

THE PATHOLOGY OF CONGENITAL HEART DISEASE.*

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Under this term may be discussed all those conditions of the heart which deviate from the normal and which date their origin between the appearance of the earliest rudiments of the heart in the embryo and the expulsion of the fetus from the uterus.

Many classifications have been suggested, but none are thoroughly satisfactory, some being too broadly comprehensive, some only a detailed enumeration of the lesions found. Thus, one classification may be based on etiology, the anomalies being due to: 1, faults of development; 2, fetal endocarditis; 3, a combination of both, either one preceding the other and predisposing to it. Other classifications may be based on the morbid anatomy, on the symptomatology or on the prognosis. For the purposes and limits of this paper, the one already given will perhaps answer best, with a brief working-out along certain lines.

Faults of Development.—A combined anatomic and chronologic division of these may be made into three classes: 1, those occurring early, from the fourth to the sixth week, showing a heart with two or three cavities, *cor biloculare* or *triloculare*, with a single or imperfectly divided arterial trunk; 2, anomalies arising between the sixth and twelfth weeks, with imperfect auricular or ventricular septa, imperfect or misplaced vessels; 3, defects occurring after the twelfth week, resulting in anomalies of the valves, persistence of fetal opening, etc.

Fetal Endocarditis.—Other changes than those already mentioned are usually the result of fetal endocarditis. This arises often as the result of some infectious process in the mother, especially rheumatism, but any infectious fever may cause it; syphilis in the mother is said to play an important part. It may also occur without evidence of illness on the part of the mother. Whether it is necessary, in order to produce the endocarditis, for the germs of disease themselves to pass through the placenta from the maternal to the fetal circulation, an event which certainly happens in some processes, or whether the products of bacterial activity, the toxins circulating in the maternal organism, may by a process akin to dialysis enter the fetal blood, can not be stated in every case. Probability in favor of the latter view is strengthened by the form of endocarditis which is invariably the sclerotic or chronic and never the warty or verrucose. The right heart is far more frequently the seat of the inflammation than the left. The usual reason adduced to explain this is the greater amount of work done, as, in extrauterine life, the left side is more frequently affected. It has been suggested, however, by Rosenbach, that the richness of the blood in oxygen is the determining factor. Another reason given is that the right heart is more often the seat of congenital anomalies of the valves, and these are predisposed to inflammation, just as in extrauterine life diseased valves are a weak spot and prone to recurrent inflammation. Heredity is of great importance according to some authorities, in favoring both anomalies of development and fetal endocarditis, as shown by Mousous' classic cases.

With reference to the anatomic lesions, the following table from Holt's work is interesting, the order given being that of the frequency with which the lesions were present in 242 cases: defect in the ventricular septum; defect in the auricular septum or patent foramen ovale; pulmonary stenosis or atresia; patent ductus arteriosus; abnormalities in the origin of the great vessels; pulmonary insufficiency. The most frequently associated lesions were: pulmonary stenosis with defect of the ventricular septum; pulmonary stenosis with defect of the auricular septum; defects in both septa; pulmonary stenosis with defects in both septa.

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THE DIAGNOSIS OF HEART DISEASE IN CHILDREN.*

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This paper has been prepared on such short notice as to give me no opportunity to consult medical journals and text-book literature. What I have to say is, therefore, purely the result of my own experience with affections of the heart in children.

The first question which naturally arises in diagnosis is, is heart disease present, and if so, is it congenital or postnatal?

Let us take up first the study of congenital heart disease. The principal diagnostic symptoms of this condition are: cyanosis, clubbing of the fingers, thrill, characteristic murmurs, the absence of any great enlargement of the heart.

Cyanosis is peculiarly marked in congenital heart disease; in fact, I do not know of any other condition in which it is so intense. Even in severe forms of postnatal heart disease, with entire lack of compensation and decided blueness of the lips, I never have seen the blue-red tongue, the purplish cheeks, and the general blue suffusion of the body present in the congenital cases. This form of cyanosis, then, is alone an important diagnostic symptom.

Clubbing of the fingers, when present, is a very characteristic symptom. It occurs, it is true, in chronic disease of the lungs, but even the worst cases in this condition show clubbing no greater than, if as great as, that seen in congenital heart disease. Combined, therefore, with cyanosis, clubbing of the fingers is of great diagnostic importance.

The thrill of congenital heart disease is very characteristic. It is very intense, rough, and widely diffused. One may strongly suspect the existence of a congenital affection of the heart from the character of the thrill alone. Yet it is by no means always present.

The typical murmurs of congenital heart disease are loud, rough, and of great intensity. The intensity, in fact, is out of all proportion to the other physical signs connected with the heart. The situation of the murmurs, too, is peculiar. They are not commonly heard with greatest loudness at the apex, but rather over the base of the heart, the sternum and the aortic and pulmonary cartilages. It must be remembered, however, that even in young children there may be loud basic murmurs dependent solely on the existence of great anemia. We must be careful, therefore, not to make the diagnosis from the character of the murmurs alone. I

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