Double left atrial appendage: A diagnostic dilemma

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ABSTRACT

We report a unique intraoperative finding of an additional double left atrial appendage (LAA) during an arterial switch operation with ventricular septal defect closure in a 4-month-old girl. Immediately after the procedure, a prolapsing mass within the left atrium (LA) on the transesophageal echocardiogram raised concerns of a possible thrombus. The LAA was clearly visible with a pressure monitoring line which was put intraoperatively. To investigate further, cardiopulmonary bypass was resumed, and the heart was arrested and explored. There was an appendage-like structure, separate from the one that had the pressure monitoring line, which was inverted inside. It was pulled out from outside clearly establishing a double LAA. This report illustrates an example of a diagnostic dilemma caused by a double atrial appendage which was invaginated into LA masquerading as a mass or thrombus.

Keywords: Arterial switch, double atrial appendage, surgery

CLINICAL SUMMARY

A 4-month-old female child came to us with complaints of respiratory distress and cyanosis. She was diagnosed by echocardiography as a case of transposition of great arteries and large subpulmonic ventricular septal defect (VSD). The great arteries were anteroposteriorly related, the coronary arteries were arising from the facing sinuses, and the left ventricular outflow tract had mild flow acceleration (22 mm Hg). There was severe pulmonary artery hypertension, and the left-sided chambers were dilated.

The child underwent arterial switch operation with VSD closure by Dacron patch.

The coronary arteries were arising normally (1 LC × 2R). There was some size mismatch between neo-aorta and distal native aorta which was addressed by excising a part of neo-aorta in the noncoronary sinus. Total cardiopulmonary bypass (CPB) and cross-clamp time were 220 min and 150 min, respectively. The child was weaned off CPB uneventfully.

Postoperative transesophageal echocardiography (TEE) showed VSD patch *in situ*, no residual shunt, no atrioventricular valve regurgitation, mild neo-aortic regurgitation, wide open right ventricular outflow tract, and good biventricular function. In addition, there was a prolapsing mass across the mitral valve level in the left atrium (LA) [Figure 1a and b].

We thought of an invaginated left atrial appendage (LAA) into LA, but the appendage was clearly visible with the LA pressure monitoring line *in situ*. The second possibility was of a thrombus. Therefore, we decided to go on the

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pump again, and the heart was arrested. The right atrium and interatrial septum were opened to look inside the LA. There was an appendage-like structure that was inverted inside [Figure 2]. Now, the heart was lifted, and the existence of a second appendage was appreciated. It was pulled out from outside [Figure 3]. We came off CPB without any difficulty. TEE showed the disappearance of the mass [Figure 4] and moderate left ventricular dysfunction. The chest was kept open electively. The chest was closed on the first postoperative day, and the child was discharged on the 9th postoperative day uneventfully.

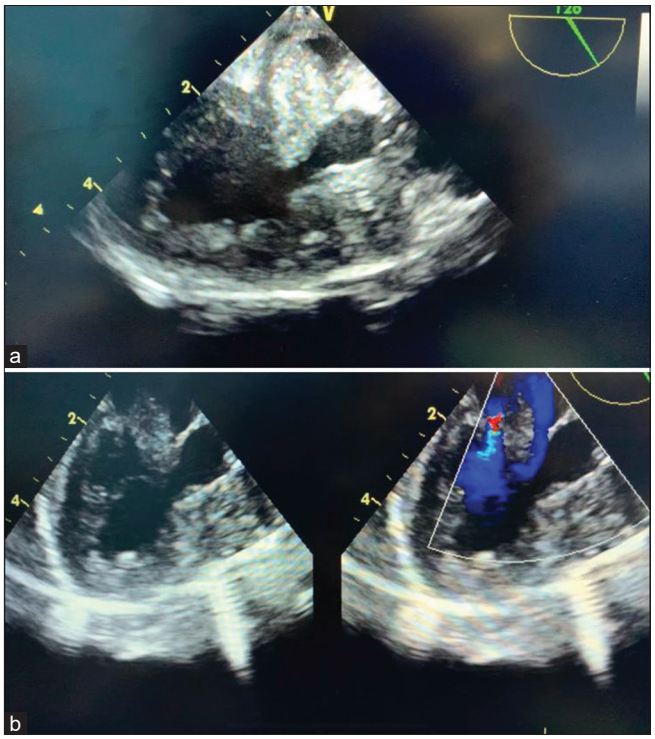

Figure 1: (a and b) Transesophageal echocardiogram showing a mass/thrombus in the left atrium, prolapsing across the mitral valve

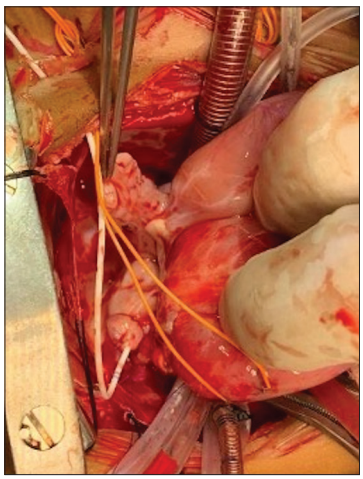

Figure 3: The double atrial appendage after pulling out one of them from inside the left atrium. The left atrium pressure monitoring line is seen in one of them

DISCUSSION

The LAA is usually a narrow, tubular, wavy, and hooked appendage with a narrow and crenated lumen.[1-3] It is usually one in number, but the existence of multilobed LAA has been documented. In a study by Veinot *et al.*, which spanned 500 normal human hearts from 1960 to 1982, LAA length, width, orifice size, size of pectinate muscles, and number of lobes were recorded.[4] In our case, the number of lobes was observed by external examination and confirmed by probe exploration after the LAA was opened.

A lobe was defined by the following criteria:[2]

- Visible outpouching from the main tubular body of LAA, demarcated by an external crease
- Internally capable of admitting a 2 mm probe
- Occasionally, but not necessarily associated with a change in direction of the main tubular body of LAA
- Could lie in a different anatomic plane
- Must have at least one lobe.

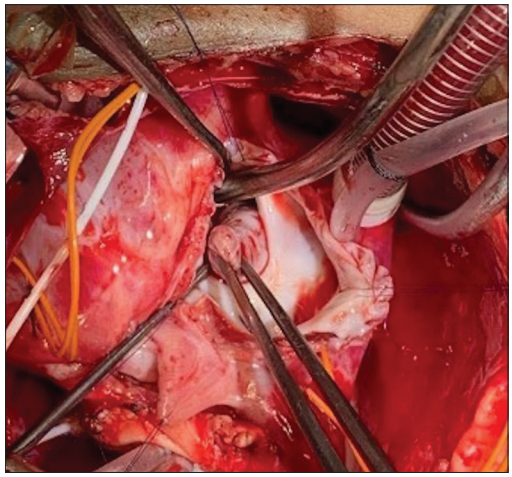

Figure 2: One of the atrial appendages inverted into the left atrium

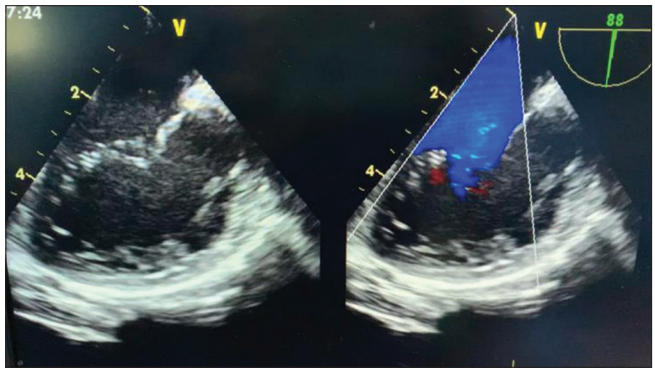

Figure 4: Transesophageal echocardiogram showing the disappearance of the mass

In our case, there were two distinct appendages arising from LA. One of the appendages prolapsed into LA across the mitral valve. Probably, we could have lifted the heart without going on CPB again. However, the already visible LAA with a pressure monitoring line raised the possibility of thrombus more strongly in our minds. Therefore, it is important to know the existence of such an additional LAA preoperatively if possible. It can easily be confused with a thrombus or the possible presence of a thrombus in one of the appendages.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published, and due efforts will be made to conceal patient identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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