Summary

Seven cases of gonorrhoea (six males and one female), of which six were uncomplicated and one was complicated by Cowperitis, have been treated with single intramuscular injections of 0.2–0.6 g. of streptomycin in an aqueous medium. In all cases the initial response was at least as dramatic as treatment with penicillin in watery or oil-wax media. One patient, given 0.6 g., apparently relapsed after three days, but was successfully re-treated with the same dose of the drug. Another, complicated by Cowperitis, received only 0.2 g., and after a satisfactory initial response relapsed two days later with abscess formation in the gland and was then treated successfully with penicillin.

One patient with dark-field positive primary syphilis was given a single intramuscular injection of 0.6 g. of streptomycin, and twenty-four hours later *T. pallidum* was still recoverable without difficulty from the dark-field.

Apart from possible mild cerebral effects in Case 1, and mild pain at the site of injection in Case 2, no toxic effects were recorded.

It is concluded that streptomycin will be of the greatest value in venereology for all cases of gonorrhoea in which syphilis is more than usually suspect. As it appears that its use may not mask an incubating syphilitic infection, it is probable that only a three-months post-treatment period of surveillance to exclude syphilis will prove necessary for gonorrhoea treated with streptomycin, as compared with the six months usual after treatment with penicillin.

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LARYNGEAL PARALYSIS ASSOCIATED
WITH CARDIAC HYPERTROPHY

REPORT OF FOUR CASES

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The association of laryngeal paralysis with aneurysm of the aortic arch is well known. That the left recurrent laryngeal nerve may be damaged in cases of cardiac enlargement is, however, less well recognized. The paralysis usually occurs in association with mitral stenosis, but recently some instances have been recorded of vocal-cord palsy in cases of hypertension with cardiac failure. The present communication is based on four cases of laryngeal paralysis attributable to a coexisting cardiac lesion.

Case Reports

Case 1.—A woman aged 26 was examined in consultation with Dr. James Richard on account of huskiness of a few months' duration. Laryngoscopy revealed complete abductor paralysis of the left vocal cord. The physical signs in the chest were those of cardiac enlargement and mitral stenosis with incompetence. The apex beat was 4 in. (10 cm.) from the midline, and the right border of dullness was at the right border of the sternum. There was slight oedema of the ankles. Her compensation was fairly good for a quiet life but failed on any exertion. Since the age of 19 she had been troubled with dyspnoea on exertion, palpitations, and oedema of the ankles. At the age of 7 she had had chorea followed by subacute rheumatism, at 10 peliosis rheumatica, at 14 tonsillitis, and at 19 subacute rheumatism.

Case 2.—A woman aged 51 was admitted to Dr. George Allan's wards in the Western Infirmary complaining of breathlessness and insomnia for three weeks and also of pain in the left leg and foot. During the previous two years her health had been poor—she was easily fatigued and had slight breathlessness. There was no history of rheumatism or other major illness. The lips and cheeks were cyanosed and there was considerable dyspnoea, which was increased even by speaking. The voice was hoarse. Both ankles were oedematous, the left one being tense and tender. The cardiac rhythm was regular at 150 and the pulse was of poor volume and tension. The blood pressure was 135/100. The arteries were not palpable. The apex beat was diffuse and visible and most forcible to palpation in the sixth interspace at 5½ in. (13.3 cm.) from the mid-sternal line. The borders of cardiac dullness were at the third rib, the mid-sternal line, and 5½ in. from the mid-sternal line. A loud musical murmur replaced the first cardiac sound and was conducted all over the praecordium and into the axilla. The second pulmonic sound was markedly accentuated. Laryngoscopy revealed complete paralysis of the left vocal cord. Examination of the fundi revealed slight arteriosclerotic changes. The patient died three weeks after admission. Permission for necropsy was not obtained.

Case 3.—A married woman aged 53 was admitted on May 19, 1933, to the Western Infirmary suffering from severe abdominal and left thoracic pain, tachycardia, and slight jaundice. She had had cholecystectomy for gall-stones in June, 1932, but had had recurrent attacks of jaundice during the following winter. The tachycardia was ascribed to auricular flutter, which with digitalis changed to auricular fibrillation and ultimately to regular rhythm. There was no material improvement, pain persisted, and she succumbed to hypostatic pneumonia on July 9. Paralysis of the left vocal cord was observed on laryngoscopy on June 27. The necropsy findings were as follows. The heart weighed 12 oz. (340 g.). The pericardium was healthy and the left ventricle was of normal size. The left auricle was markedly dilated, as were to a lesser extent both chambers of the right heart. The mitral valve was stenosed, being 7/10 in. (1.78 cm.) in diameter. The tricuspid

and arterial valves were healthy and of normal dimensions. The myocardium was somewhat fibrosed. The divided ends of the large vessels were tied off and the heart filled with water. It was noted that the left auricle did not actually impinge on the left recurrent laryngeal nerve, which showed a constriction at the point where, having left the vagus, it passed between the left pulmonary artery and the arch of the aorta. The nerve at the affected point was flattened and much attenuated.

Case 4.—A man aged 34 was seen in consultation with Dr. R. G. Lendrum at the medical dispensary of the Western Infirmary. Five weeks previously his voice had become suddenly weak, and there had been some precordial pain. There was considerable cardiac enlargement, with signs of mitral stenosis, but no dyspnoea or oedema. The patient had had several attacks of rheumatic fever. Laryngoscopy showed paralysis of the left vocal cord.

Discussion

Before discussing the mechanism of production of the paralysis, the relations of the structures involved require consideration. The left recurrent laryngeal nerve arises from the vagus to the left of the aortic arch on a level with its lower border. The nerve winds below the arch immediately behind the attachment of the ligamentum arteriosum to the concavity of the arch, and ascends to the side of the trachea. The ligamentum arteriosum, the fibrous cord which remains from the closure of the foetal ductus arteriosus, extends from the upper aspect of the root of the left pulmonary artery to the aorta. The relations of the left auricle, pulmonary artery, and aortic arch are shown in the accompanying diagram.

Ortner (1897) advanced the theory that distension of the left auricle produced paralysis by direct pressure on the nerve, and considered that it was supported by the evidence of necropsy in his two cases. Enormous dilatation of the left auricle was found, great enough to produce pressure on the aortic arch and to squeeze the recurrent nerve where it wound beneath the arch. The nerve was completely flattened and atrophied.

Kraus (1900) encountered a necropsy where this theory appeared to be inapplicable. The heart was well compensated, and dilatation of the auricle was insufficient to exert direct pressure on the nerve. He suggested the following explanation. In a well-compensated mitral lesion in which considerable hypertrophy of cardiac musculature has taken place the heart comes to lie more horizontally with its right border on the diaphragm. In such a case the normal "bascul" or seesaw action is exaggerated. It is thought

that, during systole, traction on the pulmonary artery is forcible enough to pull on the aortic arch through the medium of the ligamentum arteriosum, thereby stretching the recurrent nerve.

Fetterolf and Norris (1911), however, have thrown doubt on the probability of that explanation. They point out that the ligamentum arteriosum runs more or less horizontally, that the arch is supported at both ends, and that it is slung up by its attachment to the cervical fascia. They maintain from their studies of formalin-hardened sections of the thorax that dilatation of the auricle acts indirectly by forcing upwards and backwards the pulmonary artery, which itself is often dilated.

King, Hitzig, and Fishberg (1934) reported three cases of hypertension and arteriosclerotic heart disease with failure of the left ventricle. Coronary thrombosis had occurred in two of the cases, and in all three the left recurrent nerve had been paralysed. They regard the dilatation of the pulmonary artery produced by the engorgement of the lesser circulation as the cause of the compression of the nerve against the arch of the aorta and the ligamentum arteriosum. They conclude that the hypertension in the lesser circulation is an important factor in the production of laryngeal paralysis complicating mitral lesions. The evidence available at necropsy in one of our cases lends support to this explanation, which appears to be the most probable one. Hypertension in the pulmonary artery is a constant feature in mitral lesions before failure of the lesser circulation has occurred, whereas, according to the findings in the limited number of necropsies which have been performed in these cases, the relation of the dilated left auricle or its appendage to the recurrent nerve is very variable.

To judge from the literature, the syndrome is infrequently encountered, and it is to be noted that many of the recorded cases have not been substantiated by necropsy. Since attention was first drawn to it by Ortner in 1897 about 80 cases have been recorded. Osler (1905), however, had seen only two instances and referred to the possibility of confusing aortic aneurysm with mitral stenosis when vocal-cord paralysis also exists. In the systematic examination of 20 cases of mitral disease Ceraulo (1907) found the left vocal cord paralysed in four. Garland and White (1920) reported nine cases collected from the records of the Massachusetts General Hospital during a period of eight years. In a series of 50 cases of advanced cardiac disease with hypertrophy we encountered two with associated laryngeal palsy (Cases 2 and 3), and it therefore seems probable that the condition occurs more often than is suggested by the scarcity of recorded cases.

I wish to acknowledge my indebtedness to my medical colleagues for clinical notes and for the opportunity of examining cases in their wards.

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Occupation centres provide for mentally defective children unable to attend school because they are incapable of receiving education there. Local authorities have recently been asked to submit plans for the training of defectives at home and in the centres, and the National Association for Mental Health has recently published an interesting survey entitled "Occupation Centres for Mentally Defective Children" which may serve as a guide to the problem. Detailed information, as well as the pamphlet (price 9d.), may be obtained from the National Association at Maurice Craig House, 39, Queen Anne Street, London, W.1.