BLOOD CYSTS ON THE HEART VALVES OF INFANTS*

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Blood cysts occur frequently on the mitral and tricuspid valve cusps of infants, and rarely on the pulmonary or aortic cusps. They are small, rounded, reddish brown, pin-point to pin-head nodules on the submarginal part of the atrial surface of the cusp (Fig. 1), and usually are sessile but may be pedunculated. In different series in the literature, their reported incidence has ranged from 25 per cent (Luschka,[1] 1857) to almost 100 per cent (Fahr,[2] 1906). They have not been found to be related to other congenital anomalies. The cysts seem to disappear with age, as they are uncommon after 6 months of age. Rare cases have been described in children and adults. Elsässer[3] first described these lesions in 1844, and the subject is well reviewed, with complete references, by Levinson and Learner[4] (1932) and Dow and Harper[5] (1936).

Microscopically, they are masses of red blood cells and a few white blood cells packed in a spherical or ovoid cyst, lying in the connective tissue of the cusp, and lined by a single layer of flat endothelium. When large, they project on the atrial surface, and the connective tissue and endothelium of the cusp are stretched over them. They are usually unilocular, but sometimes have small extensions (A, Figs. 2 and 3), or shallow septa.

Their mode of origin is not definitely known, but they have been variously described as hematomas, angiomas, ectatic or dilated blood vessels, regressive blood vessels, and as being due to blood being pressed into crevices on the ventricular surface of the cusp with subsequent fusion of the mouth. All but the last assume that capillaries or blood vessels exist in the cusps, but Harper[6,7] (1940 and 1945) has shown that blood vessels are present only at the base of the cusp.

Several of these cysts were found on the tricuspid and mitral cusps of an infant who had coarctation of the aorta and died 1 hour after delivery. In a study of serial sections of the posterior mitral cusp, two observations were made which supported the last of the explanations given.

Crevices are common along the ventricular surface of the mitral and aortic valve cusps, and are situated between the attachments of the chordae tendinae. Their formation is believed to be aided by the pressure of the blood when the cusps are being fashioned in utero. One of them, (B), is shown in Figures 2 and 3. In Figure 2, the crevice appears to be

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an empty space, but when followed farther (Fig. 3), it communicates with the ventricle by a narrow mouth. It can readily be imagined how this mouth could undergo closure.

In the blood cysts, evidence that closure had actually occurred is illustrated in Figure 4. Two consecutive sections showed a bar of endothelium joining the ventricular surface to the lining of a small blood cyst.

SUMMARY

Blood cysts are commonly present on the heart valves of infants. The evidence from serial sections of a mitral cusp supports the explanation that they result from blood being pressed into crevices on the ventricular surface of the cusps. Subsequent fusion of the mouths of the crevices forms the blood cyst.

The photographs were taken by Miss J. G. Brown.

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DESCRIPTION OF PLATE

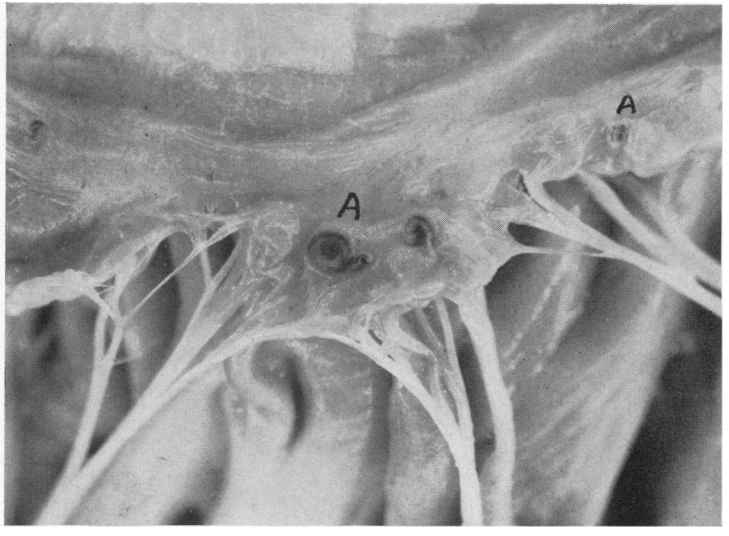
PLATE 114

FIG. 1. Blood cysts (A) on the mitral valve. Approximately × 15.

FIG. 2. Space (B) represents the crevice. A large blood cyst projects on the atrial surface and two small ones (A) are embedded in the cusp. Hematoxylin and eosin stain. × 65.

FIG. 3. Crevice (B) joins the ventricle by a narrow mouth. One small blood cyst is seen to arise as a bud from the other. Hematoxylin and eosin stain. × 65.

FIG. 4. A bar of endothelium joins the lining of the small cyst to the ventricular surface of the cusp. Hematoxylin and eosin stain. × 328.



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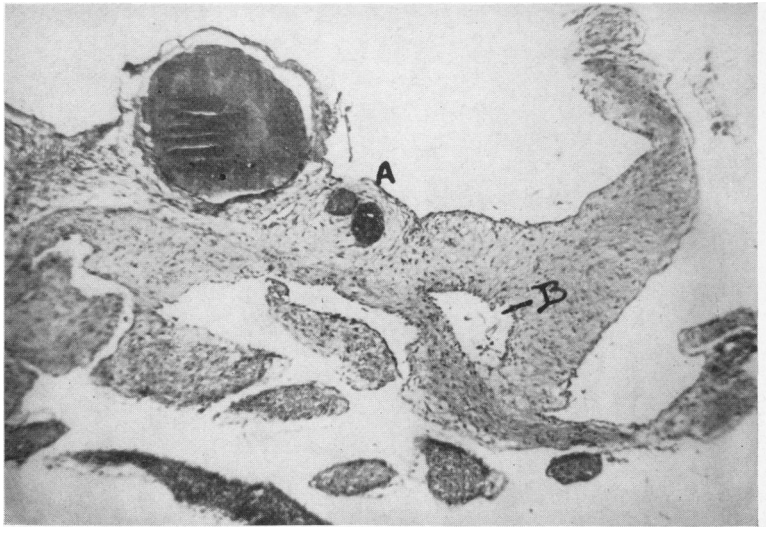

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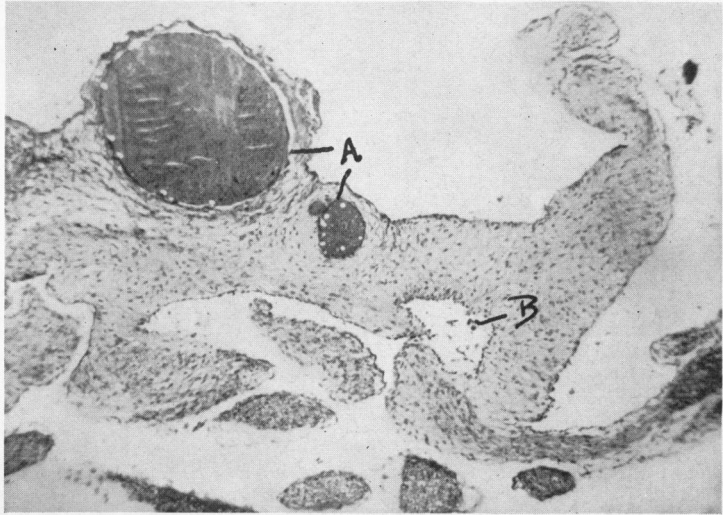

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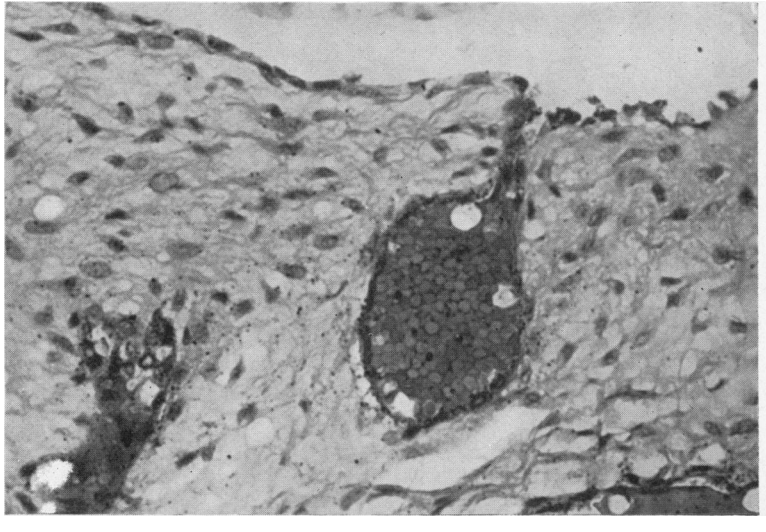

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