common bile duct with insertion of a T tube. An elderly patient (case 10) underwent an emergency cholecystostomy for biliary peritonitis secondary to a perforated gall bladder. Subsequent tube cholangiograms in all patients showed stones in the common bile duct with diameters ranging from 2 mm to 8 mm. All patients received prophylactic antibiotics before being given 2 mg/kg/min ceruletide (Farmitalia) dissolved in isotonic saline intravenously over an hour. An average of 1–5 litres of saline (range 0.2–2.5 litres) was infused through the T tube at a pressure of 25–33 cm of water, though in one patient the pressure reached 50 cm of water without ill effects.

Common bile duct stones were successfully removed after one attempt in three patients. Two of these patients also had hepatic duct stones greater than 1 cm in diameter, which remained unchanged. The technique was twice attempted unsuccessfully in one patient (case 6). His cholangiograms showed a mobile stone less than 6 mm in diameter with free flow of contrast through a normal sphincter. Side effects were minimal, consisting of vomiting during the procedure in two patients and diarrhoea in a further two patients. Subsequent management of the unsuccessful group consisted of endoscopic retrograde cholangiopancreatographic examination and sphincterotomy in four patients, extraction through the T tube tract in two, and re-exploration and choledochoduodenostomy in one patient (case 10).

### Details of patients and outcome of treatment with ceruletide

<table>
<thead>
<tr>
<th>Case No</th>
<th>Sex</th>
<th>Age (years)</th>
<th>Stone size (mm)</th>
<th>Volume of saline infused (l)</th>
<th>Outcome</th>
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<tr>
<td>1</td>
<td>F</td>
<td>57</td>
<td>7,4</td>
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<td>2</td>
<td>F</td>
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<td>5</td>
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<td>Successful</td>
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<tr>
<td>3</td>
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<td>74</td>
<td>8</td>
<td>0</td>
<td>Successful</td>
</tr>
<tr>
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<td>M</td>
<td>55</td>
<td>4</td>
<td>1</td>
<td>Successful</td>
</tr>
<tr>
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</tr>
<tr>
<td>6</td>
<td>M</td>
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<td>2.5</td>
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<tr>
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<td>F</td>
<td>34</td>
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<tr>
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<td>Multiple</td>
<td>2-4</td>
<td>0</td>
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</table>

### Comment

In patients with common bile duct stones some small retained stones may pass spontaneously. For those that remain mechanical means of removal are increasingly used, but there is still a need for a simpler technique that may be tried initially. The use of ceruletide is theoretically attractive as it has been shown to relax the normal sphincter considerably. We results are disappointing, with successful removal of stones occurring in only three patients (33%). This is probably no better than might be expected from usual stone alone. As this technique appears to be safe, simple, and relatively cheap it may, however, be a reasonably initial option, although more research is needed to establish its value.

We thank Farmitalia Carlo Erba for supplying the ceruletide.


### An unusual oesophageal obstruction during nasogastric feeding

It is our policy to start nasogastric feeding in patients whom we think will be ventilated for a long time and who clinically have normal bowel function. We report an unusual case of oesophageal obstruction during nasogastric feeding.

#### Case report

A 74 year old man sustained a fractured femur and tibia and flail chest in a road traffic accident. He was admitted to the intensive care unit, ventilated, and given an intravenous infusion of papaveretum. He had undergone a Polya gastrectomy 15 years previously.

On the third day after admission bowel sounds were present and nasogastric feeding was begun with an infusion of Osmolite suspension (Abbott Laboratories Ltd) through a 14 French gauge nasogastric tube. The rate and strength of feeding were increased with no problems until he was receiving full strength feed at 60 ml/h. On the sixth day he was noted to be regurgitating feed into the oropharynx. The nasogastric tube was found to be blocked and was removed. Attempts to reinsert another were unsuccessful, the tube being noted on plain chest radiograph to coil in the lower oesophagus. An injection of Gastrografin through this tube showed complete obstruction of the lower third of the oesophagus (fig).

Fibreoptic oesophagoscopy showed the obstruction to be caused by a white caseous substance, of the consistency of firm cream cheese. This material could not be removed with the fibroptic instrument. Rigid oesophagoscopy showed the entire lower third of the oesophagus and the gastric remnant to be blocked with it. Considerable time was spent in breaking it with biopsy forceps and using suction and washouts, although it was not adherent to the mucosa of the oesophagus and stomach. Macroscopically the solid material had the same appearance as clotted Osmolite produced in the laboratory. Gastrojejunostomy, after removal of the material showed a normal gastric remnant with no evidence of outflow obstruction, ulceration, or inflammation. A feeding tube was inserted into the efferent loop of the gastrojejunostomy over a guide wire, and the next day feeding was successfully restarted with milk feed suspension (Roussel Laboratories Ltd).

### Laboratory tests—We could only conclude that the obstruction had been caused by solidified Osmolite suspension as the patient had received only this suspension for nine days. To elucidate why, several in vitro investigations were performed. Sodium hydroxide or hydrochloric acid was added to full strength Osmolite suspension in Universal plastic containers to alter the pH. The containers were incubated overnight at 37°C, as was a control container of the suspension. The natural pH of the feed was found to be 6. The control suspension and those with a pH of 5, 8, and 9 all remained homogeneous and liquid. At pH 4 the Osmolite
clotted within 30 minutes and had separated after overnight incubation. At pH 1 it solidified instantly, later to separate. In further testing to establish why this did not happen in vivo Osmolite was mixed with pepsin and adjusted to pH 1. The mixture became frothy, and solidification was considerably inhibited. A gastric aspirate from the patient was found to be pH 4.

Comment
Our in vitro tests showed that Osmolite suspension solidified at a low pH; it had the same macroscopic appearance as the clotted material removed from the patient, which was not analysed further. In vitro tests also showed that the solidification of Osmolite was prevented by a high concentration of pepsin. In patients with a partial gastroscopy the pepsin concentration is reduced and digestion therefore impaired, and thus the gastric pH may be low enough to cause solidification. This would be enhanced by slow gastric emptying, which occurs when opiates are given and after major trauma.

Nasogastric feeding is by no means free of complications, but we do not think that this serious unusual complication has been reported before.

We thank Dr A K Wielogorski and Mr F Shaboo for their permission to report on one of their patients and Dr P O’Gorman, consultant pathologist, for his help and advice.


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A complication of capillary glucose monitoring

I describe a patient with diabetes mellitus who developed infected gangrene of the tip of one finger, caused by multiple stabs to monitor capillary glucose concentrations.

Case report
A 66 year old man was transferred to the department of medicine for the elderly for rehabilitation after a stroke. He had suffered from diabetes mellitus for 14 years, controlled with diet alone but complicated by early proliferative retinopathy and nephropathy. After the stroke he had received tolbutamide 500 mg twice daily, and his average blood glucose concentration fell from 14 to 8 mmol/l (252 to 144 mg/dl).

Assessment on transfer showed that he still had a pronounced left sided hemiparesis. He had peripheral vascular disease affecting his legs but no peripheral neuropathy. He also had evidence of small vessel disease affecting his fingers and hands. Examination of the fundi showed background retinopathy on the left side and early proliferative retinopathy on the right side.

Over the next few weeks he complained increasingly of pain at the tip of the little finger on his right hand, the site of multiple stabs to obtain samples of capillary blood to assess his diabetic state. These stabs were performed by nursing staff, using either a lancet or a disposable 25 gauge needle without the guidance of a device such as an Autolet, which limits the depth of penetration of a lancet; all methods are described as being safe and efficient. 1

In particular, Judd and Sønksen emphasised that pulp infections have not yet been encountered in many thousands of finger pricks.2 Two cases of finger sepsis have, however, occurred in patients with shunts in their arms for haemodialysis.3 Infection of the flexor tendon sheath has also been reported.4

The complication that the patient in this study experienced is considered unusual. The pulp infection and gangrene could have occurred for several reasons...