

(9.4%) or surgical gastrostomy (19.9%). The success rate of radiological gastrostomy is 99.2%, compared with 95.7% for endoscopic placement.

Radiological gastrostomy requires minimal sedation and is preferable to endoscopic gastrostomy, particularly in patients who are prone to aspiration (such as those with dysphagic stroke in Norton and colleagues' study), as the endoscopic method often requires heavy sedation if placement of the tube into the jejunum is considered.¹ The tube can be placed in the jejunum easily and rapidly when the radiological method is used, with no additional discomfort to the patient. Unlike with the endoscopic method, the colon can be routinely visualised during radiological gastrostomy so that inadvertent perforation of the colon when it is interposed between the stomach and anterior abdominal wall is avoided. Infection at the site of the tube is less common with the radiological method as the tube is introduced through the surgically scrubbed anterior abdominal wall rather than the contaminated oral cavity.⁴

Since radiological gastrostomy has been found to be the safest and most successful method of placing a gastrostomy tube it should be the method of choice in almost every circumstance.

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1 Norton B, Homer-Ward M, Donnelly MT, Long RG, Holmes GKT. A randomised prospective comparison of percutaneous endoscopic gastrostomy and nasogastric tube feeding after acute dysphagic stroke. *BMJ* 1996;312:13-6. (6 January.)

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Mortality associated with nasogastric tube feeding was high

EDITOR,—B Norton and colleagues suggest that percutaneous endoscopic gastrostomy feeding is superior to nasogastric tube feeding in patients with dysphagic stroke.¹ Since their conclusions are likely to have a considerable impact on clinical practice we wish to raise several concerns about the study.

Firstly, we are concerned that decisions about providing nutritional support to these patients were not made for two weeks after admission. As it is stated that intravenous fluid was the patients' sole nutritional intake before they entered the study, their nutritional status may have deteriorated considerably before nutritional support was started.² Furthermore, the patients were then fed with starter regimens. Such practice has not been shown to offer any advantages over the institution of full feeding from day 1, and, indeed, the use of starter regimens has been shown to reduce nutritional intake significantly.³

Another of our concerns is that the resiting of inappropriately removed nasogastric feeding tubes was delayed (range 1-10 days, median 5). This delay will almost certainly have led to an inappropriate reduction in the patients' nutritional intake.

The mortality of 57% in the group fed nasogastrically is higher than that reported in other studies (0% to 11%).^{4,5} The fact that three patients in the group receiving percutaneous endoscopic gastrostomy feeding regained their ability to swallow while none in the group fed nasogastrically

did so suggests that, despite the use of standard scoring systems, the patients in the two groups may not have been comparable neurologically.

Finally, we question the practical and clinical importance of the differences in discharge rates between patients with a percutaneous endoscopic gastrostomy and those fed by a nasogastric tube. The differences may simply represent a bias by community services to accept only patients with a percutaneous endoscopic gastrostomy. As the paper shows, patients with a percutaneous endoscopic gastrostomy are often easier to manage and feed and require less nursing time than those fed by a nasogastric tube, and thus we are sympathetic to the preference of wards and nursing homes for a patient with dysphagia to have a percutaneous endoscopic gastrostomy.

In our opinion, the authors' conclusion that percutaneous endoscopic gastrostomy tube feeding is superior to nasogastric tube feeding in patients with dysphagic stroke is premature and a larger comparison of the two methods is indicated. At the moment, the data suggest to us that at a relatively late stage after dysphagic stroke percutaneous endoscopic gastrostomy feeding is superior to rather inadequately managed nasogastric tube feeding.

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Study's methods were inadequate

EDITOR,—I do not believe that the results of B Norton and colleagues' small study comparing nasogastric tube feeding and percutaneous endoscopic gastrostomy feeding in patients with dysphagia after stroke are justified.¹

Firstly, the methodology is inadequate: although computed tomography was performed in 25 of the 30 cases, the findings are not reported. Surely the extent of the stroke (was it haemorrhagic or ischaemic?) is important. Neither can it be assumed that the pathology in the five patients who did not undergo computed tomography was also that of a hemispheric stroke. The Barthel activities of daily living index is probably too coarse a measure in patients with severe disability: it does not allow for interpretation of the clinical neurological findings. No attention is paid to the level of consciousness in either group or to the existence of any coincidental medical conditions that might have an effect on nutrition or mortality.

Secondly, the use of discharge from hospital as a measure of success of the feeding regimen without mention of the extent of neurological recovery is pure extrapolation of data. Norton and colleagues fail to notice that ability to swallow was regained in more patients in the gastrostomy group, which suggests that their strokes were less severe in neurological terms, and this would therefore have implications for long term prognosis.

Finally, it must be debatable whether one

method of feeding is more likely to result in bronchopneumonia than another when no attempt is made to assess the degree of aspiration. The authors do not mention that aspiration of the patient's own secretions may be responsible for bronchopneumonia, and this is likely to depend on factors other than the method of feeding, such as level of consciousness or coexistent illnesses.

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Authors' reply

EDITOR,—Kate Mackay raises concerns about long term outcome, and we are continuing to monitor the quality of life of our patients. The ethical dilemmas should be no different for either method of feeding. Percutaneous endoscopic gastrostomy tubes can be easily removed endoscopically or, in some cases, with external traction. The legal considerations of withdrawing nutritional support must always be borne in mind.

David G Smithard and Jean Kerr and colleagues can be reassured that our patients were assessed by qualified speech therapists; we should have made this clear in our paper. Brian L Murphy and colleagues state that radiological placement of gastrostomy tubes is superior to endoscopic placement. Endoscopic placement is equally safe, and other studies have suggested a much lower complication rate (1.4% for major complications¹) than the 9.4% quoted in their letter.

H D Duncan and colleagues and Kerr and colleagues are surprised that the feeding of patients with stroke can be delayed for several weeks. In our experience this is not unusual and is another consequence of the low profile given to nutritional support in the NHS. We do not know the ideal time after a dysphagic stroke when percutaneous endoscopic gastrostomy feeding should be introduced but agree that earlier feeding is almost certainly indicated.

Duncan and colleagues express surprise at the high mortality in the group fed nasogastrically (57%) compared with that in other studies.^{2,3} If they had read these other papers more carefully they would have noticed that the series included patients with a wide variety of neurological disorders, including motor neurone disease and cerebral palsy. Comparisons should be made with the six week mortality after acute dysphagic stroke, which has been quoted as almost 50%.⁴

We are surprised that Kerr and colleagues found the statistical interpretation of our study difficult. If there is a genuinely significant difference between two sets of data this can usually be shown by simple tests; more esoteric methods are often used to squeeze out a significant difference that might not otherwise exist. A larger study is, however, required, and we are pleased that this is being undertaken by Kerr and colleagues.

Finally, we remain puzzled by Thomas Esmonde's conclusions with respect to the findings on computed tomography. The recovery of swallowing in the patients given percutaneous endoscopic gastrostomy feeding is more likely to represent part of an overall improvement secondary to better nutrition. We still conclude that percutaneous endoscopic gastrostomy feeding is the preferred method of nutritional support after acute dysphagic stroke.

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