or fresh infection of the other lung, they have done on the whole badly.

4. In 17 patients there has been no good result.

5. Of the whole number 21 patients are now dead.

These results have been obtained in patients who were all seriously ill and becoming worse. There has been no selection of cases for statistical purposes.

Dr. Niehans, who has charge of the Basle Heilstätte at Davos, has performed this operation according to Brauer's method 24 times.

In 7 cases he did not succeed in producing a pneumothorax.

Of the remaining 17, 1 died nine months later of hæmorrhage from an incompressible cavity.

Seven are fit for or at work.

Nine are still under treatment, and the prognosis in these cases is described as good.

A NOTE UPON THE MECHANICAL EFFECTS OF A MASSIVE LEFT-SIDED PLEURAL EFFUSION.

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THE following case is the third of a series illustrating the effects of a pleural effusion in producing displacements of the thoracic and abdominal viscera, which have been prepared in and described from this department. The two previous ones (1 and 2) have dealt with right-sided pleural effusion. In this case the left side was affected and the study of it is therefore complementary to that of the other two.

The subject was a male aged 69 years. The tissues had been preserved by the injection of a solution of 15 per cent. formalin, the form and relations of the viscera being thereby accurately retained.

The accompanying photograph was taken after removing the anterior thoracic wall and sectioning in a coronal plane the contained structures from the level of the innominate vein to the upper surface of the liver, the diaphragm being thus included in the section.

OBSERVATIONS.

The Thoracic Viscera.

1. The capacity of the left pleural cavity is greatly increased and its walls are covered by a thick gelatinous coagulum.

2. The pleura is greatly thickened. The thick white layer seen in the photograph between the collapsed left lung and the thin cut edge of the pericardium is evidence of the long-standing nature of the condition.

3. The shape of the left lung is retained despite its greatly decreased bulk. This is especially noticeable in the still well-marked basal border. Firm adhesions retain the rounded dorsal border in the costo-vertebral sinus of the pleura.

4. The heart is translated to the right and is raised within the thorax. It is rotated clockwise through 22 degrees around an antero-posterior axis which passes through the aortic arch. There is, in addition, rotation of the organ, clockwise, around a nearly vertical axis connecting the arterial and venous stems, where continuous, above and below, with the base of the heart.

5. The curve of the ascending aorta is straightened, causing relaxation of its coats and increase in the capacity of the aortic sinus, due to the shortening of the vessel. The mode of origin, position, and direction of the branches arising from the aortic arch are secondarily affected. The roots of the vessels seem as if partially intussuscepted within the lumen of the arch. This results in the formation of transverse folds between their mouths. One of these (that between the innominate and left common carotid) is seen in the photograph. The innominate artery is more transverse in direction and crosses the trachea at a higher level than is usual.

6. The trachea deviates markedly to the right.

Further dissection than that seen in the photograph reveals that:

7. The left pulmonary vessels run obliquely upwards to the lung root; they are stretched and the veins narrowed.

8. The oesophagus, in its course behind the pericardium, is bowed to the right, and the sectional form of the tube is changed by the edge of the distended costo-mediastinal sinus of the pleura. The greatest convexity of the bow lies over an inch to the right of the middle line.

9. The descending thoracic aorta is displaced on to the front of the vertebral column, except at its commencement. It appears markedly flattened between the costo-mediastinal sinus of the pleura and the bodies of the vertebrae.

10. The vena azygos major, where it arches forward over the root of the right lung, is markedly convex to the right, due to the pressure of the displaced oesophagus and trachea in its concavity.

11. The thoracic duct shows considerable dilatation below the level at which it crosses the median plane, and it is very tortuous above that point.

The diaphragm shows a most interesting change. Its left dome is much flattened, and is thrown into numerous folds, whilst its right dome is abnormally high and of smooth surface, as if stretched.

The Abdominal Viscera.

1. The abdominal contents deviate slightly to the right.

2. The spleen, tail of the pancreas, and left kidney are considerably depressed, the lower pole of the last organ reaching $\frac{1}{2}$ in. below the iliac crest. The interrelations of the three viscera are retained.

3. The liver is rotated clockwise so that the right lobe lies well up in the deep right dome of the diaphragm. Further, the organ is compressed transversely, making it deeper than usual. As a result of these two changes the left lobe transgresses only by a very little the median plane.

Comments.

The main factors in the production of these various changes are two, namely:

The alteration in the form of the diaphragm.

The distension of the costo-mediastinal sinus of the pleura.

By reason of the former factor the kidney, the tail of the pancreas and the spleen have descended about 5 cm., and the encroachment on the volume content of the abdomen by the depression of the left dome of the diaphragm has necessitated a compensatory raising of the right dome and, with this, of the liver. The effect of this is to raise the heart bodily and relax all the mediastinal structures running through the length of that space, especially those in the superior compartment, at the same time producing the first of the two rotations of the heart above noted. Under these circumstances respiration would be abdominal in type and carried on almost solely by the right half of the diaphragm, the costal mechanism being incapacitated by the marked distension of

the left side, resulting in a generalized inspiratory position of the whole thoracic parietes. By reason of the latter of the two factors mentioned the whole of the mediastinal structures are pushed over to the right, to the greatest extent at the mid-level of the thorax. In this connexion it is worthy of note that the aorta, oesophagus, and thoracic duct seem to have been affected separately, and their position and relations altered in detail rather than *en bloc*, the pleural sac having insinuated itself between the two former.

The physical signs over the right lung would be altered, as a whole, by a combination of indirect and direct encroachment upon its containing space, whilst the movement of the posterior mediastinal structures would result in the production of an area of dullness on percussion to the right of the vertebrae from the fourth thoracic downwards.

I am indebted to Professor Geddes for the opportunity of publishing this, and to Mr. William Gill for the accompanying photograph.

BIBLIOGRAPHY.

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THE late Dr. George Fielding Blandford left net personalty of the value of £88,244. Dr. Hughlings Jackson left estate valued at £22,637 gross, with net personalty £22,568.