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Left atrial appendage thrombus in a term neonate with ventricular dysfunction

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Case Report

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Abstract

Left atrial appendage thrombosis is exceedingly rare in neonates and may present with non-specific findings. We report a term neonate presenting with poor feeding and a gallop rhythm, who was found to have a large left atrial appendage thrombus with ventricular dysfunction. Surgical excision resulted in rapid recovery, highlighting the importance of early echocardiographic evaluation in subtle neonatal heart failure.

Introduction

Left atrial appendage thrombosis is exceptionally rare in neonates and has most often been reported in association with predisposing factors such as central venous catheterisation or structural heart disease. Clinical manifestations are frequently nonspecific, which may delay recognition. We report a case of neonatal left atrial appendage thrombus presenting with subtle signs of heart failure, highlighting diagnostic considerations and possible pathophysiologic mechanisms.

Case report

A 7-day-old term neonate was referred to a paediatric cardiac centre for evaluation of suspected heart failure after detection of an abnormal cardiac sound on routine examination. She was born at 40 + 1 weeks of gestation via emergency caesarean section due to failure of labour progression, with a birth weight of 2.8 kg. Prenatal ultrasonography had not revealed any structural cardiac abnormalities or intracardiac masses. The immediate postnatal course was unremarkable, with no history of perinatal asphyxia, infection, congenital anomalies, or known thrombotic risk factors. Despite overall clinical stability, feeding was poor, with frequent early fatigue and intake limited to 10–15 mL per feeding. On postnatal day 7, cardiac auscultation revealed a distinct gallop rhythm at the left lower sternal border and apex. Vital signs were within normal limits; however, given the combination of poor feeding and gallop sound, further cardiac evaluation was undertaken. Transthoracic echocardiography demonstrated a 5 × 10 mm mass in the left atrial appendage with an echogenic rim and echo-lucent core, consistent with a left atrial appendage thrombus (Figure 1). A patent foramen ovale and patent ductus arteriosus were present, along with moderate biventricular systolic dysfunction (left ventricular ejection fraction, 40%). Basic haematologic and coagulation studies, including complete blood count, prothrombin time, activated partial thromboplastin time, fibrinogen, and D-dimer levels, were within normal neonatal reference ranges. Anticoagulation with low-molecular-weight heparin was initiated. Follow-up echocardiography after two days showed mild improvement in ventricular function; however, the thrombus persisted. Given the potential risk of systemic embolisation, surgical intervention was performed, including left atrial auricle excision with en bloc thrombus removal, primary closure of the patent foramen ovale, and division of the patent ductus arteriosus (Figure 2). Histopathological examination confirmed an organised intracardiac thrombus with endocardial myxoid thickening and focal calcification (Supplementary 1). Postoperatively, ventricular function normalised, and the patient was discharged on postoperative day 7. Cardiac medications were discontinued at one month, and the patient remains asymptomatic with normal cardiac function at one-year follow-up.

Discussion

Neonatal left atrial appendage thrombosis is exceedingly rare, with only a few cases reported to date. Previously described cases have suggested that left atrial appendage thrombus in neonates may originate from prenatal or perinatal events, particularly when calcification or an organised thrombus is identified histologically.[1] Surgical excision has been reported in cases with increasing thrombus mobility, highlighting the risk of systemic embolisation.

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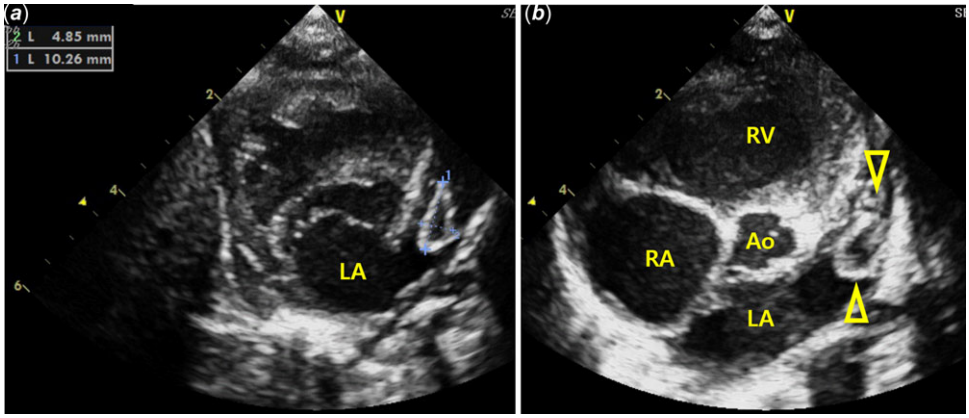


Figure 1. Transthoracic echocardiographic images demonstrating a mass-like lesion in the left atrial appendage. (***a***) Modified two chamber view showing an echogenic mass within the left atrium (LA), measuring approximately 5 × 10 mm. (***b***) Parasternal short-axis view illustrating the mass (arrowheads) located within the left atrial appendage, protruding into the left atrial cavity.



Figure 2. Gross photograph of the excised specimen obtained from the left atrial appendage. The specimen consists of an irregular, friable mass measuring approximately 1.5 × 1.5 × 1.0 cm, corresponding to the surgically removed organised thrombus.

The clinical presentation of neonatal left atrial appendage thrombosis is often nonspecific. While arrhythmia or incidental imaging findings have been reported in prior cases, the present case illustrates that subtle signs of heart failure, such as poor feeding and a gallop rhythm, may be the primary manifestations in the absence of arrhythmic or embolic events.[2–4] The ventricular dysfunction observed in this patient was most likely multifactorial, with patent ductus arteriosus-related volume overload and perinatal haemodynamic stress representing the principal contributors. The left atrial appendage thrombus was unlikely to be the primary cause of ventricular dysfunction; however, it may have subtly influenced atrial mechanics and intracardiac flow.[5] In neonates, high heart rates and limited diastolic filling time increase dependence of ventricular preload on atrial compliance, and a left atrial appendage mass may therefore interfere with ventricular filling.[6] Importantly, postoperative recovery of ventricular function was most likely driven by relief of volume overload following patent ductus arteriosus ligation, with removal of the left atrial appendage thrombus providing a complementary benefit. A direct causal relationship cannot be established.

Histopathological findings were consistent with a chronic or subacute organised thrombus rather than an acute thrombotic event, supporting a non-acute disease process in the absence of identifiable infection or perinatal inflammatory insult. Management of intracardiac thrombus in neonates should be individualised, considering thrombus size, mobility, location, and associated haemodynamic compromise.[7] Although anticoagulation is often the first-line therapy, surgical intervention may be appropriate in selected cases.[8] In the present case, the thrombus was large and mobile, located on the systemic side of the circulation, and persisted despite anticoagulation; in conjunction with a patent foramen ovale and ventricular dysfunction, this raised concern for systemic embolisation and ongoing haemodynamic impact. Surgical excision allowed definitive thrombus removal with simultaneous correction of associated shunt lesions.[9]

Although intracardiac thrombus is extremely rare in neonates, this case underscores that careful attention to subtle clinical signs may prompt timely evaluation and facilitate detection of uncommon intracardiac pathology, enabling appropriate management even in such rare circumstances.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S104795112611155X.

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Competing interests. None.

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