

SPOT DIAGNOSIS USING PULSE WAVE DOPPLER INTERROGATION OF THE ABDOMINAL AORTA

KARIMA ADDETIA, MD AND JUDITH THERRIEN, MD

DIVISION OF CARDIOLOGY, MCGILL UNIVERSITY HEALTH CENTER, MONTREAL, QC, CANADA

KEY WORDS: Echocardiography · Abdominal aorta · Doppler · Pulse wave · Fontan.

The abdominal aorta is easy to interrogate by transthoracic echocardiography in the majority of ambulatory patients and its interrogation is often part of the complete transthoracic study. Here we demonstrate four different findings on pulsed wave Doppler interrogation of the abdominal aorta. The

pulsed wave signals were obtained from the subcostal longitudinal plane at the level of the diaphragm. The first case (Fig. 1A) is that of a 30-year-old male with a normal heart and a normal Doppler recording of the abdominal aorta.¹⁾ There is a brisk systolic upstroke and rapid return to baseline at the end of sys-

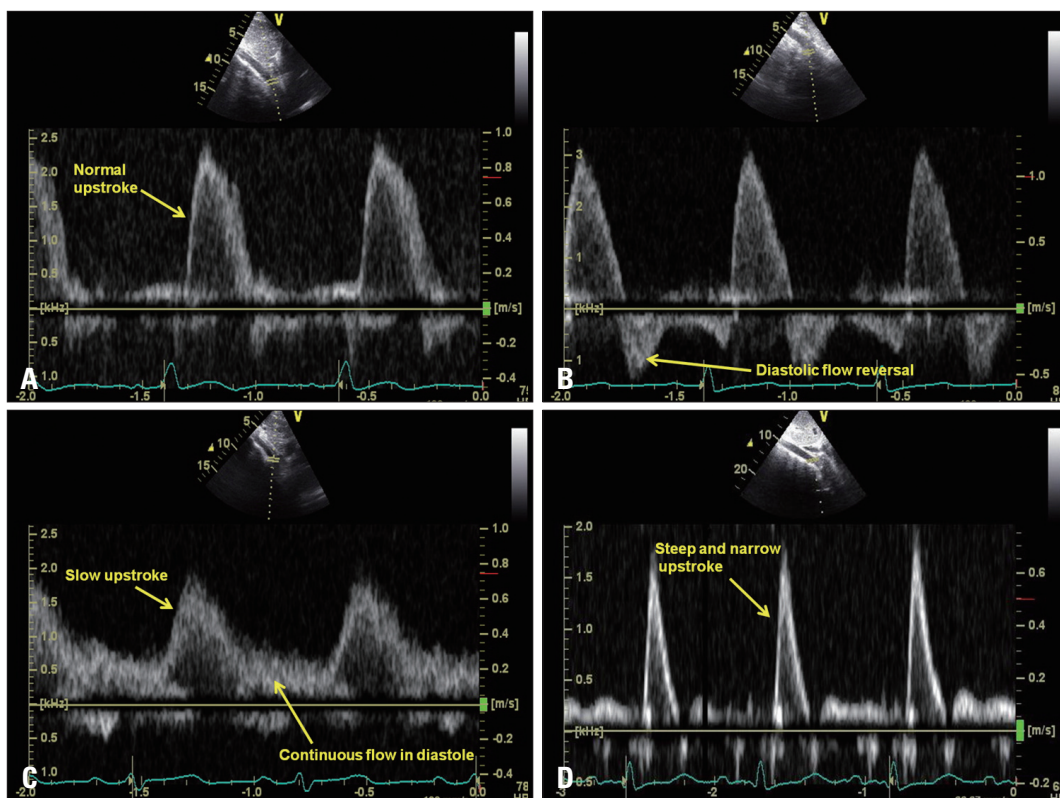


Fig. 1. A: Normal individual. B: Severe aortic insufficiency. C: Severe coarctation. D: Individual with tricuspid atresia and failed systemic venous to pulmonary artery connection (Fontan operation) demonstrating a low cardiac output and increased peripheral vasoconstriction.

• Received: January 30, 2012 • Revised: March 8, 2012 • Accepted: May 5, 2012
 • Address for Correspondence: Karima Addetia, Division of Cardiology, McGill University Health Center/Royal Victoria Hospital, 687 Pine Avenue West, Montreal, QC H3A1A1, Canada Tel: +1-514-934-1934, Fax: +1-514-843-2813, E-mail: kaddetia@gmail.com
 • This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

tole. Very early diastolic flow reversal as well as late-diastolic flow may be seen due to a patent aorta with rapid elastic recoil. The second recording (Fig. 1B) is that of a patient with severe aortic insufficiency and holodiastolic flow reversal in the abdominal aorta.²⁾ Fig. 1C shows a patient with coarctation of the aorta.³⁾ Note that the overall forward velocity is blunted, the time to peak systolic velocity is delayed and that there is persistent forward flow throughout diastole due to the severe upstream obstruction. Fig. 1D was taken from a 30-year-old patient with tricuspid atresia and failed systemic venous to pulmonary artery connection (Fontan operation). Her cardiac output on cardiac catheterization by thermodilution technique was calculated at 2.2 L/min. The steep rise and narrow width of the aortic pulsation is suggestive of low stroke vol-

ume and peripheral vasoconstriction consistent with a low cardiac output state.

REFERENCES

1. Chavhan GB, Parra DA, Mann A, Navarro OM. *Normal Doppler spectral waveforms of major pediatric vessels: specific patterns. Radiographics* 2008;28:691-706.
2. Takenaka K, Dabestani A, Gardin JM, Russell D, Clark S, Allie A, Henry WL. *A simple Doppler echocardiographic method for estimating severity of aortic regurgitation. Am J Cardiol* 1986;57:1340-3.
3. Silvilairat S, Cetta F, Biliciler-Denktaş G, Ammash NM, Cabalka AK, Hagler DJ, O'Leary PW. *Abdominal aortic pulsed wave Doppler patterns reliably reflect clinical severity in patients with coarctation of the aorta. Congenit Heart Dis* 2008;3:422-30.