

## ON EXCESSIVE INSUFFICIENCY OF THE HEART'S ACTION:

A FREQUENT AND NOTEWORTHY COMPLICATION OF DIABETES MELLITUS.

BY RICHARD SCHMITZ, M.D., NEUENAHF.

*(Translated from the German, at the Author's request, by DAVID PAGE, M.D., Kendal.)*

IN well-marked cases of diabetes of somewhat long standing the advent is not unfrequently observed of symptoms which, although often ascribed to congestive states of the brain, are in reality an expression of the contrary condition. These symptoms are chiefly: great shortness of breath; a sometimes sudden loss of appetite; giddiness; somnolency; a tendency to faint; occasional loss of consciousness; vomiting; and even convulsions and transient paralytic phenomena. Bodily exertion excites and aggravates these symptoms; whilst absolute rest in the horizontal position and the use of stimulants palliate and even tend to remove them. In such patients the pulse is small and weak, sometimes quick, sometimes remarkably slow, and at times intermittent; the respiration hurried but often normal. *The impulse of the heart is always very weak, indeed scarcely to be felt*; and the sounds over the præcordia and along the great vessels are exceedingly faint and indistinct. The first sound at the apex is often hardly, and at times not at all, perceptible. Patients of this kind frequently die very suddenly, but in most of the cases in which the above symptoms have been of some duration a condition of coma supervenes, from which the patient cannot be aroused. It is therefore quite evident that in such cases we have to deal with a state of extreme cardiac debility—the expression of enervation and fatty degeneration of the heart. Now this pathological condition is a very usual one to find in chronic diabetes, and one which is readily enough intelligible.

If, then, we consider the many risks to which the weak heart of fatty degeneration is constantly exposed, an explanation is not far to seek why so many of these patients are cut off suddenly, as well as reasons for the most sedulous watchfulness and attention in their treatment.

Of 109 diabetic patients who have come under my observation, 80 exhibited all the phenomena, already cited, of a feeble heart, although the subjective symptoms present to a greater or less degree in most were absent in a few. In twelve of these cases the disease terminated suddenly, death taking place at once in three instances, and in the remaining nine being preceded with well-marked cardiac paralysis. In all of the twelve the subjective phenomena and physical signs of heart disorder existed, and in eight the fatal termination had immediately followed upon undue bodily exertion.

In the case of two patients who had, by long and fatiguing journeys, tested too severely the capabilities of the heart's performance, I was able at once, upon their arrival at Neuenahr, to recognise profound failure of the circulation. In both cases neglect of strict injunctions of absolute rest led to rapid aggravation of the symptoms, and the patients succumbed in spite of the administration of the strongest stimulants. In seven other cases, in which also the symptoms had increased to an alarming degree in consequence of bodily fatigue, absolute rest in the horizontal position and the exhibition of stimulants were successful in alleviating the distress and causing them gradually to disappear.

In practical illustration of this insidious and little noticed complication of diabetes, the following brief details of the clinical history of two cases may prove instructive.

CASE 1.—Herr M—, formerly in good health, and in whose family no inherited diabetic predisposition is known to exist, suffered, in April, 1872, from an exceedingly painful injury to the foot. The wound shortly healed, but the patient failed to regain his ordinary state of health, and began to lose flesh and strength. These symptoms were accompanied by intense thirst and an increased secretion of urine, an examination of which placed the presence of diabetes beyond doubt. The patient, who was sent to me by Prof. Rühle of Bonn, came under treatment in June, 1873.

Present condition.—He is twenty-four years of age; de-

jected and apathetic in appearance; listless, and answers but slowly upon repeated questioning. Owing to cataract, he cannot see with the right eye and but indistinctly with the left. He complains of a sense of great weariness and unfitness for exertion, and is so languid that he can with difficulty walk a few yards. He suffers from shortness of breathing, but sleeps much and soundly. Complains also of lightness of the head, giddiness, inability to think clearly, and attacks of unconsciousness. These symptoms are aggravated upon exertion, and relieved by persistent rest. He has tormenting thirst and but little appetite; digestion irregular, and tendency to diarrhoea; skin dry and parched; muscles and subcutaneous fat badly developed; tongue dry and heavily coated; mucous membrane very anæmic. His breath has a stinking and unpleasant smell. Pulse 94, very small and intermittent. Body weight 105 lb. avoirdupois; having lost thirty pounds within four months.

The physical examination of the chest, which was somewhat flattened, revealed in regard to the lungs nothing abnormal save rather prolonged expiration over the scapular regions. The impulse of the heart was, however, remarkably weak, hardly perceptible; the heart sounds were very indistinct and faint, the first sound at the apex scarcely audible. Liver and spleen normal. The daily secretion of urine pale, yellow, and faintly acid; specific gravity 1030; no albumen; grape sugar 4·8 per cent. The urine voided during the night bright-yellow, faintly acid, sp. gr. 1030, no albumen; grape sugar 4 per cent. Total quantity voided in twenty-four hours, 124 ounces.

The treatment was primarily directed to the enfeebled action of the heart, and warding of impending danger of paralysis, with which object in view all physical exercise was forbidden, and rest in the horizontal position, as much as possible in the open air, enjoined. Strict diabetic diet, embracing the most nutritive kinds of food and stimulants, was prescribed, with a simple preparation of iron combined with the etherial tincture of castor. The patient was allowed to drink from six to eight glasses of the Sprudel daily.<sup>1</sup>

June 29th.—Manifest improvement. Less giddiness and inclination to drowsiness. Pulse 72, stronger, but still intermittent.

7th.—Vertigo has disappeared, increasing strength, better appetite, and less thirst. Pulse 80, stronger, and no intermittency. First sound of the heart is now distinctly audible at the apex. Day urine pale-yellow, faintly acid, sp. gr. 1026; grape sugar 1 per cent. Night urine pale-yellow, neutral, sp. gr. 1020; grape sugar 0·5 per cent. Quantity passed in twenty-four hours, 76 oz.

11th.—Feels stronger, and is able to go out a little. Pulse 76, strong. Heart sounds more distinct, appetite good, but little thirst. Tongue moist and clean; no fetor of the breath. Has gained three pounds and a half in weight. Day urine pale-yellow, faintly acid, sp. gr. 1020, mere traces of sugar, of which there is none in that voided during the night. Quantity secreted during the twenty-four hours, 50 oz.

20th.—Condition about the same, save that a reappearance of the sugar in the urine has taken place to the extent of 7 per cent. during the day, and 4 per cent. at night. Total secretion in the twenty-four hours, 52 oz.

27th.—Further improvement, patient feeling quite well and strong; pulse 72. Specific gravity of the urine, 1010; total absence of sugar; secretion in the twenty-four hours, 47 oz. Gain of 2½ lb. in weight.

Aug. 12th.—Continued absence of all diabetic symptoms and further increase of 3¼ lb. in weight.

The patient returned to Bonn, where he placed himself under the treatment of Professor Saemisch, who successfully performed the operation for cataract in the left eye. Since 1873, I have heard from time to time from him. He has been able to resume his occupation, and continues well and perfectly free from all symptoms of diabetes.

CASE 2.—Herr L—, aged fifty-seven years, came to me in August, 1874. Nothing is known as to the causes of death of his parents, but a nephew suffered from diabetes, for which he had been successfully treated by myself. The

<sup>1</sup> The Sprudel (Der grosse Sprudel so-called) is the chief of several mineral springs at Neuenahr. These springs arise from the basaltic formation of the Ahr valley strongly charged with carbonic acid gas, at various degrees of temperature (the Sprudel at 104° Fahr.), and possess alkaline combined with slightly chalybeate qualities. At the adjoining hamlet of Heppingen is the now well-known Apollinaris spring. Neuenahr is about seven miles from Remagen-on-the-Rhine.—TRANSLATOR.

patient has five children, all of whom are healthy. In his case the symptoms of the disease were discovered for the first time about three years ago. No assignable cause.

*Present condition.*—He is much emaciated and broken-down in appearance, stoops, and his gait is slow and unsteady. The expression of his countenance, which is flushed, is rather anxious than apathetic. Skin dry and harsh; muscles and adipose tissue dwindled away; pulse 88, very weak, hardly perceptible. Temperature normal; tongue dry and furred; mucous membrane bloodless; strong fetor of the breath; he complains of excessive weakness and shortness of breath; great inclination to sleep; has frequent and violent attacks of vertigo; no appetite; tormenting thirst. The physical examination shows the lungs to be sound; heart's impulse very weak, scarcely perceptible; first sound at the apex indistinct and almost inaudible; liver and spleen normal. Body weight, 108 lb. avoirdupois; has lost much weight during the last three years. Day urine: pale yellow, acid; sp. gr. 1044; grape sugar, 8 per cent; no albumen. Night urine: yellow; acid; sp. gr. 1044, grape sugar, 8 per cent; no albumen; quantity voided in twenty-four hours, 196 oz.

In consideration of the extreme debility of the heart, rest in the horizontal position was enjoined, all walking or standing being absolutely interdicted. The strongest nourishment was ordered, with generous hock, cognac, strong coffee or tea, and beef essence; to allay thirst, cold Sprudel.

Aug. 5th.—The patient feels somewhat stronger and less oppressed. Pulse 68, weak; appetite a little better, but otherwise no improvement.

7th.—Notwithstanding my earnest prohibition of all movement, the patient went out of doors yesterday and again to day, having this morning gone, while fasting, to the spring, to drink the waters there. I saw him at six o'clock in the evening, when he was extremely prostrate and suffering from dyspnoea. Pulse hardly perceptible, intermittent, and very irregular, ranging between 40 and 50 beats to the minute; first sound of the heart inaudible; respiration 40; temperature 97.5° F. Mustard poultices applied to the chest, and strong coffee and brandy administered, with ten-grain doses of carbonate of ammonia every hour. At eight o'clock I found the patient a little better; the pulse had increased to 70, but was still intermittent; respiration 30. At midnight he felt much oppressed, and vomited; threatening syncope; pulse not perceptible. Strong coffee with a large dose of musk brought about immediate improvement; the pulse returned, dyspnoea was relieved, and the feeling of nausea and faintness disappeared.

8th.—At 6 A.M. I found the patient pulseless and in a drowsy condition. Fifteen grains of musk brought about for an hour a return of the pulse and consciousness, when the patient thereafter became comatose and died towards evening.

It is from a consideration of facts such as these, which I have sought to illustrate in the above-cited instances, that I am led to insist most emphatically upon the supreme importance of exercising without delay close watchfulness and control over the action of the heart in all cases of diabetes. Should the physical examination warrant the presumption of a feeble, fatty, degenerated heart, then the patient ought, above everything else, to be warned of the risk he incurs by undue effort of the body. In this way, and by the administration of nutritive food, with the moderate use of stimulants, the exhibition of some preparation of iron, and lastly, when within the patient's means, a residence in a pure, dry, and bracing atmosphere, many of the most dangerous accidents will with certainty be prevented.<sup>2</sup> I would repeat that, whenever the symptoms in diabetes assume an alarming character, no time should be lost in enforcing absolute rest and pushing the administration of powerful stimulants.

<sup>2</sup> As an excellent winter resort for the diabetic invalid, the warm, dry, and stimulating climate of the Riviera, especially of Bordighera, is to be recommended.

## EXCISION OF A LARGE PORTION OF THE FEMUR AFTER GUNSHOT WOUND.

By W. P. TRITTON, M.R.C.S. ENG., L.S.A. LOND.,  
LATE SURGEON-IN-CHIEF, ZARBLANE HOSPITAL, CONSTANTINOPLE.

I WAS one of the surgeons employed during the late Russo-Turkish war, and the notes of a case that occurred in my practice during that time may perhaps be of interest to the readers of THE LANCET.

The patient, an Arab serving in the Turkish army, was a well-built man about 5 ft. 9 in. in height, and about thirty years of age. He had enjoyed good health up to the time of his being wounded. In the early part of December, 1877, he was admitted into the "Kishlah," a large military barracks in Adrianople, converted into a hospital during the war. When I first saw him, he stated he had been wounded about twelve days before. He had seen a doctor at the front, who had put on rough splints and sent him down with the other wounded.

On making an examination of the leg, I found it somewhat swollen and œdematous. There was a bullet wound in the middle third of the thigh, the ball having passed through the limb from without inwards, and from both the aperture of entry and exit of the ball there exuded a thin pus. I then made a further examination by means of a probe and my little finger, and found a great many small fragments of bone and one large one, all of which were quite loose. It was evident this was a compound comminuted fracture of the femur, and the treatment usually set forward in such cases is immediate amputation. I was very unwilling to perform this operation, as every case with us of amputation of the thigh had proved fatal. Besides, the leg seemed in such good condition, and the man's health had suffered so little, it looked almost a pity to sacrifice the limb. I removed some of the smaller fragments of bone, and again examined it very carefully, and my opinion was that the continuity of the bone was not altogether destroyed by the ball, but the periosteum on the anterior surface appeared to have been preserved by the aponeurosis of the anterior muscles of the thigh, and a thin layer of callus was thrown out on the under surface of this periosteum. Supposing my diagnosis to be correct, I thought the limb might be saved, so I decided to put the patient under chloroform and make an even more thorough examination. This was done, and I removed through the wounds as many splinters of bone as possible. I was then enabled to get my fingers in on each side; by this means I found the femur was split up considerably in the direction of its long axis, but I still made out that there was a thin arch of bone anteriorly, which kept up the continuity.

Under these circumstances I determined to perform a resection of the bone, and to remove all the fragments, thus endeavouring to save the limb. I was surrounded by four or five Turkish surgeons, two or three Germans, and a Greek, who were all working in the same hospital. I invited them to examine the case, which most of them did. I then explained what I intended doing, and asked their opinion, but they all, without exception, opposed my views. They held that the bone was completely shattered, and nothing but amputation was possible. They ridiculed the idea of my performing a resection and saving a useful limb. They declared that when I got half through the operation I should find my diagnosis was wrong, and would in the end be compelled to amputate. Well, in the face of such strong opposition, I was at a loss how to act, so I requested Dr. Sandwith, of the Stafford House Society, who was then working in another part of the same hospital, to examine the case with me. He very kindly did so, and agreed with me in a modified operation being possible; so I made up my mind to operate in spite of the antagonism of my Eastern colleagues. I began by enlarging the wound on the outer side of the thigh, making an incision four inches long down to the bone. I then did the same on the inner side. Avoiding the artery by this means, I was able to remove all the remaining fragments with the exception of the large one before alluded to, which I had to nip in two with the forceps, and remove in pieces. This main piece was about five inches in length, and was split right into the medullary cavity. The ball seems to have struck the bone a little pos-

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