1895), vol. i, pp. 77, 82, 88, 91. ¹⁵ *Transactions of the British Congress on Tuberculosis*, vol. iii, p. 39, et seq. ¹⁶ *Ibid*, p. 81, et seq. ¹⁷ Quoted by Dr. Burney Yeo, *Climate and Health Resorts*, p. 26, et seq. ¹⁸ *Med. Chir. Trans.*, vol. lxxxiv, p. 29. ¹⁹ *Tropical Diseases* (1900), p. 120.

CASE OF

PYOPERICARDITIS: PYOPNEUMO-PERICARDIUM:
PNEUMOCOCCUS PYAEMIA.

BY

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WITH NOTES ON THE OPERATIONS BY

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In the year 1883 Samuel West, in describing a case of purulent pericarditis which had been successfully operated on, speaks of this condition as "one of the rarest of clinical rarities."⁴

Batten, in the *BRITISH MEDICAL JOURNAL* (1901), in giving an analysis of necropsies, writes of pyopericarditis, that "it is a disease seldom suspected, still more rarely diagnosed, and hardly ever treated, and yet it is one that is present in nearly 3 per cent. of the deaths in the records of the Children's Hospital."

In the *Annals of Surgery*, Philadelphia, for the year 1900, C. B. Porter published an article entitled *Suppurative Pericarditis and its Surgical Treatment, with an Analysis of Fifty-one Cases reported in Literature*.¹⁻⁵¹ But among these 51 cases are included 2 (Nos. 40 and 51) which were simple serous effusions, and both of these recovered. In this paper he makes the following observations:

"Of the total 51 cases of incision for pericarditis, 20 recovered and 31 died—a mortality for all cases of 60.5 per cent.

"Of the 14 cases in which acute pneumonia, either lobar, bronchial, or septic, was the cause of the pericarditis, only 4 recovered (Bohm,³⁰ Lilienthal,⁴¹ Porter,⁵⁰ and Bjorkmann³⁹). In 2 of these the pneumococcus was cultivated from the pus. The other two report no bacteriological examination."

Of the above 51 cases, 5 have been recorded in the *BRITISH MEDICAL JOURNAL*: West, 1883;⁴ Davidson (2 cases), 1891;^{17, 18} Bronner, 1891;¹⁹ Robinson, 1898.⁴³

The case recorded below differs in many respects from any of those previously published. That described in this *JOURNAL* in 1891 by Bronner presented the nearest resemblance clinically, though unfortunately in his case no necropsy was permitted, and so the exact state of the organs was never determined.

The case here published I saw several times in consultation, first with Dr. D. Wilson of Bushey Heath, and then with Dr. Levick of Pinner. I have to thank those gentlemen for their kind assistance with these notes.

History and State on Examination.

The patient was a healthy public school boy, aged 16, whose father had died at 33 from phthisis. His mother was living and well, but she had lost a sister at 21 after amputation of the leg for disease of the knee-joint. A brother older and a sister younger were both living and well. The patient had no previous history of serious illness. The attack commenced at school on December 7th, 1902, when he complained of a stiff neck and sore throat. He was seen by Dr. Wilson the next day, and found to have some general injection of the fauces, suggestive of a commencing tonsillitis. There was some elevation of temperature and he was kept in bed. On December 10th he was more feverish, and there was a slight dry cough, but the throat was better. During the next day or two there were some apparently superficial *râles* to be heard, at one time over the region of the right nipple, and at another in the left axillary region. The temperature on one occasion was 105° F.

On December 12th the boy presented many of the signs of a case of pneumonia of an infectious type. The pulse was 150 or more; respirations 50 to 60, very short, shallow, and catchy; slight dry cough, great restlessness; temperature about 103°. The patient appeared very ill for the physical signs, which consisted only of some large pleuritic *râles* heard just outside the left nipple region, with some impairment of percussion note over the base of the left lung. The heart sounds were indistinct, but no *bruit* was heard.

On December 13th he was obviously worse—the pleuritic *râles* over the left side were less distinct, and the dullness slightly more marked; with a very

small area of tubular breathing, and some slightly suspicious signs at the right base; cough very slight; no expectoration. He also complained of pain in the epigastric region, and there was some fullness, tenderness and great tenderness there. The heart's action was greatly excited and the sounds more indistinct—no *bruit*. There was considerable blueness over the malar regions.

He kept about the same till December 15th, when the temperature fell to normal but unaccompanied by sweating; the pulse improved, slowing to 104, but the respirations continued about 48, and there was an absence of any marked general improvement. The temperature remained normal for about twelve hours and then rose to 99.8°, falling to normal again shortly after, and again rising slightly the following evening. This condition continued for the next few days. All the pulmonary signs rapidly cleared up, but there appeared to be an increasing area of cardiac dullness, and the heart sounds became less distinct; the apex beat could not be felt.

On December 23rd, there being no great change in his condition, he was put into a fly and driven to his home, about an hour's drive, being kept all the time in the recumbent position. He then came under the care of Dr. Levick. During the next few days he appeared to improve a little in himself, but the heart's action kept rapid and feeble all the time, and he presently became gradually worse.

On December 30th he appeared very ill; the pulse was running, irregular, and very feeble. The respirations were greatly embarrassed, with marked expiratory distress. All the symptoms were greatly aggravated on placing the patient on his back for the purpose of examination, which could therefore only be done rapidly and not very satisfactorily. There was great restlessness; he was perpetually asking to be moved from side to side, being too weak to move even his hands or arms himself; the extremities were cold, and the cheeks and ears very cyanosed.

The cardiac dullness had greatly increased both upwards and outwards, the heart sounds were hardly audible, but obviously much more (probably twice) rapid than the pulse at the wrist (*pulsus paradoxus*). There was no dullness over the bases of the lungs or adventitious sounds heard. The spleen was felt below the ribs, and appeared to be displaced downwards, and slightly enlarged. There was no oedema of the legs or elsewhere.

On December 31st, during the morning, the patient had an alarming attack of heart failure, and for a time he was practically pulseless. The temperature for some hours had been subnormal, and the boy appeared to be collapsed, with the extremities blue and cold. Strychnine hypodermically was administered and he rallied a little.

First Operation.

In the afternoon an anaesthetic was administered by Mr. Rowell, and Mr. Lane inserted an exploring needle into the area of precordial dullness and found pus, a piece of rib was eventually resected, and a local empyema was evacuated. This pus was afterwards examined, and found to contain the pneumococcus in considerable numbers, and was apparently unmixt with other organisms. No tubercle bacilli were found.

Although somewhat relieved by the opening of the left pleura and free discharge of pus, still the pulse continued rapid and unsatisfactory, the respirations were just as rapid but somewhat deeper, the temperature remained elevated, and only fell to the normal for a very short time on two occasions during the next ten days, after which all the symptoms became more alarming, and the temperature rose to 103.6°. A second operation was decided upon, as the symptoms pointed to a further collection of pus.

Second Operation.

An anaesthetic was again administered by Mr. Rowell, and Mr. Lane inserted his finger into the opening in the chest wall, and now felt the pericardium bulging against it, and evidently distended with fluid. By the exercise of firm pressure the finger was forced through the wall of the pericardium and a large quantity (about 10 ounces) of pus escaped into the pleural cavity and externally. The heart was felt to occupy the back part of the dilated pericardial space, being forced away from the sternum by the fluid which distended the pericardium. The pus was identical in character with that in the empyema, no flakes were present, and the surface of the heart was smooth and not covered by lymph.

After-History.

The next day, January 11th, the temperature fell at one time to normal, and the pulse was fuller and slower than it had been for many days. After the second operation he was given a mixture containing opium and digitalis.

January 14th. Temperature each day since the last operation had dropped at some time to the normal, and the subsequent rise had each day been less marked. The appetite was bad, but otherwise the condition was satisfactory.

The opening in the thorax had enlarged, owing partly to a general bulging of this side of the chest wall, which presented a large air cavity extending from beyond the right edge of the sternum; and partly to the emaciation and consequent retraction of the intercostal spaces, with the result that there was now some 1 in. of rib exposed anteriorly. The lung was expanding satisfactorily, and as the boy lay on his back one could look into the opening in the chest wall and through the foramen, about 1 in. in diameter, into the pericardium, at the posterior part of which the heart was seen beating vigorously; the surface of the heart and pericardium was dry and of a pale mahogany colour, and there did not appear to be any fluid in the pericardium. There was a small slough attached to the edges of the pericardial opening, but beyond this the parts appeared perfectly healthy. The action of the heart was at once considerably agitated on removing the dressings and allowing more air

to enter the pericardial sac. It was therefore decided only to change the dressings once a day, and then as rapidly as possible. The tube was also left out.

January 17th. The temperature during the last three or four days had been very irregular. In the morning it would be not more than 96°, and in the evening over 101°. The respirations and pulse had kept about the same.

January 18th. There was some recovery of strength in the legs and arms, the appetite was slightly better, so also the general colour. The respirations were deeper. Lying on the left side, little or no air entered through the opening in the thorax—the curious hollow, metallic heart sounds could be distinctly heard some 4 or 5 ft. away from the bed—"resonance sounds." By slightly raising his shoulders, and turning him more on to his back, air entered the opening freely, and the metallic cardiac sounds completely disappeared.

January 20th. Urine, specific gravity 1025, acid, very high-coloured, with large deposits of dark-brownish lithates. No albumen or sugar was present. Patient for first time during his illness was perspiring freely, and was obviously weaker. The temperature the last four days had varied between 99.4° and 102°.

January 21st. Condition this morning was very critical. Upper region of abdomen was distended. A finger was inserted into the opening. An hour or two afterwards a large quantity of pus escaped from the wound, and the fullness in the epigastric region diminished. The lung had expanded very completely, and now came up to the external opening in the chest wall, and covered over the foramen in the pericardium. The pleural cavity had filled with blood-stained serum, a large quantity of which escaped with each movement of respiration. During the afternoon the diaphragm did not appear to be acting, and the liver dullness was increased downwards, the boy was perspiring profusely, and the pulse was very weak.

The blood-stained serum continued to escape freely, and the patient became more blanched. He became suddenly worse, and died at 6 o'clock the next morning, January 22nd. His mind kept perfectly clear to the very last. The temperature a few minutes before death was over 100° F., and a small quantity of recent blood clot escaped from the wound. That at the time of death the temperature was raised was somewhat remarkable, as there was internal haemorrhage of a considerable degree going on; in fact the necropsy showed that the loss of blood appeared to have been the immediate cause of death.

NOTE ON THE OPERATION BY MR. LANE.

On December 31st I proceeded to remove a portion of the sixth left rib about an inch outside the nipple line, sufficiently long to allow of the free introduction of the finger into the suppurating cavity. About two pints or more of creamy pus escaped, containing no flakes or masses, and presenting all the characters of that produced by the pneumococcus. The diaphragm could be felt at its attachment to the ribs, while above and behind the shrunken lung could be touched at the extreme limit of the space.

As the rapidity of the pulse and the general condition of the patient had suggested the presence of pus in the pericardium, this region was carefully examined with the object of detecting fluctuation in it. Though the finger could reach the middle line, the pericardium could not be felt, nor could the pulsations of the heart be detected. This led to the hope that the pericardium had not been affected, and that the conditions suggesting the presence of pus in it were due to the great displacement of the organ. A large short tube was fixed in position, and the wound was dressed with cyanide gauze and some antiseptic wool. The dressings were changed twice daily, and the part was rendered as clean as circumstances permitted. The patient was kept as much as possible on his left side to permit of free drainage.

It would seem from the sequel of the case that though there was probably pus in the pericardium at this period it existed only in a small quantity, since the heart was displaced considerably to the right of the middle line; and that the bulk of the amount evacuated later formed subsequent to this operation.

In a paper in the *Guy's Hospital Reports for 1882* entitled *Cases of Empyema in Children treated by Removal of a Portion of a Rib*, in which I described, for the first time, the operative treatment of empyema by the resection of a length of a rib, which I had devised and practised successfully, is related the history of a case of purulent pericarditis associated with empyema on the left side, the details of which were very similar to those presented by the patient forming the subject of this paper. In it I called attention to the facility with which this operation, now performed as a routine practice, afforded for careful digital examination of the pericardium and the detection of pus in it, and the drainage of the cavity.

NOTES ON THE ANAESTHETIC BY MR. ROWELL.

December 31st. The patient was in great distress. The respirations were short and rapid, with constant expiratory straining due to muscular contraction at and above the

glottis causing obstruction. There was also much terror of the anaesthetic, though he did his best to breathe as instructed. Pulse uncountable, pupils dilated, marked cyanosis. He was placed on the right (sound) side, as breathing was less difficult in that position than when on his back. A.C.E. mixture on a Skinner's mask was used for the first two or three minutes, as he could only keep the breathing efficient with a very mild vapour. There was constant moaning until, at the end of this time, a Rendle's mask was employed with a drachm of the mixture on the sponge. He was then rapidly relaxed, moaning ceased, the colour slightly improved, expiratory straining much diminished, but there was slight inspiratory stertor. From this time until the end ether was given upon the sponge of the Rendle's mask in frequent small quantities, and the symptoms scarcely varied. He had m.v of liq. strychn. hypodermically while the exploration with the syringe was proceeding. The corneal reflex was strong throughout, pupils rather large, globes not quite stationary. A slight movement of the limbs occurred while the resection of the rib was proceeding. He recovered consciousness in a few minutes, although the duration of the administration had been about twenty minutes. There were no after-effects.

On January 10th his condition as regards colour, pulse, and apparent strength was rather better than on the former occasion, but there was a still greater terror of the anaesthetic, and the patient said that he knew he should not live through the operation. He nevertheless made every effort to take it as directed. The position and method employed were the same as before, and the same symptoms were encountered. There was no change when the pericardium was opened. Duration shorter than before, and recovery equally rapid, with no after-sickness.

NECROPSY.

The body was extremely emaciated and the surface blanched. On opening the thorax, the pericardium and left pleural cavity were found to contain a large quantity of recent blood clot. About two ounces were in the pericardium, and this extended through the foramen into the pleural cavity, which contained about ten ounces. The clot was most abundant about the base of the heart, especially in relation to the right auricle. With the naked eye it was impossible to be certain of the source of the haemorrhage.

The right lung appeared to be normal, with some slight recent pleuritic adhesions towards the median line posteriorly. The left lung was firmly adherent over the whole of the posterior part and also to the pericardium; the whole of the free anterior and lateral surface was covered by a thick deposit of firmly-adherent lymph, which extended over both surfaces of the pericardium and produced considerable irregular thickening of this membrane. The edges of the connecting foramen between the pleural and pericardial cavity were healthy. With the exception of the extreme apex and the median area adherent to the pericardium, the lung was well expanded, vesicular and healthy, only a little frothy fluid escaped when it was cut into. The apex and median adherent parts were solid. No tubercle or other deposits were seen with the naked eye, nor was any further collection of pus found.

The whole surface of the heart was also covered by a thick deposit of firmly adherent lymph. The size of the heart was about normal, there were a few very vascular adhesions posteriorly, connecting the right ventricle with the pericardium. The muscular walls of the heart were rather soft, especially parts of the right auricle, which appeared much degenerated in places, and these walls readily tore when handled. There was some slight deposit of pale fibrin between some of the pectinate processes, but no obvious deposit on the free surface of any of the valves, nor did these show any morbid changes, to the naked eye.

The large intestine, especially the transverse colon, was distended by flatus, otherwise the abdominal organs revealed no gross lesion, nor was there any fluid in the peritoneal cavity.

MICROSCOPICAL AND BACTERIOLOGICAL REPORT.

Sections through the wall of the right auricle stained by Gram's method, and also with haematoxylin and eosin, showed the pericardium to be covered by bosses and tags of adherent lymph, and the latter was crowded with micrococci, which existed in dense patches and rows throughout the connective tissue layer of the pericardium. In places the cocci were arranged in oval masses, appearing as emboli. The areolar tissue superficial to the myocardium was infiltrated by leucocytes. The myocardium showed hyaline degeneration of the muscle fibres. In places there was a good deal of round-celled infiltration amongst the muscle fibres, and in other places the fibres had undergone necrosis, and fibroblasts had begun to take their place. The fibres were in some areas separated by swollen oedematous connective tissue containing leucocytes and distended vessels. In the musculi pectinati the hyaline degeneration was less marked, but the fibres cut across were very granular. The endocardium was swollen, and its connective tissue reduced in places by oedema to a delicate reticulum. In the meshes of this network numerous cocci were present, but no dense masses existed in the endocardium, such as were seen in the areolar tissue of the pericardium. In the interstices between the pectinate bundles there were strands of fibrin containing cocci. No fully-formed abscesses existed in the section examined, but the masses of cocci surrounded by areas of necrosis found in the sub-pericardial tissue were evidence of abscess formation.

In many places the diplococci arrangement was very well shown, and in many the capsule was very distinct, together with a clear unstained area around the cocci. There was also a marked tendency for them to occur in small chains. No other organisms were present.

Sections through the collapsed lung with Ziel-Nielsen stain showed the pleura to be considerably thickened; the thickening consisted of fibroblasts and round-celled infiltration. There was proliferation of the endothelial cells covering the pleura. The lung showed some thickening of alveolar septa in places and a good deal of desquamation of alveolar epithelium. The whole section was crowded with cocci, which were both intracellular and extracellular. There were large numbers in the endothelial cells lining the pleura and many in the cells of the alveolar epithelium. In the greater part they appeared as diplococci and in many cases showed a distinct capsule, in some places they had taken on the methylene blue and in others the fuchsine staining. They were undoubtedly the pneumococcus of Fraenkel, and there was no evidence of any other organism present. With Gram and eosin the cocci took the stain, but the capsules were not so distinctly shown.

SUMMARY OF CASE AND REMARKS.

The case may be briefly summarized thus: A healthy lad of 16 developed a sore throat which in a day or two was followed by most of the symptoms, but without very distinct physical signs, of pneumonia of the left base. On the eighth day after the onset of the attack an apparent crisis occurred. In a few hours the temperature again rose slightly, falling to the normal the following morning, to rise again in the evening for the next three days. Then came a period of five days with the temperature generally raised and with some slight increase of all the symptoms. For the next eight days the temperature was usually markedly subnormal, and during this time there existed the pulsus paradoxus. At no time was either an endocardial or exocardial murmur heard. A left empyema was then opened, but without the relief to the general symptoms which had been expected. The pulse, however, became much more regular and of better volume, and, as far as could be determined, of the same rate as the heart's beat. Ten days afterwards the pericardium was opened, but with only a slight temporary general improvement, soon followed by a more irregular temperature. The patient died thirteen days after the pericardium had been opened, and twenty-three days after the operation on the pleura. The immediate cause of death appeared to be the result of internal haemorrhage from the heart, due to rupture of one or more small abscesses in its walls. The bacteriological examination proved the presence of pneumococci in great numbers in the blood, death being the result of a general pyæmia, due to the pneumococcus.

Judging from the immediate result of the opening of the pericardium and the subsequent course of events, had there not been a general pyæmic infection, there was no reason why the case should not have recovered.

Many authorities have described the very unusual and peculiar heart sounds heard in cases of pneumo-pericardium with and without the presence of fluid. In the case here described, commencing immediately after the second operation as pneumothorax and pyopneumo-pericardium; after the first few hours of opening the pericardium it became a condition of pneumothorax accompanied by pneumo-pericardium. The following are the classical descriptions of the sounds heard under these conditions: Brichtean, "*l'eau agitée par la roue d'un moulin*," or "a water wheel sound"; Laënnec "*bruit de fluctuation*," or fluctuation sound, audible with the action of the heart: Begbie, "a churning splash"; Stokes, "a mixture of various attrition murmurs with a large crepitating and gurgling sound, while to all these phenomena are added a distinct metallic character, the region of the heart giving a '*bruit de pot fêlé*' on percussion."

From the heart sounds heard in this case, after the pericardium had been opened, I should describe them as accompanied by a peculiar loud metallic resonance, such as reminded one of the resonance accompanying sounds in a small cave. In this condition (due no doubt to the very large air cavity filling the pericardium and left pleura, and extending from well over the right edge of the sternum) the heart sounds were so increased by resonance that when the patient lay on the left side, so as to press the dressings firmly over the opening in the thorax and prevent the entrance and exit of external air, the heart beats could be heard very distinctly some 4 or 5 ft. away from the bed. Upon slightly turning the patient more on to his back, or by raising the shoulders, in either case allowing the entrance and exit of air through the wound, the heart sounds could no longer be heard away from the patient, and also lost their metallic resonance character.

Date.	Temperature.	Pulse.	Respiration.	Notes.
1902.				
Dec. 11	M., 103.0° E., 104.2°	— —	— —	
" 12	M., 101.6° E., 103.2°	158 128	64 64	
" 13	M., 101.4° E., 102.6°	128 120	64 54	
" 14	M., 101.4° E., 101.2°	122 122	52 52	
" 15	M., 98.6° E., 99.8°	112 104	48 48	Crisis.
" 16	M., 97.8° E., 99.8°	112 100	44 48	
" 17	M., 98.6° E., 99.2°	104 104	40 44	
" 18	M., 98.0° E., 99.4°	144 100	30 36	
" 19	M., 100.0° E., 101.6°	108 110	48 48	
" 20	M., 100.0° E., 101.2°	68 112	30 48	
" 21	M., 99.4° E., 100.0°	108 84	40 40	
" 22	M., 99.8° E., 100.2°	100 80	44 48	
" 23	M., 98.8° E., 99.4°	112 —	48 —	Removed home.
" 24	M., 97.4° E., 96.6°	68 —	40 —	
" 25	M., 97.0° E., 97.4°	88 78	44 36	
" 26	M., 97.8° E., 99.2°	60 68	42 42	
" 27	M., 97.6° E., 98.0°	68 78	42 46	
" 28	M., 97.4° E., 98.8°	76 60	40 44	
" 29	M., 97.2° E., 98.2°	84 68	46 40	
" 30	M., 97.4° E., 98.2°	80 73	44 44	
" 31	M., 97.0° E., 99.6°	78 100	44 48	Pleura opened.
1903.				
Jan. 1	M., 99.2° E., 99.8°	116 124	52 54	
" 2	M., 99.2° E., 101.0°	120 120	48 52	
" 3	M., 99.6° E., 99.6°	122 120	48 48	
" 4	M., 98.2° E., 101.6°	116 128	48 52	
" 5	M., 99.4° E., 99.8°	120 120	32 48	
" 6	M., 101.2° E., 101.2°	118 112	48 48	
" 7	M., 97.6° E., 101.2°	120 120	48 52	
" 8	M., 100.4° E., 102.0°	116 120	60 52	
" 9	M., 100.8° E., 103.2°	128 126	36 58	
" 10	M., 102.8° E., 103.0°	130 120	52 52	Pericardium opened.
" 11	M., 99.8° E., 101.4°	114 106	38 30	
" 12	M., 100.4° E., 100.8°	116 120	44 44	
" 13	M., 99.2° E., 100.6°	116 122	24 46	
" 14	M., 96.2° E., 99.2°	116 116	20 44	
" 15	M., 96.4° E., 100.2°	110 106	35 48	
" 16	M., 95.2° E., 100.8°	108 120	30 42	
" 17	M., 99.8° E., 101.2°	122 122	32 48	
" 18	M., 98.4° E., 100.4°	110 110	38 38	
" 19	M., 100.2° E., 102.6°	112 112	37 42	
" 20	M., 100.0° E., 102.8°	116 120	38 48	
" 21	M., 103.0° E., 100.4°	124 120	42 52	
" 22	M., 100.2°	—	—	Death.

Since the publication of C. B. Porter's paper in 1900 I have found the following cases recorded:

Reichard (2 cases operated on by Lindner) *Centralbl. f. Chir.*, 1900, No. 44. In the first case, which resulted from a knife stab, the third left rib was resected and two tubes were inserted—the operation took ten minutes—patient was well in six weeks.

In the second case, which followed an attack of influenza and arthritic rheumatism, the fourth rib was resected; recovery was prolonged as the drainage was never satisfactory, and some time after a note was made to the effect that the heart's action was still somewhat quick.

R. Sievers, Fall of pneumopyo-pericardium. [*Fineke's handl.* Helsingfors: 1901, xliii.

Villemin, Un cas de péricardite purulente traité par l'incision du péricarde. *Ann. de Méd. et Chir. Infant.* Paris: 1901.

Devaux, Pleurésie putride, péricardite putride, pleurotomie, mort. *J. o. Sc. Méd. de Lille*, 1901, xxiv.

On going through all the recorded cases of purulent pericarditis operated on, there does not appear to have been one in which tubercle was the cause of the condition, a fact certainly worth noting.

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CASE OF INFECTIVE ENDOCARDITIS SUCCESSFULLY TREATED BY RECTAL INJECTIONS OF ANTISTREPTOCOCCUS SERUM.*

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A. R., aged 15, printer's boy, admitted into Matthew Ward, St. Bartholomew's Hospital, April 9th, 1902.

History.—He felt ill two days previously, and had a rigor on each day. He had pains all over the body, and a rash appeared on the trunk and limbs. There was no history of growing pains, rheumatism, or chorea. The family history was unimportant, but the father was believed to have suffered from rheumatism.

State on Examination.—The boy was anaemic, very feeble, and ill, movements were painful, and caused dyspnoea. He was sparsely nourished, fair-haired, with grey eyes. Pupils large, reacting well, conjunctivae suffused, tongue thickly furred. Teeth fairly good. Fauces red and congested, tonsils large and engorged. The pulse was full and soft. The temperature was 98.8° F. on admission, but rose in six hours to 103.8°, when he had a rigor. There was a septic scab on the right elbow, the result of a recent injury. On the limbs and abdomen were several raised red spots of various sizes which closely resembled patches of erythema multiforme or erythema nodosum. The lungs were free from disease, and the thorax moved well. The liver was of normal dimensions, and the spleen impalpable. The heart's apex beat was inside the nipple line, with increased impulse. A systolic murmur was audible at the apex, heard all over the precordia, and the second sound was muffled. The urine was of specific gravity 1016 and free from albumen and sugar. Knee-jerks natural. Rigors occurred on April 11th and 12th, and on the latter date a fresh eruption of erythema. On the 14th an eruption of herpes appeared on the left cheek. On the 15th there was another rigor, with temperature of 104.8°. On the 17th Widal reaction was negative. For some days afterwards there were rigors daily and occasional fresh eruptions, some with petechial haemorrhages, and some on the hands, vesicular, and there was vomiting at intervals. Between the febrile attacks the boy felt well and took his food with relish.

During the attacks there was headache, with more rapid respirations and some huskiness of the voice.

Serum Treatment and Progress.—April 30th. Treatment with fresh yeast was begun, two or three tablespoonfuls being given in water twice or thrice daily. Hitherto, salicylate of sodium, quinine, and calomel had been given with no benefit, and a light diet with fish. Ten c.cm. of antistreptococcus serum, prepared from mixed cultures, were injected into the left flank. This was repeated on May 4th. Pains in the limbs were again felt. No improvement appeared to follow these injections, and the temperature rose daily in flights to 102°, 103°, and 105°. May 11th. Slight rigor. Temperature, 104.2°. May 12th. Conjunctivitis of left eye with ecchymosis, and swelling in the left ankle-joint. Occasional fresh outbreaks of eruption. Patient still feeling well in the intervals of fever, and eating well. Oil of gaultheria in π xx doses relieved the pain in the ankle. A blood count showed 4,000,000 red globules, and 55 per cent. of haemoglobin, colour index 0.68, and a culture of it proved negative of any organisms. May 22nd. The pyrexia continued, with falls to 97° and normal daily. The yeast was taken daily. Effusion was now found in the left knee. A cultivation of the fluid in it proved negative. A presystolic murmur was now observed, and a systolic murmur followed it. A soft souffle was also heard in the aortic area, and in the pulmonary arterial area, the second sound being clear. May 27th. Some pains in the left shoulder-joint. June 1st. No more rigors, but daily flights of temperature, 103° or 104° with remissions to normal or below this. The patient was gradually losing strength and appetite and was very ill. Fresh spots came out at intervals, and pains occurred in various joints and other situations. It was now decided to employ mixed antistreptococcus serum by means of rectal injections, 10 c.cm. to be given daily. In two days there was improvement, and this was more decided in the course of a week. The temperature had not exceeded 101.2° since this treatment was begun, there was less pain and no further outbursts of spots. The appetite improved markedly, and the boy said he felt quite well. The yeast treatment was continued together with the serum injections. From this time the improvement steadily continued. The cardiac murmur altered somewhat, the systolic murmur remaining, but not being heard at the scapular angle. The blood count on July 17th, was 6,260,000 reds, 8,000 white, 57 per cent. haemoglobin, and the colour index 0.45. There was no further rash, and there was improvement in the general nutrition. The pyrexia was subdued within two weeks after the rectal injections. By the end of June the temperature had become fairly normal. The serum treatment was maintained well into July, long after the febrile condition had abated. The boy was sent to the country for three weeks, and returned in excellent health. He was taken away from London and set to work in a farm in the country. The heart sounds were found to be normal in September, and the boy was in the best of health. The first diagnosis in this case was that of a severe form of erythema multiforme associated with rheumatic infection, and the cardiac condition tended to confirm this opinion. In spite of appropriate treatment, the boy grew worse, and the pyrexia became very severe, accompanied with rigors at irregular intervals. The changes in the cardiac sounds indicated an active endocarditis, and led to the belief that this was of an infective nature. It was doubtful if the small septic wound on the arm was the true source of the illness. Yeast was employed in view of the septicaemia, and I am not disposed to regard its influence as unworthy of serious consideration. But certainly no good effects were apparent before the use of regular doses of antistreptococcus serum by the rectum. The boy was manifestly losing ground steadily before this treatment was begun, and the daily improvement afterwards was very certain and remarkable. It was satisfactory to note the perfect recovery which was maintained for some months, and to find that the cardiac condition had completely passed away and left no signs of mischief. This case may be taken to illustrate the effects of a specially virulent quality or variety of the specific infecting microbe which commonly induces ordinary rheumatic symptoms, and may add support to the view of Drs. Poynton and Paine that infective endocarditis may sometimes be a primary affection due to a virulent form of the peccant matter of rheumatism.

A BED in St. George's Hospital has been endowed by the members of the Bachelors' Club in memory of twenty-eight members who were killed or died of wounds or disease in the South African war, 1900-1902.

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