ACKNOWLEDGEMENTS

We thank the EMS providers of King County for their ongoing commitment.

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Funding: The study was funded in part by a grant from the Laerdal Foundation of Acute Medicine. The Foundation had no role in study design, data collection or interpretation.

Competing interests: None.

REFERENCES

- 1 Zheng ZJ, Croft JB, Giles WH, *et al.* Sudden cardiac death in the United States, 1989 to 1998. *Circulation* 2001;**104**:2158–63.
- 2 Holmberg M, Holmberg S, Herlitz J. An alternative estimate of the disappearance rate of VF in out-of-hospital cardiac arrest in Sweden. *Resuscitation* 2001;**49**:219–20.
- 3 Atwood C, Eisenberg MS, Herlitz J, *et al.* Incidence of EMS-treated out-of-hospital cardiac arrest in Europe. *Resuscitation* 2005;**67**:75–80.
- 4 Rea TD, Eisenberg MS, Sinibaldi G, *et al.* Incidence of EMS-treated out-of-hospital cardiac arrest in the United States. *Resuscitation* 2004;**63**:17–24.
- 5 Jacobs I, Callanan V, Nichol G, *et al.* The chain of survival. *Ann Emerg Med* 2001;**37**:S5–16.
- 6 Hallstrom AP, Cobb LA, Yu BH. Influence of comorbidity on the outcome of patients treated for out-of-hospital ventricular fibrillation. *Circulation* 1996;**93**:2019–22.
- 7 Weisfeldt ML, Becker LB. Resuscitation after cardiac arrest: a 3-phase time-sensitive model. *JAMA* 2002;**288**:3035–8.
- 8 Rea TD, Pearce RM, Raghunathan TE, *et al.* Incidence of out-of-hospital cardiac arrest. *Am J Cardiol* 2004;**93**:1455–60.
- 9 United States Bureau of the Census. Census 2000. Geographic area: King County, Washington, www.census.gov (accessed 23 August 2005).
- 10 American Heart Association. Advanced cardiac life support guidelines. Dallas, TX: American Heart Association, 2000.
- 11 Eisenberg MS, Hallstrom AP, Carter WB, *et al.* Emergency CPR instruction via telephone. *Am J Public Health* 1985;**75**:47–50.
- 12 Rea TD, Eisenberg MS, Becker LJ, *et al.* Temporal trends in sudden cardiac arrest: a 25-year emergency medical services perspective. *Circulation* 2003;**107**:2780–5.
- 13 Fang X, Tang W, Sun S, *et al.* Cardiopulmonary resuscitation in a rat model of chronic myocardial ischemia. *J Appl Physiol* 2006;**101**:1091–6.
- 14 Indik J, Donnerstein R, *et al.* Ventricular fibrillation waveform characteristics are different in ischemic heart failure compared with structurally normal hearts. *Resuscitation* 2006;**69**:471–7.

IMAGES IN CARDIOLOGY

doi: 10.1136/hrt.2006.095570

The “winking” coronary sinus

A 79-year-old woman presented with increasing dyspnoea over 1 year. She had a history of chronic atrial fibrillation and examination showed the presence of a systolic and diastolic murmur. A dilated coronary sinus (CS) was seen on transthoracic echocardiography (panels A and B). In the parasternal short axis view, the coronary sinus could be seen “winking” in the right atrium (supplementary movie file available online at <http://heart.bmj.com/supplemental>). This was probably due to the dilated circular end of the CS moving in and out of the echocardiographic plane during the cardiac cycle. On coronary angiography, there was a giant right coronary artery draining through a fistula into the coronary sinus and then into the right atrium. A right-heart study showed a rise in oxygen saturation from 55% in the inferior vena cava to 66% in the right ventricle. The Qp:Qs shunt ratio was 1:4.

This elderly patient had a congenital coronary artery fistula between the distal right coronary artery (arterial) and the coronary sinus (venous). Increased arteriovenous flow had resulted in marked dilatation of the right coronary artery and the right coronary sinus.

Treatment options include surgical ligation or use of a transcatheter closure device. The patient declined these treatment options and was managed conservatively.

Supplementary movie file available at <http://heart.bmj.com/supplemental>

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(A) Transthoracic echocardiogram in parasternal short axis view at the level of the left ventricular outflow tract just below the aortic valve. The circular contour of the dilated coronary sinus can be seen at this level during ventricular diastole. (B) Parasternal long axis view of the right ventricular inflow tract, showing the dilated coronary sinus. CS, dilated coronary sinus; LA, left atrium; LV = left ventricle; RA, right atrium.