

Prenatal diagnosis of a left ventricular diverticulum

Abstract

A congenital left ventricular diverticulum is a rare prenatal finding. The four-chamber view of the heart is a standard part of the 18–20 week morphology scan, and evaluation of the heart with colour Doppler imaging has greatly enhanced the detection of rare and subtle cardiac anomalies.

Keywords: congenital heart defects, left ventricular diverticulum, prenatal diagnosis.

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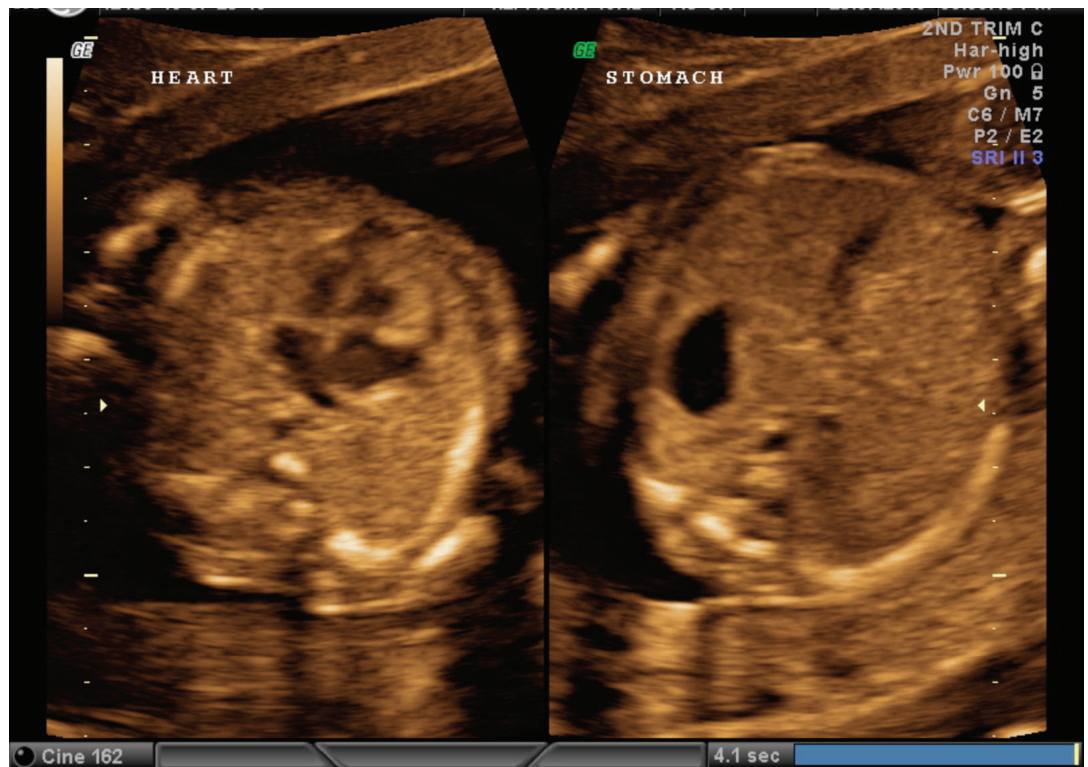


Figure 1: Transverse view through the thorax demonstrating a centrally positioned heart and apex angled to the midline, and transverse view through the abdomen demonstrating a left sided stomach.

Case report

A 40-year-old G1P0 woman presented to our department for a routine morphology scan. Biometry was consistent with a gestation of 17 weeks. Examination of the heart revealed mesocardia (Figure 1), and evaluation with colour Doppler imaging demonstrated a thin, finger-like projection arising from the apex of the left ventricle. This was not apparent with 2D imaging (Figure 2). Evaluation of the ventricular septum revealed a small perimembranous defect (Figure 3). After counselling, an amniocentesis was performed; the karyotype was normal. The pregnancy was otherwise uneventful with a term live birth. The child is currently well at two years of age and has not required surgery.

Discussion

The true incidence of congenital ventricular diverticula is difficult to ascertain, as these lesions are often grouped with congenital aneurysms when described in the literature.^{1,2} In the adult population, the presence of a congenital ventricular diverticulum has been reported in 0.26% of patients undergoing cardiac catheterisation, and found in 0.4% of autopsies after cardiac death.³

While congenital left ventricular diverticula may occur in all chambers of the heart, the left ventricle is most frequently affected.^{3,4} Typically, a congenital diverticulum is a narrow necked, finger-like projection arising from the apex which contracts synchronously with the heart.^{1,4}

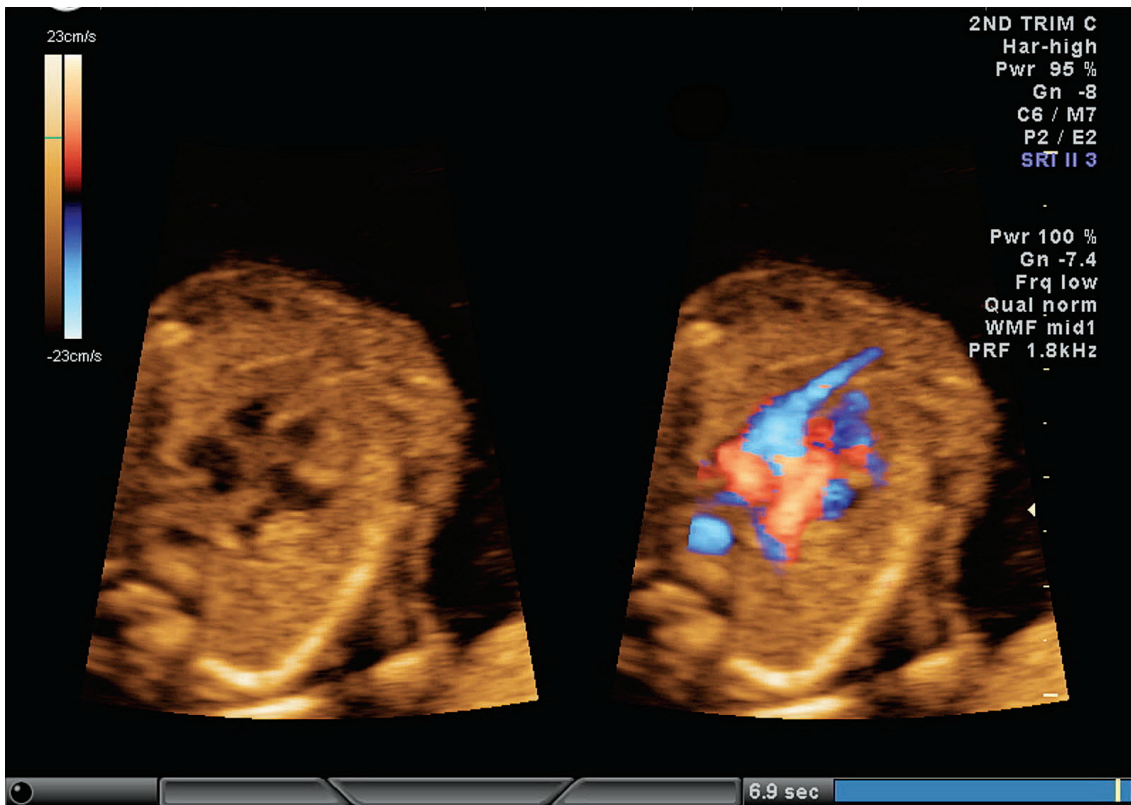


Figure 2: Colour Doppler imaging of the four-chamber view demonstrating the left ventricular diverticulum.

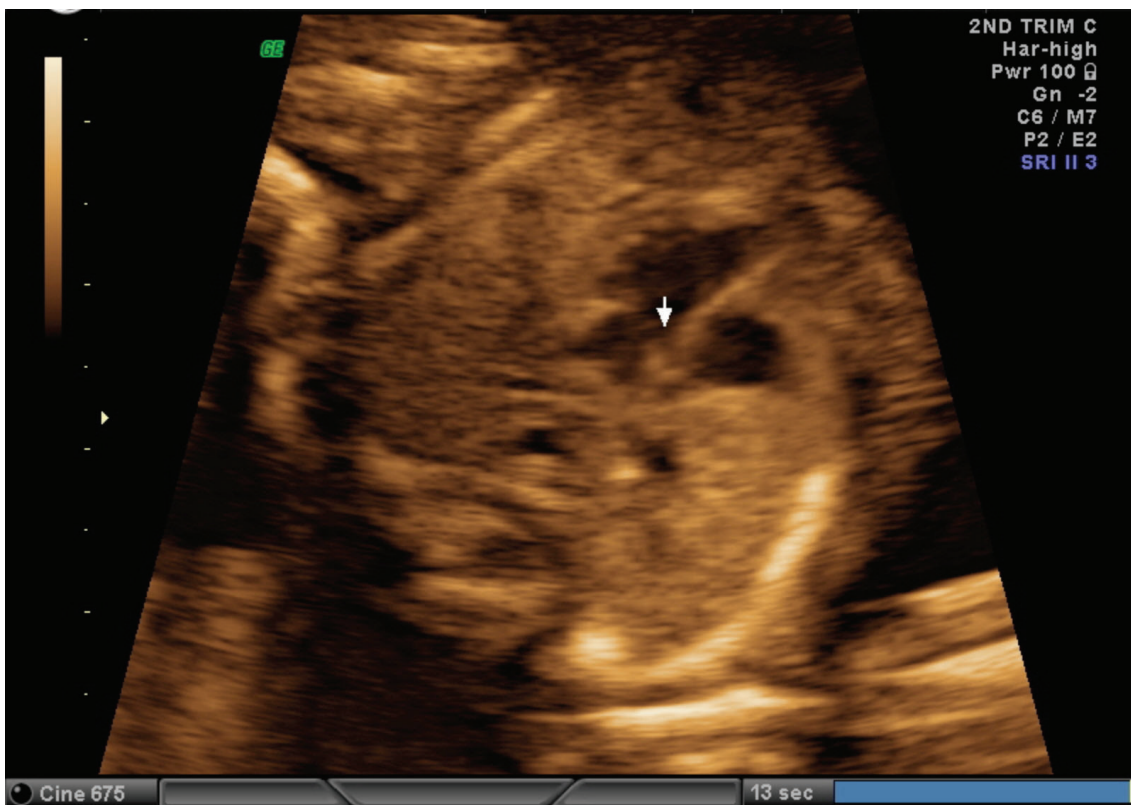


Figure 3: Small perimembraneous ventriculoseptal defect (arrow).

By comparison, a congenital aneurysm is characterised by a broad base communicating with the subvalvular region of the ventricle, and is typically dyskinetic.^{1,4}

Congenital left ventricular diverticula are associated with other structural cardiac anomalies or midline thoracic or abdominal defects.¹ The most common cardiac defects include ventricular septal defect, atrial septal defect, tricuspid atresia, tetralogy of Fallot, and cardiac malposition. Midline defects include abnormalities of the sternum, rectus abdominus muscles, umbilical hernias and omphaloceles⁴. These midline defects are described in Pentalogy of Cantrell, giving rise to the theory that an apical left ventricular diverticulum is a mild expression of the syndrome.² Chromosomal abnormalities are rarely associated.⁴

In-utero complications include cardiac dysrhythmias and pericardial effusions.¹

Thrombus within a ruptured left ventricular diverticulum has been described at the post mortem of a 22-week fetus.²

The etiology of a ventricular diverticulum is uncertain; possibilities include developmental abnormalities in embryogenesis, viral infections, and myocardial ischaemia.^{1,4} Histologically, diverticula contain all layers of the ventricular wall with preserved myocardial architecture. This contrasts with aneurysms, which most commonly contain only connective tissue, and explains why the contractile behaviour of these two entities differs.⁴

The natural history of left ventricular diverticula is uncertain; the prognosis is generally determined by associated abnormalities. An isolated left ventricular diverticulum may be asymptomatic, however, complications such as ventricular tachyarrhythmia, systemic embolism, spontaneous rupture, valvular regurgitation and sudden death have been reported in adult and paediatric patients.^{3,4} The prenatal diagnosis of a left ventricular diverticulum remains a prognostic dilemma.

References

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