

Permanent catheter drainage system for palliation of diuretic-resistant cardiac ascites

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Abstract

We report the case of a 69-year-old man with dilated cardiomyopathy treated with a permanent catheter drainage system for diuretic resistant cardiac ascites. At 1 year follow-up, the patient had no heart failure related hospitalisations, displayed improved quality of life measures and had incurred no complications related to the catheter. Permanent tunnelled catheters are widely used to treat malignant ascites but may also be considered for palliation of cardiac ascites.

Keywords Heart failure; Ascites; Peritoneal drain

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Introduction

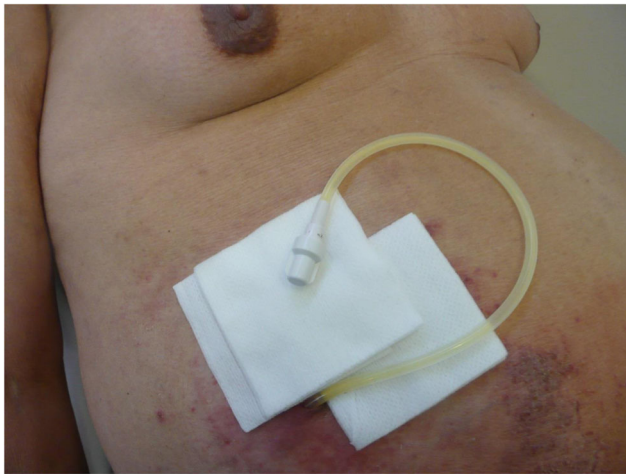
Heart Failure (HF) is a complex clinical syndrome, often difficult to manage and associated with poor outcomes. Predictors of morbidity and mortality include older age (greater than 60 years), reduced left ventricular ejection fraction <45%, diabetes mellitus, male sex, prior HF hospitalisation and higher New York Heart Association (NYHA) class.¹ We describe the case of a 69-year-old man with dilated cardiomyopathy admitted electively for permanent peritoneal catheterisation (Pleurx catheter) in December 2013 for relief of cardiac ascites. The patient first presented to the local cardiology service in 1999 with exertional dyspnoea on a background of previously good health. Echocardiography revealed severe global impairment of systolic function (ejection fraction 22%), left ventricular end-systolic diameter 60 mm and a dilated right heart. There was a family history of young cardiac death in a brother aged 26 years. The patient had no other risk factors for coronary heart disease. He was initially treated with diuretic therapy and angiotensin-converting-enzyme inhibitors, which were subsequently discontinued and replaced with an angiotensin receptor antagonist. Following an episode of atrial fibrillation, the patient was offered anticoagulation with warfarin, transiently treated with amiodarone and then with a cardioselective beta-blocker plus spironolactone. He underwent cardiac catheterisation studies that confirmed a globally hypokinetic left ventricle with unobstructed coronary arteries.

The patient initially responded well to medical management but at a follow-up in October 2012, he reported increasing breathlessness (NYHA class III). Electrocardiogram showed sinus rhythm, left bundle branch block morphology with prolonged QRS duration of 150 ms. He underwent cardiac resynchronisation therapy in December 2012, but despite a brief improvement in symptoms, he returned in June 2013 with peripheral oedema and ascites. Medical therapy was optimised at this time including furosemide 120 mg daily, bendroflumethiazide 2.5 mg daily, eplerenone 25 mg daily, carvedilol 12.5 mg twice daily, irbesartan 300 mg daily, ivabradine 5 mg twice daily and warfarin.

In July 2013, the patient was admitted to our hospital as an emergency for therapeutic drainage of 4.5 L of ascites. Non-cardiac causes of ascites were excluded. The patient was admitted on five further occasions for intravenous furosemide infusions over the next 4 months and for paracentesis of 4 L ascites on one occasion. He reported poor quality of life during this period (NYHA class IV) and was seen by the local palliative care service.

Case Report

On the 18th of December 2013, after discussions with the patient and appropriate consent, we inserted a PleurX catheter

Figure 1 PleurX drain 12 months after insertion.

(Figure 1). These catheters are approved by the English National Institute for Health and Clinical Excellence (NICE) for drainage of malignant ascites. The NICE technology appraisal concluded that the drainage system is a safe and effective palliative therapy with potential to improve quality of life and offer cost savings compared with large volume inpatient paracentesis.² Use of PleurX catheters has been reported for cardiac pleural effusions in five patients by Herlihy *et al.*³ with two patients incurring empyema after prolonged use, although experience of their use in malignant ascites suggests complication rates are low.^{4,5} There are published reports of use of tunneled catheters for cardiac ascites in seven patients.^{6,7} The catheter was inserted under ultrasound guidance on our medical admissions unit. After infiltration with local anaesthetic, it was tunneled subcutaneously, a polyester cuff sited within the tunnel preventing displacement of the catheter. The external end of the catheter has a safety valve to prevent fluid leakage or entry of air with a cap protecting the valve. The procedure was completed without complication, and the patient was discharged the following day.

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At 1 year follow-up, the patient has had no HF related hospital admissions. He performed home drainage of between 2 and 4 L of ascites per week. Peripheral oedema had resolved, and diuretic therapy had been reduced. Biochemical indices had improved slightly, estimated glomerular filtration rate increasing from 46 mL/min/1.73 m² in December 2013 to 54 mL/min/1.73 m² in September 2014. N-terminal pro-brain natriuretic peptide levels had fallen from 5420 pg/mL in September 2013 to 3990 pg/mL in September 2014. Non-invasive cardiac output (measured by transthoracic impedance cardiography⁸) improved from 4.5 L/min to 5.4 L/min within 8 months of catheter insertion. Health related quality of life measures and activity levels have also improved (NYHA Class II). There have been no incidences of catheter related infection or other complications.

Discussion

The management of end-stage cardiac failure can be challenging, particularly in the presence of renal impairment and hypotension.⁹ Cardiac transplantation can be considered for suitable candidates, and intermittent outpatient ultrafiltration has shown promise for unstable patients.¹⁰ We propose that permanent tunneled catheter drainage is a further therapeutic option for palliation of cardiac ascites, although more experience may be needed before it can be widely recommended for this indication. Potential benefits include reduced health expenditure and greater convenience for the patient compared with in-patient admissions for intravenous diuretics and paracentesis. Long term complication rates are unknown.

Conflicts of interest

The authors declare no conflict of interest.

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