

failure was controlled. Variables were reassessed at two, four, eight, and 12 weeks.

The patients tolerated the first dose of captopril well, showing a mild transient hypotensive response. One patient had a notable hypotensive response to the first dose but was asymptomatic and improved when her legs were raised. Twelve patients who were taking captopril three times daily at eight weeks had the regimen changed to twice daily. At 12 weeks the median dose of captopril was 75 mg daily in two divided doses.

The table shows the haemodynamic measurements at the start and end of the study. The cardiac variables showed a significant improvement, but there was no significant difference between the variables measured when patients were taking captopril three times daily and those when they were taking it twice daily. Four

*Means (SD) of important variables measured at beginning and end of 12 week study*

	Beginning of study	End of study	Significance
Cardiac index (l/min/m <sup>2</sup> )	2.21 (0.35)	3.09 (1.00)	p<0.005
Stroke volume index (ml/min/m <sup>2</sup> )	28.04 (5.70)	39.32 (16.20)	p<0.005
New York Heart Association class	2.61 (0.78)	1.67 (0.49)	p<0.005

patients showed little or no improvement in haemodynamic variables and some required a higher dosage of diuretic. There were no significant changes in plasma electrolyte, urea, or creatinine concentrations. Five patients developed minimal and fluctuant proteinuria. The mean weight fell from 60.5 kg at the start of the study to 58.3 kg at 12 weeks, but this change was not significant. There were no side effects. Many subjects reported a sense of improved wellbeing, and this observation concurs with those of other workers.<sup>2</sup> Some subjects initially gained weight after starting to take captopril; this has been noted by other workers<sup>3</sup> and did not require alteration of the diuretic dose.

### Comment

This study shows that captopril is well tolerated by the elderly and results in an apparent improvement in the symptoms and variables of cardiac function when taken twice daily. Further studies in this age group are needed to clarify the role of this promising drug.

E R Squibb and Sons Limited supplied the drugs for this study.

- 1 Robinson PS, Crowther A, Jenkins BS, Webb-Peploe MM, Coltart DJ. Instruments and techniques: a computerised dichromatic earpiece densitometer for the measurement of cardiac output. *Cardiovasc Res* 1979;13:420-6.
- 2 Bayliss J, Norell MS, Canapa-Anson R, Reid C, Poole-Wilson P, Sutton G. Clinical importance of the renin angiotensin system in chronic heart failure: double blind comparison of captopril and prazosin. *Br Med J* 1985;290:1861-5.
- 3 Cleland JGF, Dargie HJ, Hodsman GP, et al. Captopril in heart failure: a double blind controlled trial. *Br Heart J* 1984;52:530-5.

(Accepted 30 April 1986)

Department of Geriatric Medicine, University College Hospital Medical School, St Pancras Hospital, London NW1 0PE

PATRICK J MURPHY, MB, MRCP, senior registrar  
TISCHA VAN DER CAMMEN, MD, research fellow  
JAMES MALONE-LEE, MB, MRCP, senior lecturer

Correspondence to: Dr Malone-Lee.

## Cannulation of difficult oesophageal strictures with angiographic catheters

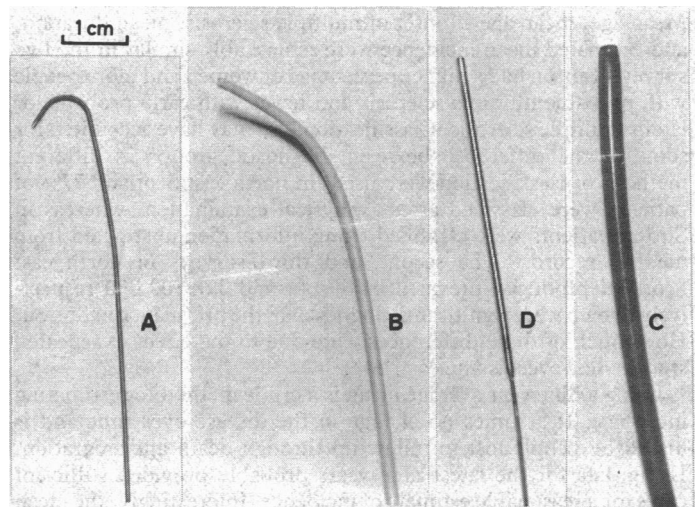
Many non-operative techniques to relieve dysphagia due to benign or malignant oesophageal strictures have been described,<sup>1</sup> but the most widely used is peroral dilatation with or without intubation of the stricture once a guide wire has been passed under direct vision using a fiberoptic endoscope. Roughly 3-10% of strictures, however, remain impassable,<sup>2</sup> requiring laparotomy and gastrostomy for a traction technique with its attendant morbidity and mortality of 18-33%.<sup>3,4</sup> We describe a method of cannulation of these difficult strictures with radiographic control.

### Patients, methods, and results

Over the last 12 months endoscopic dilatation of 158 benign and malignant oesophageal strictures was attempted. In seven cases a guide wire could not be

passed through the stricture despite radiographic screening, and these patients proceeded to the angiographic catheter technique described below. Three strictures were due to oesophageal carcinoma, two were benign, one occurred after insertion of an Angelchik prosthesis, and one was due to extrinsic mediastinal node compression.

A 3 mm J guide wire 145 cm long with a steerable core (William Cook, Europe) is introduced into the upper oesophagus (figure, A). Either the wire is passed through the channel of an endoscope or the control catheter can be used to give it sufficient stiffness. A multipurpose 6.5 French torque control catheter (B) is then introduced over the guide wire, and with the wire just protruding from the catheter tip the stricture is gently probed. Often the wire slips easily through into the stomach, but if it does not it should be withdrawn and water soluble contrast (Conray 280, 10-20 ml) injected down the catheter to delineate the stricture. Tilting the table head up helps the contrast to run through the stricture, and the guide wire can then be passed into the stomach. The multipurpose catheter is then removed and an Amplatz dilator, 80 cm long (C), is passed over the wire into the stomach. This dilator is not tapered but, with the J wire removed, allows a heavy duty endoscopy guide wire (D) to be passed. The Amplatz dilator is removed, and dilatation can proceed in the usual manner.



J guide wire (A) for cannulating stricture used with multipurpose torque control catheter (B) if required; larger bore Amplatz catheter (C) introduced over (A) then admits endoscopy guide wire (D).

Cannulation of all seven strictures was achieved using this technique and was followed by successful dilatation, and by immediate intubation in one case. No patient sustained a perforation of the oesophagus during cannulation or subsequent dilatation and intubation. Five patients were discharged within three days; all had symptomatic relief of their dysphagia and were able to take a soft diet. Two patients died from carcinomatosis shortly after their strictures were relieved.

### Comment

This new method of cannulating oesophageal strictures with a steerable angiographic guide wire passed under radiographic control was successful in seven consecutive strictures that were impassable at endoscopy; laparotomy, with its attendant high morbidity and mortality, was thus avoided. The procedure is simple and can be performed in any endoscopy suite with radiographic screening facilities or in radiology departments.

- 1 Earlam R, Cunha-Melo JR. Benign oesophageal strictures: historical and technical aspects of dilatation. *Br J Surg* 1981;68:829-36.
- 2 Angorn IB, Hegarty MM. Palliative pulsion intubation in oesophageal carcinoma. *Ann R Coll Surg Engl* 1979;61:213-4.
- 3 Angorn IB, Hegarty MM, Baker LW. Palliative intubation and resection in oesophageal carcinoma. *J R Coll Surg Edinb* 1977;22:325-31.
- 4 Johnson IR, Balfour TW, Bourke JB. Intubation of malignant gastro-oesophageal strictures. *J R Coll Surg Edinb* 1976;21:225-88.

(Accepted 1 May 1986)

Departments of Gastroenterology and Diagnostic Radiology, Royal United Hospital, Bath BA1 3NG

MANDY S SHARPE, MRCP, medical registrar  
A H CHALMERS, FRCP, consultant radiologist  
K R GOUGH, FRCP, consultant physician

Correspondence to: Dr Gough.