Louis says of his 106 cases that only one-fourth were females, a ratio which agrees with the observations of Hache. Bamberger's ratio was 38 males, 25 females. Sibson, who saw the largest proportion of females of any author, observed, nevertheless, the preponderance of males; of his 63 cases 35 were males, 28 females. This ratio points to the greater liability of males to the diseases which cause pericarditis.

Excluding the cases of so-called tendinous spots, which are now regarded as simple friction scleroses or hyperplasiæ of senescence, it is as generally admitted that pericarditis is a disease of youth and maturity. Grisolle and Bamberger unite in the statement that the maximum frequency of the disease occurs between the ages of 20 and 30. The appearance of the disease at any period of advanced life is, of course, not excluded by this statement, and emphasis should be put upon the fact that undoubted cases of pericarditis have been observed in foetal life; yet the period of occurrence of maximum frequency points unmistakably to the class of diseases most responsible for pericarditis, viz.: the acute infectious diseases.

Just here it may be mentioned that pericarditis occurs in all lands and climes. Hirsch quotes from Morehead the remark "Complicating pericarditis or endocarditis is, I believe, as common in one country as another. Epidemics of pericarditis are cited by Friedreich from Trécomb (1755) in the siege of Rocroy; by Hubert (1814) in the siege of a garrisoned fort, in connection, Friedreich thinks, with pleuropneumonia; and by Lalor in connection with an epidemic of febris continua in Kilkenny in 1848-49. The epidemics of hæmorrhagic pericarditis observed by Seidlitz, Kyber, Himmelstein and others, along the Russian coast, and among the marines, at Moscow, Sebastopol, etc., clearly arose from scurvy.

The relation of occupation to pericarditis has been best shown by Sibson, who observes that "servants formed fully two-thirds of the whole of the female patients affected with pericarditis." Girls engaged in the hard labor of a servant at work, at a tender age, from morning to night, when attacked with rheumatism, to which they are so subject, are all but certain to have inflammation of the heart without or within. They are growing, he says, their frame is not yet knit, they are sensitive to cold and wet, and they are subject to palpitation. It is interesting to note of Sibson's cases that pericarditis occurred in none of his females of sedentary occupation, needlewomen, etc. The influence of hard work is still further proven in the analysis of his male cases. "*Ubi stimulus ibi affluxus*."

Pericarditis is described in the books as being primary and secondary in its nature, and much confusion exists as to what is meant by primary pericarditis. If by primary is meant a spontaneous or autochthonous inflammation, the term should be discarded altogether, for it may be said that pericarditis never

arises in this way. Pericarditis is, strictly speaking, always a secondary or deuteropathic malady. There are met, it is true, occasional cases where the cause has not been or cannot be discovered, and these cases might better be labelled inexplicable than primary. All modern writers agree as to the great rarity of so-called primary pericarditis. Duchek saw only one case in 89, Bamberger but 4 in 63. Friedreich with his wide experience, met but two cases in which he could discover no cause for the disease. Since the field of catching cold is being daily more and more contracted in the etiology of disease, it is wiser to be agnostic regarding inexplicable cases than to appeal to doctrines incapable of demonstration and hence bound to become obsolete.

An etiological division of cases more in accord with existing knowledge would be into consecutive (or mechanical) and infectious (or mycotic). Under the head of consecutive origin would fall the cases of insult or injury to the pericardium from without, as by traumatis, by perforation from a gastric ulcer, from the œsophagus, from an abscess of the spleen, from pulmonary and pleuritic processes, echinococci, aneurisms, caries of the vertabræ, sternum and ribs, mediastinal affections, inflammations of the mammæ, skin diseases—in short, all involvements of the pericardium by contiguity or continuity of structure, including under this head also extensions of inflammation from the heart itself.

While these cases of so-called mechanical origin form a respectable contingent of all the cases, they nevertheless remain in the minority, all combined, when compared with the inflammations or processes secondary to the infectious diseases. As these mechanical causes of the disease are for the most part apparent, or may be discovered by careful search, and as the pericarditis in these cases is only an accident, so to speak, in the history of the original malady, they may be properly relegated to chapters on the possible complications of the various maladies.

Pericarditis proper belongs as a link in the chain of the acute infections. Probably the time is not far distant when separate forms of the disease will be recognized as dependent upon different etiological factors. Just as we now recognize as very different affections, the inflammation of the lungs produced by a trauma, by an embolus, an abscess, a catarrhal process, etc., from a true croupous pneumonia, we may come to consider as a separate affection the pericarditis which develops in the course of the infections in consequence of the immigration into its structure of micro-organisms.

There are special reasons why these micro-organisms come to be deposited by preference in the serous membranes and by especial preference in the pericardium. In the first place, the circulation in these structures is very sluggish, is stagnant at times, and just as uric acid in gout comes to be deposited guttatim in the big-toe joint, over the knuckles, in the lobule of the ear, etc., places where the circulation of the blood is slowest, border lines of the circulation, as it were, so micro-organisms come to be colonized in the serous membranes. In the second place, the lymph vessels are so exceedingly abundant in all serous membranes

as to make of them veritable lymph sacs, whose delicate canalicular walls offer no obstacle to the rapid egress of migratory blood corpuscles, to say nothing of the infinitely more minute, and in some cases, more actively moving micro-organisms.

Whatever the explanation, the fact remains as long ago observed that all the infectious diseases are liable to be complicated by pericarditis. In former times it was the habit to refer this complication to differences in the chemical admixture of the blood, or to ferments in the blood. In our day the affections of the serous membranes are explained by the presence of schyzomycetes.

It is well known that the pericardium is not alike affected by all infections. Certain forms of them show distinct predilection for this structure, and so notoriously is this true of acute polyarticular arthritis, that it is, as has been stated, the habit of many practitioners to exclude pericarditis in its absence. It is undoubtedly true that acute joint rheumatism remains the most prominent factor in the etiology of pericarditis, that it causes, or better, is attended with more cases than any other one factor; Bamberger claims that 30 per cent., Chambers and Thompson 16 and 20 per cent. of cases arise from rheumatism; but it is equally true that there is no other acute infection which may not be followed by pericarditis.

If pericarditis is to occur in rheumatism, it shows itself by preference between the fourth and fourteenth days of the disease. While it is always a possibility in mild, brief or protracted cases, the rheumatism marked by severity or fugacity are rather more liable to entail pericarditis. But it is the youth of the patient that is of all the most inviting or predisposing element. The young of all animals show much greater susceptibility than the old to all the mycoses.

It is not the intention to underestimate the role of rheumatism in the production of pericarditis, but to show cause for it, and more especially to emphasize the fact that almost any of the acute infections may act in the same way.

Next in frequency to acute joint rheumatism in the pathogeny of pericarditis comes pleurisy. Morgagni and Corvisart remarked this complication in their day. Duchek claims to have seen in 43 cases of fresh pericarditis an associate pleurisy 22 times; but inasmuch as the freshness or age of the pleurisy is not remarked, it is fair to infer that the order of sequence, in some of the cases at least, may have been reversed. In Bamberger's cases of pericarditis, 10.5 per cent. arose from pleurisy and pneumonia.

Tuberculosis affects the pericardium in both ways. That is the process may by contiguity inflame or a vomica open up the pericardium to produce the disease in a mechanical way. Or the micro-organisms of tuberculosis may lodge and multiply upon the serous surface, just as upon the cerebral meninges or tunica vaginalis, as conveyed thither in the lymph and blood supply. Bamberger's statistics show pericarditis in 14 per cent. of cases of pulmonary phthisis, but it is impossible to eliminate the role of pleurisy in any of these cases.

I can find no statistics declaring the relative fre-

quency of pericarditis in the various acute infections, although it is stated in the history of nearly all of them that this complication does occur.

In pyæmia and septicæmia as typically represented in traumata and puerperal fever (so-called), pericarditis with its frequent associate endocarditis is the complication which directly or indirectly is the most frequent immediate cause of death. It occurs in all three forms of typhus, the exanthematic, recurrent, but most rarely in the abdominal form. Measles, scarlet fever and small-pox are attended with pericarditis occasionally only in the less severe, as a rule in the malignant form of these diseases. It is not very rare in cholera, and is quite common in epidemic dysentery along with or independent of the rheumatism which sometimes follows dysentery. In erysipelas, diphtheria, cerebro-spinal meningitis, pericarditis not infrequently constitutes the last link of the disease process. These are all diseases in which there is already either positive or strong presumptive evidence of mycotic origin.

But pericarditis may ensue upon even the lightest infections. Perhaps one of the most interesting statements that could be made in illustration of this fact is that of Bednar, who several times observed pericarditis supervene after vaccination. In one case an acute dermatitis developed in 24 hours after vaccination with a simultaneous pericarditis. In a second case, a sharp diarrhœa, subcutaneous abscesses and pericarditis proved the order of sequence. In a third case the pericarditis developed on the thirteenth day after vaccination without intervening disease.

In Bednar's 36 cases of pericarditis the disease was found independent of other demonstrable lesions only four times. Thirty of these cases occurred within the first month of life, four in the second, and one in the third and fourth months. In all cases the disease was attributable to puerperal processes in the mother which, in the author's words, "extended their injurious effects to the child, and in consequence of acute decomposition of the blood developed fibrinous or purulent exudations in various organs, and frequently in the pericardium. The disease proved fatal, as a rule, within the first 16 days of life."

Since the investigations of Klebs and Koester have shown of endocarditis that the mild, so-called acute or later verrucose forms, as well as the malignant or ulcerative forms, are of mycotic origin; that the difference is in degree, not in kind, and that micro-organisms can be demonstrated even though no source of immigration can be discovered, the nature of endocarditis seems well understood.

Endocarditis and pericarditis are very frequently found associate. The older clinicians speak of endo-pericarditis just as they speak of pleuro-pneumonia. It is therefore safe to infer, so far as it is safe to infer anything, that pericarditis, independent of the consecutive cases, is part of a general mycosis. The prophylaxis and treatment of the disease based upon what is known of its etiology, that is the rational or scientific treatment, calls for the antimycotics, cold and rest.