

Original Communications.

ON ULCERATIVE INFLAMMATION OF THE VALVES OF THE HEART, AS A CAUSE OF PYÆMIA.

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At that time he was in a nervous, tremulous condition, the result of intemperance; besides which, the ordinary symptoms of jaundice were present, though not in a severe form. They had existed about a month or five weeks. The abdomen was full and distended. He had some pain, chiefly marked under the right ribs, and occasionally at the pit of the stomach. There had been much nausea and vomiting when the jaundice first appeared, but they had since subsided. He had had a previous attack, five years before. The stools were rather loose, quite clay-coloured; the urine high coloured, showing the purple colour in a marked degree with the acid test, indicating the presence of bile-acids. He was ordered two compound colocynth pills occasionally, and a dose of a mixture containing solution of acetate of ammonia, tincture of orange-peel, and chloric ether, three times a day; common diet, and half a pint of porter daily.

He quickly improved, lost his yellow colour and trembling condition, and was discharged cured on June 15th.

CASE IX. B. D., aged 50, female, was admitted on May 14th, 1863, with symptoms of jaundice to an extreme degree. The skin was of an intense greenish yellow hue, dry and harsh; urine as black as porter, depositing sediment; bowels costive. She did not complain of any pain, but was in a very low, weak state. The jaundice had been coming on about two months, and had been preceded by an attack of "slow" fever. She had vomited very much at first, but not latterly. She had not had a previous attack of jaundice. The urine, with the sulphuric acid test, showed distinctly the presence of bile-acids. She was ordered to take a grain of podophyllin, and two grains of extract of henbane in a pill, twice a day; and to have milk diet, and three ounces of wine daily.

May 19th. She remained much in the same state. The stools were perfectly clay-coloured. She was ordered a mixture containing chloric ether, tincture of orangepeel, and liquor ammoniæ acetatis. Sago or arrowroot was also ordered.

May 25th. Five grains of iodide of potassium were ordered to be taken three times a day in a decoction of sarsaparilla. The woman was becoming weaker; and the colour of the skin, if anything, darker than ever. There was also some distension of the abdomen. She was ordered four ounces of brandy, in addition to the wine; and a pint of beef-tea daily.

June 4th. The abdomen was more distended; she complained of great pain in it; and there was occasional sickness. A large blister was ordered to be applied to it.

She died the next day.

At the autopsy, the abdomen was found full of serum and flaky lymph. The liver was rather contracted, and hobnailed in places; of a dark green colour throughout. The gall-bladder contained extremely viscid bile and a few calculi. The common gall-duct was pervious, but the cystic duct was obstructed in one part.

THE GREEK FIRE BUBBLE. We believe that what people call Greek fire is nothing more than a strong solution of phosphorus in bisulphide of carbon. The employment of this compound in some way or other against any enemy has, we believe, been often suggested to our own War Department; and during the Crimean war Captain Disney invented some sort of shell to enclose the fluid. It does not appear, however, to be so destructive as is generally supposed. The phosphorus, of course, takes fire when the sulphide of carbon has evaporated, but it only ignites very inflammable substances. We are strongly disposed to doubt the spontaneous inflammability of the original Greek fire. It seems to us more probable that "naphtha" was thrown from engines, and was afterwards ignited by the balls of "sulphur and pitch from evergreen fires," projected ready lighted on arrows and javelins. (*Chemical News.*)

AMONG the more formidable evils sometimes resulting from that very common disease acute rheumatism, a poisoned state of the blood, analogous to pyæmia, and brought about by suppurative or ulcerative inflammation of the cardiac valves, must certainly be included. There are on record numerous instances of death, with all the signs and *post mortem* proofs of a purulent or contaminated state of the blood, occurring in the course of rheumatic fever, which clearly demonstrate the truth of this statement. But although the fact is well proved, and although most systematic writers on diseases of the heart allude to the occasional vitiation of the blood by the products of endocardial inflammation, yet the association in question is by no means generally recognised; and when a case of the kind occurs it is apt to perplex and mislead even the most practised observers. The following instance furnishes a striking illustration of this.

CASE.* J. W., a picture-frame maker, aged 23, was admitted into St. Bartholomew's Hospital, under the care of Dr. Burrows, on October 15th, 1862, suffering from ordinary rheumatic inflammation of several joints of the upper and lower extremities. He was a fairly nourished, dark-complexioned, man, with a peculiar, anxious, and depressed aspect. The face was flushed; the skin hot and perspiring, free from eruption; tongue much coated with moist yellowish-white fur; pulse 80, of good volume; appetite bad; thirst considerable; bowels relaxed from medicine; urine high coloured, with a sediment of urates. A slight systolic murmur was heard at the base of the heart. These, of course, were ordinary symptoms and signs of rheumatism; yet there was something in the appearance of the man which was unsatisfactory, and suggestive of failing power. This was the more significant since the patient was a very temperate man, in good circumstances, and had never been laid up with any previous illness. The attack began with pain in one hip eight days before admission, and the symptoms had gradually increased. There had been no rigor. The alkaline treatment for rheumatism was adopted, and a pint of beef-tea added to milk and arrowroot diet. He had no sleep the first night of his being in the hospital, but his condition next day (16th) was not materially altered. The bowels had acted five times, the motions being pale and relaxed; he felt sick occasionally. An aromatic draught with twenty minims of tincture of opium was administered, and the alkaline treatment continued.

On the 17th, he had had another bad night; being frequently disturbed by action of the bowels; the joints were better.

On the 18th, his bowels were still much relaxed. The tongue was more coated and very red. He had frequent nausea and vomiting of greenish fluid. An aromatic draught with half a drachm of aromatic spirits of ammonia, and ten minims of laudanum, three times a day, was now substituted for his alkaline mix-

* I am indebted for several particulars of this case to the daily notes of Mr. Connell Whipple, the clinical clerk in charge of it.

ture. Three ounces of brandy, and soda-water, were also ordered.

On the 19th, the amount of brandy was doubled, on account of the continuance of the vomiting and diarrhoea.

On the 20th, the bowels still continuing profusely relaxed, his aspect assumed the character of that of cholera, the eyes and cheeks being deeply sunken, and the bones of the face prominent; his speech was weak, and he appeared much exhausted; the feet and hands were cold; pulse 110, very small and feeble; tongue red and dry. The rheumatic affection appeared to have quite disappeared. He was ordered five grains of sesquicarbonate of ammonia, ten minims of chloric ether, a drachm of compound tincture of cardamoms, five minims of tincture of opium, and a drachm of mucilage, in peppermint water, every four hours.

On the 21st, he had suffered profuse diarrhoea during the night; the motions were very offensive, some passed involuntarily; he was frequently sick, vomiting a thin green fluid. His aspect was more indicative of exhaustion; there was a dark areola around the sunken eyes; the feet and hands were cold, the latter rather livid; pulse 90. He was ordered a starch and opium enema, continuance of the draught, and two grains of calomel and a grain of opium at bed-time.

On the 22nd, he passed a better night; the bowels acted twice only; extremities warm; tongue less red, and inclined to moisture; he still vomited occasionally; thirst great. Although the choleraic symptoms were thus subsiding, a new feature presented itself, viz., considerable swelling of the left parotid gland.

On the 23rd, the general symptoms continued to improve; the bowels acted only twice; the motions were dark green, with fecal matter; the urine was clear, of natural colour, slightly acid; the sickness had ceased. The other parotid was now affected, both being much swollen. The draught was continued, and a poppy fomentation ordered for the inflamed parotid.

On the 25th, there was no material change; some tincture of bark was added to the mixture.

On the 26th, he had passed a restless night; the conjunctivæ were injected; the face and hands very red, as if from a diffused eruption, being like that so frequently observed in the reaction after epidemic cholera. The left parotid was more swollen; the swelling of the right had almost disappeared. In other respects, his condition was much the same.

On the 28th, he had had good sleep from a dose of morphia. The redness of the face had diminished, but there were several irregular bright red slightly elevated spots on the hands and arms; none on the abdomen. During the next five or six days, the patient's general condition remained about the same; occasional diarrhoea and vomiting; the tongue constantly red, and thirst great. The eruption gradually disappeared, and the cuticle of the hands desquamated. The man's appetite improved a little, yet his aspect retained the same haggard sunken character; the left parotid suppurated, and the matter was evacuated. The strangeness of the symptoms and the continuance of the signs of irritation of the stomach and bowels, without obvious cause, led Dr. Burrows to suspect the possibility of some irritant poison being administered by the man's relations. Every precaution was accordingly taken to guard against this occurring.

On November 3rd, another change ensued. The man, after a restless night, was found to be completely hemiplegic on the right side; consciousness was obtuse, but not lost. The heart, ausculted again to-day, as it frequently was during the progress of the case, yielded no signs of increased mischief. The view now taken of the case was, that pyæmia existed—occasioned either by absorption of matter from the suppurating parotid, or, possibly, from suppuration of the left

valves of the heart; and that purulent deposit had occurred on the left side of the brain. It was also suggested, that possibly, some obstruction had occurred in one of the left cerebral arteries. The parotid was punctured again, and much matter let out. During the next three days the patient gradually sank, no noteworthy change in the symptoms occurring, and died quietly on the 7th.

The case was full of obscurity and anomalies, almost from the commencement. As the rheumatic symptoms subsided, those of choleraic diarrhoea or of irritant poisoning set in, and continued, with occasional abatement, to the end; then unintelligible inflammation and suppuration of the right parotid; then hemiplegia terminating in death. What was the cause? The autopsy explained it, and cleared up the mystery.

The left middle cerebral artery and its principal branches were found obstructed by firm fibrinous clots. The left corpus striatum was reduced by pale softening almost to the consistence of pulp. This explained the hemiplegia. But what occasioned the arterial obstruction? Numerous granular vegetations were found on the auricular surface of the mitral valve just above its free border, also along the tendinous cords, especially at their junction with the valve. Similar granules, though fewer in number, existed along the festooned borders of the aortic valves; and traces of them were also found on the tricuspid and pulmonary valves.

The mitral valve was especially diseased. Besides the granules, films of soft fibrinous material could readily be scraped from the surface, leaving the endocardium beneath red, rough, and granulated. The tissue of the valve was highly vascular; several minute vessels being clearly visible by the naked eye, still more with the microscope. The vessels were very tortuous, gorged with blood, and several of them could be traced almost to the edge of the valve. The tissue of the valve, especially where most granular, presented, when examined with a lens, an uneven, jagged appearance, very much like that of the surface of an ulcerating wart. Here there were unmistakable signs of recent acute inflammation, exudation, and slight superficial ulceration, of the mitral valve, and commencing similar mischief in the other valves. Part of the granular matter was readily separable after death; and it is reasonable to believe that some had been washed off during life, and that its arrest in the smaller branches of the left middle cerebral artery had, by obstructing the channels there, occasioned obstruction and coagulation in the main channel behind it, and also in the corresponding carotid, which was likewise found occupied by mixed yellow and red coagula. This view was strongly supported by the existence of two wedge-like masses of yellow fibrinous matter in the spleen; and by a similar large mass, surrounded by a dusky red zone, in the cortex of the left kidney. Such masses are now well-known attendants on these cases of blood-vitiation from diseased cardiac valves. Another common attendant on such cases also existed here; namely, a greatly congested state of the intestinal mucous membrane, with considerable enlargement of the solitary and agminate glands of Peyer. Much of the left parotid gland was found in a state of suppuration. Nothing else noteworthy was discovered in the body, except a few small greyish deposits in one lung, near the surface; the pleura over them was vascular, and coated with recent soft lymph.

Surely the pathology of this case is quite clear; ordinary rheumatism in the first instance; then acute ulcerative inflammation of the mitral valve; then contamination of the arterial blood by lymph, pus, and other inflammatory products from the valve; then the signs of general blood-poisoning—namely, febrile disturbance of a low typhoid form, nausea, vomiting, profuse diarrhoea, and erythematous eruption; then local suppuration in the parotids; lastly, obstruction of the cerebral

vessels, with consequent softening of the brain-substance and hemiplegia; all terminating in death, and revealing proofs of blood-poisoning in various parts of the body. Such, manifestly, are the main links and their real sequence, in this chain of morbid phenomena; and this interpretation of them is, I think, of great importance in regard to the whole of this obscure subject.

Until of late these fearful results of acute suppurative endocarditis have not attracted much notice, although particular attention was drawn to the subject by myself in 1852 (*Med.-Chir. Trans.*, 1852, page 316). Casual allusions to them, however, in various works, show that their import has not been altogether overlooked. Dr. Watson, for example, after alluding to the separation of fibrinous particles from inflamed valves, as among the accidental results of rheumatic endocarditis, and remarking that the primary effects of such detachment are mechanical, pointedly continues, "but it is very conceivable that the whole mass of the blood may, in certain cases, be contaminated by the admixture of some of the fluid products of endocardial inflammation." (*Practice of Physic*, 4th Edition, vol. ii, p. 315.) He then gives the particulars of two fatal cases of rheumatic endocarditis, in which extensive ulceration of the aortic valves was discovered after death; and observes that, "with such mischief in rapid progress within the heart, it is easy to see how the blood may be polluted and charged with a new poison in its very fountain."

Friedreich, too, among other recent writers, specially draws attention to these pyæmic effects of ulcerative endocarditis. (Virchow, *Handb. der Path.*, Bd. v, s. 323.) His observations confirm what the researches of Rokitsky (*Handb. der path. Anat.*, 1st Edition) and others, including my own (*Med.-Chir. Trans.*, 1852), had already established. Although we thus meet with occasional references to this subject, yet, as already observed, it is only of late that it has been fully worked out. In June 1862, appeared a masterly essay on the subject, by MM. Charcot and Vulpian (*Gaz. Méd. de Paris*); and this was followed, in October of the same year, by another clever paper by Lanceraux (*ib.*). In these two essays, and in an able paper by Leudet, on Aortitis and Purulent Infection thereby occasioned (*Archiv. Gén. de Médecine*, 1861, p. 575), may be found a summary of nearly all at present known on the subject, together with several illustrative cases, and ample references to modern and former observations on ulcerative endocarditis. It is therein shown that, as in the case I have just narrated, suppurative and ulcerative inflammation of the valves of the heart may contaminate the blood with inflammatory products, and thus occasion the ordinary signs of pyæmia, such as febrile disturbance of a low typhoid character, occasionally complicated with jaundice, and followed by purulent deposits and death.

It may seem curious that common rheumatic inflammation of the valves of the heart does not produce similar grave results, for the blood in such cases must be largely contaminated by inflammatory products. No doubt, such contamination does exist, and probably explains many of the febrile symptoms in acute rheumatism; but, in order that the more serious pyæmic effects should result, it is probably requisite that ulcerative destruction, with suppuration, should exist. Why such extreme effects should happen in some rheumatic cases, and not in others, is by no means clear. Recorded cases, however, seem to show that ulcerative destruction is especially liable to occur in those who have been greatly debilitated, who have led intemperate lives, or who are peculiarly cachectic. The mischief in such cases usually runs a very rapid course, and in nearly all cases seems to be fatal.

Generally, this ulcerative inflammation of the cardiac valves seems to occur in association with rheumatism.

Not always, however, is this the case. Charcot, Vulpian, and Lanceraux, refer to instances in which no rheumatic or other attendant morbid condition existed to account for the affection. Dr. J. W. Ogle's analyses of cases of ulceration of the cardiac valves is confirmatory of this (*Pathological Transactions*, vol. ix); and several instances of acute ulcerative destruction of the valves independent of rheumatism have come under my own observation.

Usually such cases seem to occur in debilitated cachectic subjects; in those who have been depressed by intemperate habits, exhausted by mental anxiety, or who exhibit signs of imperfect nutrition of their tissues, with commencing fatty degeneration. In such cases, the tissue of the valves, whether in consequence of a low inflammatory process or of mere degeneration, seems to undergo a kind of acute atrophy, softens, breaks down, and leaves an ulcerated surface with rough jagged edges, to which fibrinous concretions from the blood adhere. In several instances, this form of ulcerative destruction has been met with in pregnancy.

Another form of ulceration occurs in connection with softening of atheromatous material in the substance of the valve, and subsequent destruction of the superjacent endocardial membrane. Death, ensuing rapidly and under very obscure conditions, has not unfrequently been thus brought about.

Examples of these several forms of non-rheumatic ulceration of the cardiac valves have fallen under my notice, and may furnish the subject of another communication.

MORTALITY IN THE ARMY IN VARIOUS STATIONS. Dr. Franklyn gives the following comparison (from published statistics) between the health of the army before and after the Crimean war. Commencing with the West Indies, one of the most unhealthy stations for white troops, we find, by statistics compiled up to 1860, that in Jamaica the mortality ran as high as 260 in 1,000 of strength per annum, or a British regiment was entirely destroyed in about three and a half years. At a later period, the mean of four healthy years gave in the same colony 67 deaths in 1,000 of strength per annum. Up to 1855, it was as high as 60.8 per 1,000 of strength; it is now reduced to 20.4 per 1,000. In Trinidad, the mortality was 106.3 per 1,000 of strength. A regiment was destroyed in seven years. In 1859, with an epidemic of yellow fever, it was reduced to 89 per 1,000 of strength. In 1860, there was not a single death. In Barbadoes, the mortality was 58.8 per 1,000; it is now 6.36 per 1,000. In St. Lucia, the mortality was 122.8 per 1,000; in 1859, not one death occurred; in 1860, one only occurred. In British Guiana, the mortality was 74 per 1,000; in 1859, it fell to 13.9 per 1,000; in 1860, it went down to 6.6 per 1,000. In Canada, the mortality was 16.1 per 1,000; it is now 10.1 per 1,000, including invalids who may die at home. In Nova Scotia, the mortality was 15.1 per 1,000; now it is 7.23 per 1,000. In Newfoundland, the mortality was 11 per 1,000; it is now 4.8 per 1,000. In Bermuda, the mortality was 28 per 1,000; now it is 8.55 per 1,000. In Gibraltar, the mortality was 11.1 per 1,000; now it is 7.18 per 1,000. In Malta, it was 18.2 per 1,000 men, and sometimes went as high as 40.3 per 1,000; now it is reduced to 10.5 per 1,000. In Ionia, the mortality was 15.5 per 1,000; now it is only 7.08 per 1,000. In the Mauritius, 17 per 1,000 is about the average mortality. In Ceylon, about 19 per 1,000. In India (Bengal), the Medical Department has not been assisted sufficiently yet, nor have the changes recommended been carried out; but all is progressing slowly towards a better state of things. In Australia, the mortality generally is 11 to 14 per 1,000 men. In New Zealand, 13 per 1,000.