

If admitted to Home Treatment a comprehensive package of care is offered that on average lasts two to three weeks but can extend up to twelve weeks and may involve several visits per day. Patients and carers are actively involved, with support and education comprising a significant part of the treatment delivered.

Being within the home enables robust assessment of the patient's social supports allowing the team to address directly any effects these may be having. Cases are discussed at twice daily handovers, with review of the overall care plan occurring during the twice weekly, consultant led multidisciplinary clinical meeting. Discharge planning is paramount with discussion on relapse indicators, relapse plans and a joint home visit to handover to a patient's long term key worker.

The switch of the hospital admission gate-keeping role from sector consultants and GPs to the team has been a challenging transition. However, ongoing development of gate-keeping is vital to ensure the continued effectiveness of the team<sup>4</sup>.

We are fortunate that Home Treatment offers an alternative to patients, carers and clinicians. While endorsing it in its own right it is clear that its ultimate usefulness is within the context of an integrated comprehensive mental health care system.

#### ACKNOWLEDGEMENTS

Many thanks to Dr Neta Chada and Mr Adrian Corrigan from the Home Treatment Crisis Response Team, Southern Health and Care Trust for their advice and support.

The author has no conflict of interest

#### REFERENCES

1. Johnson S, Nolan F, Hoult J, White IR, Bebbington P, Sandor A, *et al*. Outcomes of crisis before and after introduction of a crisis resolution team. *Br J Psychiatry*. 2005; **187**(1): 68-75.
2. Glover G, Arts G, Babu KS. Crisis resolution/home treatment teams and psychiatric admission rates in England. *Br J Psychiatry*. 2006; **189**(1): 441-5.
3. Dean C, Phillips J, Gadd E, Joseph M, England S. Comparison of a community based service with a hospital based service for people with acute, severe psychiatric illness. *BMJ*. 1993; **307**(6902): 473-6.
4. Onyett S, Linde K, Glover G, Floyd s, Bradley S, Middleton H. Implementation of crisis resolution/home treatment teams in England: national survey 2005-2006. *The Psychiatrist*. 2008; **32**: 374-7

Helen Connolly

Specialist Registrar General Adult Psychiatry

Correspondence

Dr Helen Connolly

Holywell Hospital, Northern HSC Trust  
60 Steeple Road, Antrim, BT41 2RJ

Email: helen.connolly@northerntrust.hscni.net

#### PERFORATION INTO THE PERICARDIAL SAC OF AN INFANT: A RARE COMPLICATION OF CENTRAL VENOUS CATHETER INSERTION

Editor,

Cardiac tamponade following insertion of a central venous

(CV) catheter is a rare but recognised complication associated with a high mortality rate, that was addressed recently in a circular from the Department of Health, Social Services and Public Safety in Northern Ireland (1). We report a case of CV line perforation into the pericardium that was diagnosed early by a simple contrast study.

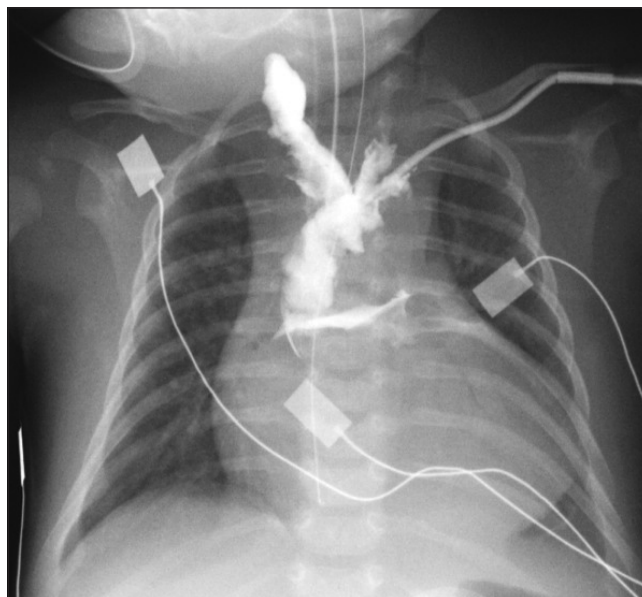


Fig 1. "Linogram" study. Water-soluble contrast has been injected into the left subclavian line. The contrast extravasates from the line tip outlining the central great vessels and the superior aspect of the pericardial sac.

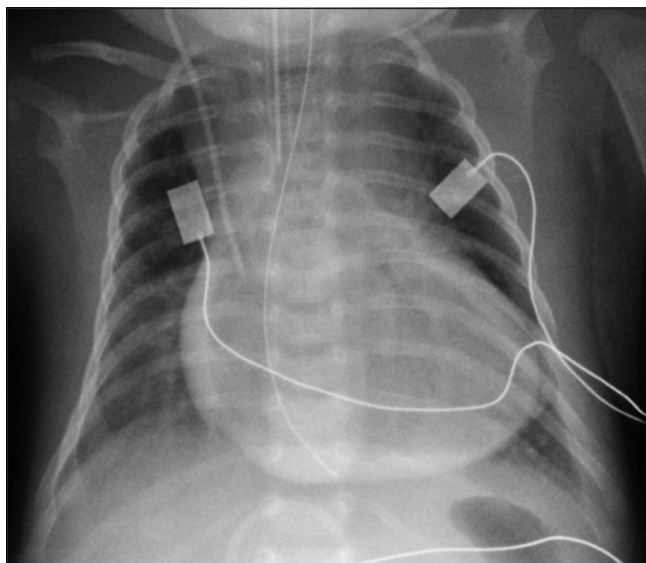
A male neonate was born by elective Caesarean section following an antenatal diagnosis of exomphalos major. During a stormy in-patient course, a left-sided subclavian line (SCL) was inserted on day 33 of life. In the hours that followed, the patient's left arm and face were noted to be "puffy". The SCL was documented to be flushing easily but not bleeding back; its use was discontinued and a "linogram" contrast study requested [Fig. 1]. Contrast was seen outlining the central great vessels and the superior aspect of the pericardial sac. A follow-up chest radiograph showed layering of contrast within the pericardial sac, outlining the heart [Fig. 2]. An echocardiogram demonstrated a small pericardial effusion.

The infant gradually recovered from his surgeries over the next weeks and was discharged at 3 months.

#### DISCUSSION

Complication rates for CV catheter insertion vary between studies depending upon the puncture site. Earlier studies reported rates of up to 6% for infra-clavicular subclavian line insertion (2), with the rate of complication being less for those operators with greater experience (3,4).

In the described case, no problems at the time of line insertion were recorded in the patient's operative notes, and an immediate chest radiograph showed a catheter that appeared to be well placed. A subsequent contrast study showed the line tip to have perforated into the pericardial sac; a complication that is associated with a significant mortality



*Fig 2.* Follow up chest radiograph after removal of the left subclavian line and insertion of a new right-sided internal jugular vein catheter. Contrast is seen filling the pericardial sac, outlining the heart.

rate due to the risks of cardiac tamponade if the problem is not recognised and fluid infusions via the line continue (5). In 2009, a circular from the Department of Health in Northern Ireland highlighted the risks of CV line insertion. It followed a review after a patient died from cardiac tamponade due to a perforated right atrium, as a complication of CV line insertion. Whilst late perforation may be caused by the catheter tip eroding through the vein or chamber wall (2), early tamponade was thought more likely due to the dilator used to assist line placement. The Department counselled

that dilators should not be inserted to the hilt over the guide wire, but should only be inserted far enough to open the vein puncture site. Moreover, cardiac tamponade should be considered if a patient clinically deteriorates soon after CV catheter placement. In the infant described, the line had been in situ for only a few hours before problems became apparent, and its use was immediately halted. This case highlights a rare and serious complication of CV line insertion that both radiologists and intensivists should be aware of.

The authors have no conflict of interest.

#### REFERENCES

1. Livingstone JF. Learning circular (SQS–LC03/09): Cardiac tamponade and the use of dilators. Safety and Quality Unit, Department of Health, Social Services and Public Safety, Stormont, Belfast. Issued 09.02.2009.
2. Mitchell SE, Clark RA. Complications of central venous catheterization. *Am J Roentgenol* 1979; **133**: 467-476.
3. Zaman MH, Mitra P, Bondi E et al. A rare malposition of the central venous catheter. *Chest* 1990; **98**:768-770.
4. Bernard RW, Stahl WM. Subclavian vein catheterizations: a prospective study. 1. Non-infectious complications. *Ann Surg* 1971; **173**: 184-190.
5. Cartwright DW. Central venous lines in neonates: a study of 2186 catheters. *Arch Dis Child Fetal Neonatal Ed* 2004; **89**: F504-508.

Paul M Farry and Anne Paterson

Department of Radiology  
Royal Belfast Hospital for Sick Children  
180 Falls Road  
Belfast BT12 6 BE

Address correspondence to: Dr Anne Paterson

Email: [annie.paterson@belfasttrust.hscni.net](mailto:annie.paterson@belfasttrust.hscni.net)