The Symmetrical Liver as a Roentgen Sign of Asplenia

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The young infant with cyanotic congenital cardiac disease presents an acute and difficult diagnostic problem. The anomalies responsible for cyanosis in some such infants are now curable surgically while, on the other hand, there remains a group of cyanotic newborn infants in whom the congenital cardiac anomalies are so complex that no surgical procedures for their correction have yet been devised. A method for early separation of these two groups of patients, that is, operable and inoperable, would be of value.

Among the so-called inoperable group of patients are individuals with asplenia and congenital cardiac disease, since in these the cardiac anomalies are of such a complex nature that they usually defy surgical correction.1

Among a group of cases of asplenia with congenital cardiac diseases the pathologic manifestations include persistent truncus arteriosus, transposition of the great vessels, pulmonary atresia or stenosis, common atrioventricular canal, anomalies of pulmonary veins, and cor biloculare. Moreover, several of these complex malformations usually co-exist in the same patient. Visceral symmetry is common also. One step in the direction of separating by clinical means the operable from the inoperable group is to determine whether the spleen is absent. Evidence favoring asplenia includes certain changes in the peripheral blood and findings of visceral symmetry.

The hematologic findings present in the peripheral blood in patients with asplenia have been well described.2-4 These consist of the presence of Howell-Jolly bodies and Heinz bodies in the erythrocytes as well as numerous erythroblasts.

Putschar and Manion5 as well as Ivemark5 noted the general tendency for visceral symmetry as indicated by the frequent occurrence of three lobes in each lung, a large symmetrical liver, wherein both lobes are of about equal size, persistence of the dorsal mesentery to the duodenum and colon, an anatomic two-chambered heart, and the absence of the only strictly unilateral mesenchymal organ of the body, namely, the spleen. To our knowledge the organ simplest to identify clinically from the point of view of visceral symmetry is the liver. This is done by roentgenographic examination of the upper abdomen, a procedure that usually is a by-product of the routine posteroanterior roentgenogram of the thorax in the cardiac patient (figs. 1 and 2).

In the normal, the lower edge of the liver lies obliquely, as the right lobe is noticeably larger than the left. In hepatic symmetry, as seen in asplenia, the lower edge of the liver lies horizontally. It is the purpose of this communication to call attention to the sign of hepatic symmetry, as a probable sign of asplenia.

Addendum

Since preparation of this manuscript the sign was also described in the following reference: Forde, W. J., and Finby, N.: Roentgenographic features of asplenia, a teratologic syndrome of visceral symmetry. Am. J. Roentgenol. 86: 523, 1961.

References
Figure 1
Posteroanterior roentgenograms from three patients who manifested neonatal cyanosis and death in early infancy. In each instance at necropsy the spleen was absent, the liver was nearly symmetrical, and various combinations of complicated intracardiac malformations were observed. Upper Left. Patient with dextrocardia. Upper Right. Patient with levocardia. Fullness of the shadow caused by the left lobe of the liver is evident in both. Lower. Two illustrations from the same patient. Lower Left. Roentgenogram made during venous angiocardiography. The lower edge of the left lobe of the liver lies prominently at a considerably more inferior level than normal. Lower Right. Film made during intravenous pyelography in the same patient whose roentgenogram is shown in Lower Left bringing out the features of the symmetrical liver.
Figure 2

Thoracic organs and liver from two cyanotic infants with asplenia and multiple intracardiac anomalies. In each instance, the two lobes of the liver are of about equal size. In the case illustrated in Left the lower edge of the left lobe is slightly superior to that of the right lobe, but is considerably lower than the normal. In the specimen illustrated in Right the reverse regarding the lower edge of the liver is true in that the lower edge of the left lobe is slightly inferior to that on the right side. In each instance there were three lobes in both lungs.

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