

same individual, without fracture, by a steel-armored bullet from a new Mauser. Taking all these facts in consideration I believe it may be stated without much fear of contradiction that the gun-shot injuries of the extremities, which have formed such a large percentage of the wounded, will be less severe in the wars of the future, and that the proportion of men in this class who will require transportation to the rear will be less than heretofore, and that, therefore, an increase in the number of porters from this source need not be apprehended.

Our present knowledge of treating wounds will operate materially to lessen the burden of the relief corps. In former wars sepsis was the rule in all wounds; the constant attention and frequent dressings entailed a vast amount of work on the medical department of the various hospitals. To-day by observing aseptic and antiseptic methods, it is the exception to witness suppuration in wounds; it is seldom that a wound requires to be dressed oftener than once per week; whereas it was necessary in the pre-aseptic era to change the dressings daily, and often twice per day. The saving in time, material and labor is at once apparent when we contrast the old methods with the new.

Original Articles.

ARTERIO-SCLEROSIS,

WITH REPORT OF A CASE OF THROMBOSIS OF THE BASILAR AND CORONARY ARTERIES.¹

BY W. H. PRESCOTT, M.D.

ARTERIO-SCLEROSIS is a disease of the arteries, characterized by a thickening of their walls (which is due to a deposit in the intima) with a diminution in the size of the lumen. There are three divisions into which the disease may be separated: first, the nodular—arterio sclerosis nodosa—in which the disease is circumscribed, although it may be widely distributed; second, the senile, in which the change in the arteries is one of the signs of advancing years; and, third, general arterio-sclerosis, a disease of the middle-aged (or young), and which is the form to which reference is made when the disease is mentioned.

Thoma found in the fetus that there was a marked increase of the connective tissue in the intima of the aorta between the opening of the ductus arteriosus and the bifurcation, the increase taking place after the closure of the umbilical arteries. He claims this is due to the fact that the aorta is dilated after the closure of the umbilical arteries, and as a result of the accompanying irritation of the nerves of the aortic walls, an increase of the connective tissue in the intima is brought about. This increase of the connective tissue in the intima causes a diminution in the size of the lumen, and thus a return to the normal. The same increase of connective tissue is said to happen in the main artery supplying an extremity, when for any reason the extremity has been amputated.

In arterio-sclerosis there is a disease of the media (with a destruction of its cells) which allows a dilatation of the vessel—this dilatation being followed by a deposit of (or increase in the) connective tissue in the

intima, thus bringing the lumen of the vessel nearly to its normal size. This thickened intima may become degenerated and an "atheromatous plaque" result. After death this plaque appears as a slightly elevated patch of varying size and usually yellowish in color; but in life there is a depression (due to the blood pressure) corresponding to the degenerated area. This degenerated area may be partially destroyed, or washed away, and a loss of substance result—the so-called atheromatous "ulcer." A thrombus may be formed at this point, or the wall give way and an aneurism be the result.

Etiology.—Many things have been said to contribute to the destruction of the media: hard work combined with worry, chronic alcoholism, lead-poisoning, gout, syphilis, articular rheumatism, endocarditis, typhoid fever and scarlatina. In several cases which I have seen none of these could be held to be the cause, but another infectious disease, namely, influenza, might be. Dr. J. Homer Wright tells me he once heard Dr. Osler say, "arterio-sclerosis—the result of worshipping at the shrine of Vulcan, Saturn, Bacchus or Venus."

The symptoms depend a good deal upon the part most affected; an arcus senilis is common, and the arteries of the extremities may be quite rigid. "Edema and ascites are rare, except possibly just before death" (Councilman). When the arteries of the brain are affected there may be persistent headache, vertigo, loss of consciousness, hemiplegia, and other forms of paralysis. The latter symptoms are due to thrombosis, hemorrhage, embolism or spasm (?) of the arteries. Embolism is rare, and is secondary to some change in the heart or its valves. Hemorrhage may result from the rupture of a small aneurism. Spasm of the arteries is a theoretical cause, but may explain the numerous attacks of what may be called transient paralyses, with complete recovery in the intervals. When the coronary arteries are affected there is usually an irregularity in the strength and rhythm of the heart's action with the symptoms ascribed to a fatty heart or to interstitial myocarditis, or there may be attacks of angina in which the pulse-rate may differ on the two sides (arterial spasms?). Rupture of the heart wall may occur with hemorrhage into the pericardium, or a dissecting aneurism be the outcome; in these last two cases the only symptom may be sudden and severe pain in the epigastrium, with death as a result immediately, in a few hours or days. When the arteries of the kidney are affected there is a slight trace of albumin in the urine, with an occasional cast; but in those cases which I have seen where the urine was carefully examined, there has not enough abnormal been found to warrant a positive diagnosis of renal disease (the amount of urine is about normal or small). Of course, there may be advanced renal disease accompanying (or due to) the arterio-sclerosis; and in these cases the chemical examination would show the disease which is present. In arterio-sclerosis there is some increase of connective tissue in the kidney (which may be focal), and there are some depressions in its surface. The heart is usually enlarged in some cases to a great degree without any evidence of valvular disease. Dr. Councilman reports two cases where the heart weighed 800 and 850 grammes respectively. The absence of hypertrophy does not rule out the disease.

I believe many cases of indigestion are due to changes in the stomach and intestines, the result of this disease.

The treatment has hitherto been very unsatisfactory,

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and purely symptomatic combined with strict attention to diet.

All causes of worry should be removed, and no hard work allowed.

The subcutaneous injection of sterilized solutions of glycono-phosphate of soda, as in the case I am about to report, has been followed by considerable improvement, and its success would warrant a further trial of it.

The method of administering is simple. One to two cubic centimetres of a sterilized solution of glyconate phosphate of soda, each cubic centimetre containing twenty cubic grammes of the salt are injected daily into either gluteal region behind the great trochanters. Absolute asepsis is requisite. This method was first suggested by Dr. Albert Robin in *Le Bulletin Médicale*, April 25, 1894.

C. H. C., sixty-one, male, born in Massachusetts. Family history good. No venereal history. At seventeen was thought to be "in a decline" and went West; from that time until five years before his death was very well. At this time had influenza. Two years after that he was irritable; this lasted a year. Fourteen months before he died, while in Spain, he became dizzy, staggered, and was not able to look up. This lasted only a short time. Another similar attack next day; kept pretty quiet for a week, then went to Paris and London. From London he went to Germany, where he "caught cold" and felt weak. Came to Boston. Examination of urine was negative. Heart thought to be fatty; and he was advised to give up smoking. Diagnosis of arterio-sclerosis made at this time. Improved very much; and when he went abroad a few months later, looked bright and felt as well as he ever did. Reached Cairo about December, and while there had another dizzy spell, and was advised to diet.

On January 26, 1896, while up the Nile, had an attack of hemiplegia, with difficulty in his speech. Was taken to Cairo, where he had another attack; this time paraplegia, although there was no trouble with bladder or rectum. He reached Paris in April, and improved very much under the subcutaneous injections of a sterile solution of phosphate of soda in glycerine. His speech was thick all this time. In the latter part of May he had another "shock," but soon rallied, and made the journey home without trouble or incident.

I met him in New York May 30th. He was then able to walk pretty well, could follow conversation fairly, and possessed a good appetite. There seemed to be no paralysis, but marked weakness. The speech was a little thick, but could be readily understood; tongue coated; pulse 76, regular and of good strength. The next day we came to Boston, the journey being made comfortably and without incident; the pulse was the same in rate and strength as at the beginning. A week was spent in Boston, with nothing worthy of note. Appetite remained good. A ride of an hour was taken every day. From this time until June 27th Mr. C. remained in about the same condition, perhaps becoming a little weaker. On this date his pulse intermitted for the first time, but the rate remained the same: there was a loss of a beat in every twelve. During the next ten days his mind became clearer, but he was not quite as strong. His speech was very good and easily understood. During all this time there had been rheumatic (?) pains in the shoulders, which were somewhat relieved by moving the arms.

There was much itching of the face and head, and a sensation of prickling in his tongue which felt thick.

July 8th the pains in the shoulder, and the movements in consequence, became more marked, and were relieved by a subcutaneous injection of one-eighth of a grain of sulphate of morphia every night about five o'clock. July 12th he did not look as well; and when he came back from his ride and had walked up stairs, his pulse was 92, but it soon fell to 84, which had been its rate for a few nights. There was no regular intermittence but an occasional beat would be missed; a thing noted at this time was that while the pulse was pretty strong the heart-sounds seemed weak and distant. July 13th he did not feel well and had nausea; he remained up stairs; in the afternoon he vomited, but went to sleep at eight and slept until two A. M., July 14th, when he became restless and wakeful. There was nausea during the morning with some vomiting. About twelve there were convulsive movements, with distortion of the face and outbreaks of crying. There was a sensation of a bubble in the ear. The left side, including that side of the face, was completely paralyzed. Mustard pastes were applied to the chest and all the extremities; subcutaneous injections of morphia (one-eighth of a grain) and six grains of calomel by stomach (which was retained) were given; about one he became quiet, and soon after unconscious. His pulse and respiration were normal; his pupils were equal (one-eighth of an inch across), and responded to light. His respirations soon became more rapid (30), his pulse 96.

About this time the right side became paralyzed; that is to say, he never moved a muscle from Tuesday, the 14th (his eyelids spasmodically opened and shut). There were a few light twitchings of his right hand on July 16th. Involuntary micturition began July 14th at midnight; no movement of the bowels. Death was momentarily expected from July 15th at three A. M. The right eye was wide open most of the time and could not be kept closed. All day on the 16th there was a difference noted in the strength and rapidity of the pulse on the right and left sides; at one time that on the left side was twelve beats slower than that on the right. All day Thursday (16th) the pupils were equal and reacted to light. At 10.30 P. M., July 16th, while sitting with my hand on the pulse, which was 160, it suddenly dropped to 44 and became very irregular; in ten minutes it was 160 again. The respiration and heart failed equally from this time, and both stopped almost simultaneously at 12.34 A. M., July 17th. At no time was any murmur heard anywhere.

Urine passed involuntarily July 16th. Color high; reaction very acid; specific gravity 1.028; urea +; uric acid +; chlorine normal; small trace of albumin; sugar absent; some sediment; urates, with a few bladder cells; no casts found.

Autopsy, July 17th, 4 P. M., about fifteen hours after death:

Body well developed and nourished. Rigor mortis present. Lividity of dependent portions. Pupils equal. Arcus senilis well marked.

Dura mater everywhere firmly adherent to the calvarium. Convulsions small; sulci deep; brain not as firm as usual; one small area of softening in the white matter of the right hemisphere, beneath the anterior ascending convolution, and another similar area in the optic thalamus. These areas were about one-quarter

of a centimetre in diameter and a little darker than the surrounding brain; otherwise nothing in the brain to suggest a hemorrhage, and these I considered to be due to the plugging of the arteries. All the arteries of the brain were very atheromatous. The carotids as they entered the skull cavity were like pipe-stems, but contained no clots. The basilar artery was tortuous with thickened walls (in two places calcareous), and its lumen was filled for its entire length with a solid clot somewhat firmly adherent in places to the intima. The arteries of the fissure of Sylvius, the posterior communicating and the anterior cerebral also, contained clots. The anterior communicating were thickened and small, but did not contain clots.

The meninges were much congested, but there was no evidence of any exudation.

The arteries everywhere showed evidences of atheroma, even the pulmonary arteries.

The aorta contained many patches of atheroma, some with calcareous deposits in them.

At one place in the arch, just opposite the opening of the left carotid, there was a patch of atheroma, one and one-half centimetres in diameter, with an area of necrosis in the centre, all the layers being destroyed; there was no thrombus at this point.

The pericardial sac was obliterated.

Heart about normal in size — all the valves competent, and showed nothing abnormal.

Upon opening the left ventricle, its cavity was found to be nearly filled with a thrombus attached to the wall. Upon removing this thrombus (which was made up of stratified blood-clot), the heart muscle was found to be very thin over an area five centimetres in diameter, and for a space two centimetres in diameter the wall was made up simply of adherent layers of the pericardium, upon the ventricular side of which there was a calcareous deposit two millimetres thick. This calcareous matter extended in places into the thrombus.

The right coronary artery was atheromatous but patent. The left coronary artery was atheromatous, and plugged with clots which had become calcareous. These clots began about one centimetre from the opening of the artery into the aorta.

The lungs were dark in color, crepitant, floated in water. Upon cut section, much frothy fluid tinged with blood could be squeezed out. No evidence of any former tubercular trouble. The mucous membrane of all the bronchi was much congested and covered with mucus.

Stomach and intestines normal.

Pancreas filled with fat.

Kidneys normal in size, and capsule peeled off readily. Cortex slightly diminished; numerous depressions on the surface.

Liver of chronic passive congestion.

Bladder normal.

Spleen two and one-half times the normal size and quite firm.

Testicles normal, soft.

Scar, one centimetre long, about two centimetres above the outer part of right eyebrow, but no evidence of old fracture beneath. No other scars found. Dupuytren's contraction of fourth and fifth fingers of right hand and thumb of left.

Anatomical Diagnosis: general arterio-sclerosis, atrophy of brain, thrombosis of arteries of brain, thrombosis of coronary artery, parietal thrombosis of

left ventricle, obliterating pericarditis, destruction of heart muscle, chronic splenitis, chronic passive congestion of liver, kidney of arterio-sclerosis.

Cause of death: primary arterio-sclerosis, immediate thrombosis of basilar artery and the coronary artery with parietal thrombus of heart.

Microscopical examination of a cut section of the basilar artery showed a great increase in the intima, with a loss of substance at one place, and to this "ulcer" the clot was adherent. The kidneys showed a slight increase of connective tissue, with thickening of the intima of the vessels.

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A CASE OF SYPHILIS OF THE HEART.¹

BY FREDERICK COGGESHALL, M.D.

THE case which I am about to report seemed to me and to the gentlemen who saw it with me one of great interest from the rarity of the lesion and the utter obscurity of the symptoms. I shall enter into full details as to the patient's previous history, because it was so misleading that it might well have led to a different diagnosis, and to a much more favorable prognosis than the result justified.

I was consulted last winter by a gentleman who complained of a dry, irritating cough, and of feelings of languor and exhaustion upon the slightest exertion, and nothing more.

He was a well-developed, well-nourished man of thirty-three, a teacher and writer by occupation, a fine athlete, and in the habit of practising difficult and exacting gymnastic feats. I had known him for four years, during which time he had always appeared to me to be in the best of health. He said he had not consulted a physician before for more than ten years. He had been accepted without hesitation by two conservative insurance companies within the past two years.

When a boy, he had had pneumonia twice, both times in the left lung, and had had scarlet fever with which he was very ill. Twelve or thirteen years ago he had been very wild, had occasionally abused alcohol, had smoked to great excess, had had gonorrheal arthritis twice. Twelve years ago he had a hard chancre, for which he was treated for three months, and from which he had never noticed the slightest symptom since. He had begun treatment before secondary symptoms appeared, as his physician was certain about the nature of the sore, and they had never manifested themselves.

Of late years, his life had been very different. He had been married nine years. (His wife had had one still-born, but no living child.) He had been a total abstainer for the last two years, and had only used alcohol occasionally for some years before. He smoked two or three cigars a week; but he afterward acknowledged that he chewed about four ounces of tobacco a week. Having a social position to maintain, he was naturally ashamed that he should be known to have such a filthy habit, and therefore he

¹ Read before the Clinical Section of the Suffolk District Medical Society, October 21, 1896.