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THE RELIEF OF CARDIAC ENLARGEMENT BY SURGICAL MEASURES.

By G. A. GIBSON, M.D., LL.D.

When any therapeutic method is in its infancy, every instance in which it has been adopted is of value as an aid in attempting to form an estimate of the practical utility of the procedure employed. The chief aim of the present contribution is accordingly to relate the facts regarding a patient for whom the assistance of surgery was invoked for the relief of some urgent cardiac symptoms. But, as the patient presented considerable difficulties in diagnosis in consequence of a suspicion that there might be adherent pericardium, the case is of interest in its bearing upon the determination of one of the clinical conditions most troublesome to recognise.

A joiner, aged 37, born at Ayr, and residing in Leith, was sent by Dr. D. R. Murray to my ward on 13th October 1908, complaining of shortness of breath and feelings of oppression, as well as swelling of the ankles after exertion. He stated that his father was in good health, and that his mother had died, seven years before his admission, of heart disease; he had six brothers and two sisters, who were all in good health. He had always had good food, and had been a temperate man, drinking beer rather than whisky, but not more than one pint a day. He had not been exposed to weather in his occupation, his particular duty being to fit up the cabins of yachts. His home surroundings had always been quite satisfactory.

He fractured his left thigh when 19 years old, and had suffered from an inflammatory affection of the lower end of his right tibia two years before admission. He had been ill with a slight rheumatic fever about sixteen years before, and had been troubled with dull pains in many of his joints at intervals since that time.

He stated that, since the rheumatic fever, he had been short of breath. This had occasionally become more aggravated. His feet had been swollen at night; this was first noticed after the affection of his leg.

The patient was found to be a well-nourished man, 5 ft. 7½ in. in height, and 9 st. 8¾ lb. in weight. There was no anæmia, cyanosis, or dropsy. A pigmented scar was seen over the lower

end of the right tibia where the bone had been diseased. The left leg was slightly shorter than the right. The great trochanter of the left femur was much more prominent than that of the right. The patient's expression was cheerful, and he was able to lie in any position in bed. He felt no pain in his chest, but suffered from slight palpitation when excited. There was no faintness, but the patient became very short of breath on exertion.

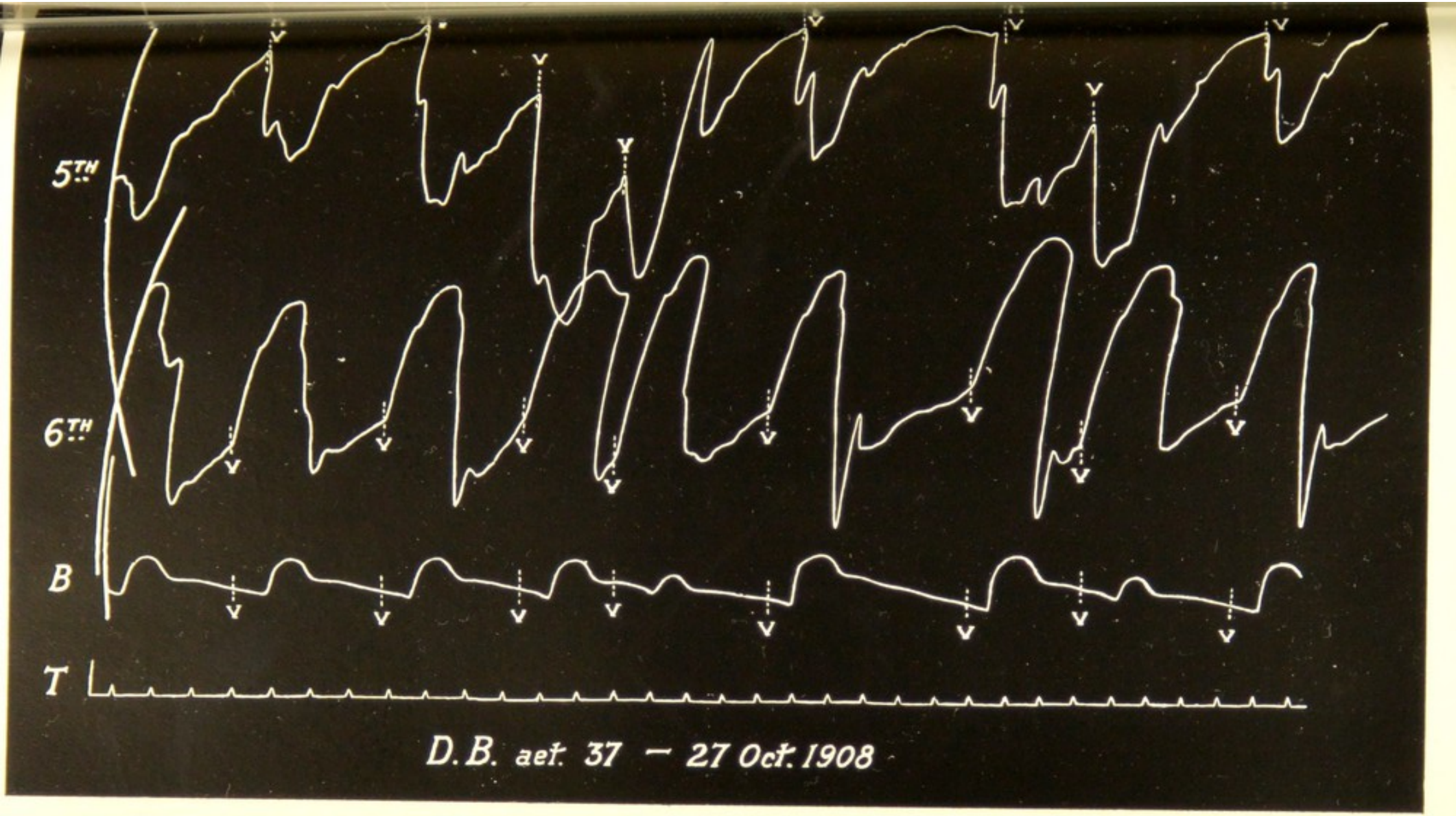
The arteries had healthy walls in every accessible position. Palpation did not seem to indicate any considerable increase of pressure, yet it was found on examination with the sphygmomanometer to reach 180 mm. Hg. as its maximum. The pulse-rate was moderate, being on an average about 70 per minute; it was very irregular, but each individual pulsation showed no characteristic departure from the usual characters.

The præcordia were well formed. There was no marked bulging; the 5th and 6th intercostal spaces, however, moved with each beat of the heart. An area in the 5th interspace was drawn in at each systole. There was slight epigastric pulsation, and pulsation also on the right side of the neck, which followed the apex beat. The cardiac impulse was well marked and diffuse, the maximum intensity being felt at a point in the 6th intercostal space 6 inches from the middle of the sternum. The apex beat was irregular in rhythm, and heaving in character; the impulse was well sustained. The upper border of the heart was at the level of the upper border of the third rib. The right margin of the heart was $1\frac{1}{4}$ inches to the right, and the left $6\frac{1}{2}$ to the left of the midsternum.

The apex of the heart was singularly fixed. On moving the patient to either side the position of the impulse was absolutely immovable. The left half of the epigastrium was drawn in during systole, and the 4th and 5th intercostal spaces were also retracted during this phase. There was, however, no indrawing of the interspaces to the left of the apex, and there also was no retraction of any of the posterior interspaces.

There were presystolic and systolic murmurs heard most distinctly in the mitral area, and both propagated chiefly towards the axilla. There was a systolic tricuspid murmur, and the second sound was accentuated in the pulmonary area.

A tracing, taken by Dr. W. T. Ritchie, my Clinical Tutor, shows the pulsation of the brachial artery, of the apex, and of the 5th intercostal space. It will be observed that while the apex beat has a well-marked positive wave, there is a distinct recession of the 5th intercostal space.


5TH
6TH
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The lymphatic glands were not enlarged in any region, and the thyroid gland and spleen were normal. The blood gave the following appearances :—

Hæmoglobin	85 per cent.
Erythrocytes	5,420,000
Leucocytes	7,000

The differential count gave :—

Polymorphonuclears . . .	65 per cent.
Small lymphocytes . . .	25 „
Large „ . . .	4 „
Eosinophiles	6 „

The patient suffered much from shortness of breath, which was exaggerated on exertion. There was considerable cough, which was worst during the night and in the morning, accompanied by a pigmented viscid sputum. The respirations were 20 per minute, with a regular rhythm. There was no inspiratory retraction of intercostal spaces. The voice was clear and natural.

The chest was well formed, and moved slightly with respiration. It measured 36½ inches on expiration, and 37 inches on inspiration. The vocal fremitus was equal on both sides. There was no change from the normal on percussion or auscultation.

The urine was scanty, but contained no abnormal constituents.

The patient obviously suffered from obstruction and regurgitation at the mitral orifice, with cardiac hypertrophy and dilatation, leading to tricuspid incompetence; but in addition to these conclusions a further question, and one of much greater difficulty, arose from the indrawing of the epigastrium and 4th and 5th intercostal spaces during the cardiac systole. The suspicion naturally arose that the patient might have developed adhesions between the parietal and visceral layers of the pericardium at the time when he suffered from endocarditis. This suspicion was somewhat strengthened by the remarkable fixity of the apex beat. There was, however, nothing like the diastolic rebound so characteristic of adherent pericardium, and there were no appearances of any changes in the veins of the neck, such as are sometimes seen in that condition. The whole facts were discussed in a clinical lecture delivered on 27th November 1908, in which the possibility of adherent pericardium was fully considered, but was left an open question.

As the patient was suffering very considerably from cardiac uneasiness and cyanosis, the practical question of treatment became urgent, and although his condition was not promising, it was determined that the operation of cardiolysis afforded him the best prospect of relief from his symptoms. Mr. Caird, who saw the patient with me, entirely concurred in my views; the position of matters was fully placed before the patient, and as he grasped at any prospect of relief, he was transferred, on 1st November, to the care of Mr. Caird. A few days afterwards, while the patient was under the influence of ether, administered by the open method, Mr. Caird made a crescentic incision in the left half of the chest, and removed a few inches of the 4th and 5th ribs. Neither the pleura nor the pericardium was interfered with, and after the removal of the ribs the soft tissues were replaced, and the wound in the skin stitched up. The patient's progress was uneventful, and about a week after the operation he described himself as feeling very much better. The breathlessness in particular had become less troublesome, and he looked better in every way.

This improvement, unfortunately, did not last long, and the cyanosis again became more marked, while œdema showed itself in the lower extremities. As the wound had been long healed and the patient required no further surgical assistance, he was readmitted to my ward on 25th November, when it was found that the œdema had reached as far as the middle of the thighs. The pulse was extremely irregular; the condition of the heart was very much as it had been when he was in the ward before, and there was no enlargement either of liver or of spleen. There was, further, no ascites. Some improvement resulted after a few days, but this was followed by a relapse accompanied by noisy delirium, for which he had to be transferred to the ward for acute nervous affections. Here he unfortunately developed erysipelas of the face, which speedily brought about a fatal termination.

A post-mortem examination was performed by Dr. Shennan on 30th November. It revealed the presence of old-standing mitral obstruction, with incompetence of the valves, and dilatation of the tricuspid orifice, also attended by valvular incompetence. There was no trace of any pericardial adhesion; the pericardium, in fact, was absolutely healthy. The interesting point revealed was the existence of very strong extra-pericardial adhesions fixing the parietal pericardium to the sternum, costal cartilages and ribs much more firmly than is commonly seen. The lungs

showed chronic venous stasis, while the liver, spleen, and kidneys also showed venous congestion.

The facts which have been described are of no value in attempting to form an estimate of the benefits to be derived from operation in more favourable cases; as has, however, been already remarked, every instance, whether satisfactory or otherwise, ought to be narrated in the case of new methods. Some further experiences of mine in this direction will shortly be published.

An attempt to relieve a labouring heart by thoracostomy was originally suggested, as far as consists with my knowledge, by Morison [1] in 1897. It was first carried out, however, for Brauer [2] by Petersen and Simon. Since the date of the three operations described by Brauer, Wenckebach [3] has published details of a case performed by Koch, and this was followed by one carried out for Morison [4] by Stabb. It is too soon yet to discuss the results of these operations, but in some of the cases great relief followed the procedure adopted.

From the point of view of diagnosis, it is interesting to observe that there may be absolute fixation of the heart without adherent pericardium in the ordinary sense of adhesions between the epicardium and pericardium. The extra-pericardial adhesions present in this case must certainly be somewhat uncommon, except in association with pleural adhesions, and, as nothing of the kind was present, it is impossible to account for the origin of the strong fibrous connections. The indrawing during systole of the epigastrium, and of the region above and around the apex, but not of the apex itself, was suspicious but not pathognomonic of adherent pericardium; and the absence of any diastolic rebound, as well as of any diastolic collapse of the veins, prevented the positive diagnosis of such a condition.

References.—[1] *On Cardiac Failure and its Treatment*, London, 1897, p. 89. [2] *Archiv. für klin. Chir.*, 1903, Bd. lxxi. S. 258; *Verhandl. der deutsch. Gesellsch. für Chir.*, 1903, Bd. xxxii. S. 133; *Verhandl. des XXI. Congresses für innere Medizin*, 1904, S. 187. [3] *Brit. Med. Journ.*, 1907, vol. i. p. 63. [4] *Lancet*, 1908, vol. ii. p. 7.