A skull fracture is associated with an intracranial mass lesion in three quarters of patients.³ Absence of a fracture does not exclude serious head injury: 35% of patients in coma and 20% of those dying after head injury do not have a skull fracture.³ Computed tomography is mandatory for head injured patients in coma (Glasgow coma scale 8), and measurement of intracranial pressure may be useful. Half of head injured patients admitted in coma have a raised intracranial pressure, and intracranial pressure is raised in 30% of cases without haematoma.⁴ Raised intracranial pressure is also a feature of severe near drowning, reflecting the primary hypoxic insult. When the intracranial pressure is greater than 20 mm Hg after near drowning outcome is poor (death in 70% of patients, a vegetative state in 30%).⁵

In our patient attributing the neurological signs to severe head injury led to unnecessary monitoring of intracranial pressure and might have led inexperienced staff to diagnose post-traumatic brain stem failure and withdraw supportive treatment. When examining unconscious patients the core temperature should be measured and clinical signs interpreted accordingly.

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Timing of disc surgery after iohexol myelography and its effect on the incidence of postoperative problems

A recent study by Lynch and Dickson showed a significantly higher incidence of postoperative headache and nausea in patients undergoing discectomy within 48 hours of metrizamide myelography than in those whose operation was delayed for at least a week.¹ Iohexol causes fewer adverse reactions after myelography than metrizamide,² and we believed that this also applied after surgery. We therefore investigated the effect of the time interval between myelography and surgery on the incidence of postoperative problems in patients in whom iohexol had been used as the contrast medium.

Patients and methods

Thirty eight consecutive patients with low back pain and sciatica due to lumbar intervertebral disc prolapse who failed to respond to conservative measures were studied prospectively. Myelography was carried out using iohexol. After the procedure the patients were kept sitting up for six hours and remained on bed rest for at least a further 18 hours (if not operated on within that time).

The disc was subsequently excised through an interlaminar approach with the patient in the knee-elbow position. After the operation the presence or absence of headache, nausea, and urinary retention was recorded each day until the patient was discharged. The timing of the operation was determined solely by the availability of theatre time.

Results

The table shows the number of patients complaining of headache, nausea, and urinary retention on the first day after operation. The results were analysed with the exact probability test using different definitions of the early and late operations.

More patients operated on early had headaches on the first day after operation, but this difference was significant only when early operations were defined in one or other of two ways—namely, those performed on the day after the myelogram ($p=0.027$) or those performed during the first three days after the myelogram ($p=0.046$).

The number of patients with headaches after operation in the early operation group was significantly greater ($p=0.042$) than the number with headaches after

myelography alone (who were awaiting surgery), which suggested that the increased incidence was due to the operation and not simply to the after effects of the myelogram.

Comment

Adverse reactions after myelography are significantly reduced when iohexol rather than metrizamide is used as the contrast medium.² If the contrast study is to be implicated in the production of symptoms in the postoperative period, as suggested by Lynch and Dickson,¹ then the incidence of such symptoms should be reduced by using iohexol in preference to metrizamide. Furthermore, the timing of operations after myelography may be less important in preventing postoperative problems.

Incidence of headache, nausea, and urinary retention on the first day after operation

No of days between myelogram and operation	Total No of patients	No of patients with		
		Headache	Nausea	Urinary retention
1	7	4	2	0
2	4	0	2	0
3	1	1	1	1
4	3	0	0	0
5	5	1	0	1
6	4	0	0	0
≥7	14	1	6	2

Our results show that the only significant difference between patients operated on early and those operated on late was in the incidence of headache on the first day after operation. The headache was not severe in any of the patients, and we do not believe that there is sufficient indication to delay surgery if theatre time is available soon after myelography has confirmed the diagnosis. Such a delay would merely increase the length of time the patient has to suffer sciatic pain.

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Ceruletide for retained biliary stones

The incidence of retained biliary stones after exploration of the common bile duct has been reported as 4.3%.¹ Initial therapeutic options include conservative management, perfusion techniques using the T tube, and mechanical means. The use of saline alone to flush out small stones may be successful. Solvents such as cholate or mono-octanoate are more reliable but may have serious side effects.² Stones may be extracted through the matured T tube tract or at endoscopic sphincterotomy, which has been reported to be successful in 85% of patients but is not universally available, may be technically difficult, and has potentially serious side effects.³

We describe our experience of a new perfusion technique that has previously been used successfully in four patients.⁴ Intravenous ceruletide exerts a cholecystokinetic action on the sphincter of Oddi, promoting relaxation and allowing increased volumes of saline to be infused through the T tube to flush out retained stones.

Patients, methods, and results

We have used this technique on 11 occasions in 10 patients over a year (table). All patients except one had undergone cholecystectomy and exploration of the

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 ng/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

Details of patients and outcome of treatment with ceruletide

Case No	Sex	Age (years)	Stone size (mm)	Volume of saline infused (l)	Outcome
1	F	57	7, 4	2.0	Unsuccessful
2	F	40	5	1.8	Unsuccessful
3	M	74	8	0.2	Unsuccessful
4	M	55	4	1.8	Unsuccessful
5	F	40	4	1.0	Unsuccessful
6	M	68	5	2.5, 2.0	Unsuccessful
7	F	34	6	1.0	Successful
8	F	44	7	1.5	Successful
9	M	54	5, 4	2.0	Successful
10	F	86	Multiple: 2-4	0.5	Unsuccessful

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).

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.⁵ Our results are disappointing, with successful removal of stones occurring in only three patients (33%). This is probably no better than might be expected from using saline alone. As this technique appears to be safe, simple, and relatively cheap it may, however, be a reasonable initial option, although more research is needed to establish its value.

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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 radiography to coil in the lower oesophagus. An injection of Gastrografin down this tube showed complete obstruction of the lower third of the oesophagus (fig).

Chest radiograph after injection of Gastrografin through nasogastric tube.

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 fibreoptic 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 Clinifed 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