- ⁴ DeDombal, F T, *et al*, *Gut*, 1974, **15**, 435.
⁵ Farmer, R G, Hawk, W A, and Turnbull, R B, *Gastroenterology*, 1975, **68**, 627.
⁶ Greenstein, A J, *et al*, *Medicine (Baltimore)*, 1976, **55**, 401.
⁷ Greenstein, A J, *et al*, *New England Journal of Medicine*, 1975, **293**, 685.
⁸ Truelove, S C, and Pena, A S, *Gut*, 1976, **17**, 192.
⁹ Allan, R, *et al*, *Gastroenterology*, 1977, **73**, 723.
¹⁰ Burke, B S, *Journal of the American Dietetic Association*, 1947, **23**, 1041.

- ¹¹ Paul, A A, and Southgate, D A T, (editors), *McCance and Widdowson's The Composition of Foods*. London, HMSO, 1978.
¹² Fielding, J F, Cooke, W T, and Alexander-Williams, J, *Surgery, Gynecology and Obstetrics*, 1972, **134**, 467.
¹³ Alexander-Williams, J, Fielding, J F, and Cooke, W T, *Gut*, 1972, **13**, 973.
¹⁴ Nygaard, K, and Fausa, O, *Scandinavian Journal of Gastroenterology*, 1977, **12**, 577.
¹⁵ Southgate, D A T, Bingham, S, and Robertson, J, *Nature*, 1978, **274**, 51.

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Fibreoptic injection of oesophageal varices

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Summary and conclusions

A new technique for injecting sclerosant into oesophageal varices uses a flexible gastroscope. Once the gastroscope has been inserted a flexible tube with a window cut into its distal end is pushed down over the gastroscope until a varix protrudes through the window. The varix can then be injected with a needle passed down the biopsy channel of the gastroscope. Once the varices have all been injected in this way the tube is advanced to compress the injection sites and so help control bleeding.

This method, using a flexible gastroscope, has proved easier and safer than the traditional method using a rigid gastroscope.

Introduction

The injection of a sclerosant into oesophageal varices is now well established in both emergency and elective cases.¹⁻³ The rigid oesophagoscope is usually used for such procedures,¹⁻⁴ but we describe here a new technique using a flexible gastroscope.

Instruments and technique

The instruments used are (a) a GIF K Olympus gastroscope, (b) a flexible 50-cm tube, and (c) a long flexible needle. The 50-cm tube has an internal diameter of 2 cm, and a window measuring 3 cm × 0.5 cm is cut 2 cm from the distal end of the tube. The tube is graduated at 5 cm intervals. The needle is a retractable oesophageal varices injection needle.

Technique—Before the gastroscope is inserted the tube is threaded over the instrument to its proximal end. Under general anaesthesia the gastroscope is inserted to the lower end of the oesophagus and the positions of the varices are noted (see figure, a). The tube is then gently slid down the outside of the gastroscope to the lower end of the oesophagus. When the tube is in the correct position a varix will protrude through the window. The varix is seen through the gastro-

(a) Tube ready to be pushed down gastroscope.

(b) Varix projecting through window ready for injection.

scope projecting into the lower end of the tube. The guarded needle is passed through the biopsy channel of the gastroscope, and up to 5 ml of ethanalamine oleate is injected into the varix (see figure, b). As the needle is withdrawn from the varix the tube is rotated until the adjacent varix protrudes. This procedure is repeated until all the varices have been injected. On completion of the injections the tube is advanced 5 cm to compress the injection sites. At this stage any residual blood in the stomach may be aspirated. It may occasionally be necessary to insert a Sengstaken-Blakemore tube at the completion of the procedure.

Discussion

There are two methods available for injecting oesophageal varices. The older technique uses a Negus oesophagoscope and the newer method a flexible gastroscope with an outer tube. Dissatisfaction with the former method led us to develop the latter.

The injection of varices with a flexible gastroscope but without an outer tube has several disadvantages. The main problem is bleeding, which tends to obscure vision. The outer sheath has eliminated this problem. It is now possible to isolate and see each varix clearly before injecting the sclerosant. Rotation of the

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tube compresses the site of injection and effectively maintains the sclerosant at the injection site and controls bleeding.

The insertion of a rigid oesophagoscope is occasionally difficult or even impossible, but this difficulty does not arise with the flexible gastroscope. We and others³ have also found that the rigid oesophagoscope perforates the oesophagus of an appreciable number of patients. In our series of 150 patients there have been no oesophageal perforations using the flexible gastroscope. The minor complications associated with oesophageal injection sclerotherapy are substernal pain, tachycardia, and an occasional small pleural effusion.

Our experience with both the rigid and the flexible instruments has shown that the flexible gastroscope with the outer tube provides an easier and safer method of injecting

oesophageal varices. An endoscopist will find little difficulty in mastering the technique.

The oesophageal tube was provided by KeyMed.

References

- ¹ Crafoord, C, and Frenckner, P, *Acta Oto-Laryngologica*, 1939, **27**, 422.
- ² Macbeth, R, *British Medical Journal*, 1955, **2**, 877.
- ³ Johnston, G W, and Rodgers, H W, *British Journal of Surgery*, 1973, **60**, 797.
- ⁴ Bailey, M E, and Dawson, J L, *British Medical Journal*, 1975, **2**, 540.
- ⁵ Terblanche, J, *et al*, *Surgery, Gynecology and Obstetrics*, 1979, **148**, 323.

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SHORT REPORTS

Pseudomonas meningitis treated with azlocillin

Infection of the brain or meninges by *Pseudomonas* species is rare, difficult to treat, and usually associated with neurosurgical procedures. We report a case with a remarkably long latent period of seven years between surgery and evidence of infection, which was successfully treated with a new antibiotic, azlocillin.

Case report

In 1971 a man aged 20 presented with headache of one month's duration and signs of a mass in the posterior fossa. A ventricular catheter and Rickham reservoir were placed through a frontal burr hole, and a ventriculogram showed a left cerebellar mass. A cystic cerebellar astrocytoma was completely excised. After a two-week course of ampicillin and cloxacillin he made an excellent recovery. In 1978 he was admitted with a three-week history of headache and of fever and photophobia for two days. His temperature was 39°C and he had a stiff neck. The lumbar cerebrospinal fluid (CSF) contained $195 \times 10^6/l$ ($195/mm^3$) white cells (half neutrophils and half lymphocytes). The CSF concentration of protein was 3 g/l and of sugar 3.9 mmol/l (70 mg/100 ml). Culture was sterile. The next day he felt better apart from persisting headache and was afebrile with no signs of meningitis. Fifteen days after admission his temperature rose to 39°C, his headache worsened, and he was given penicillin, cloxacillin, and chloramphenicol. Two days later *Pseudomonas aeruginosa* was cultured from lumbar CSF after 24 hours. On this occasion the CSF contained $250 \times 10^6/l$ ($250/mm^3$) white cells (65% neutrophils, 35% lymphocytes) and glucose concentration was 1.8 mmol/l (32 mg/100 ml) with a simultaneous plasma glucose concentration of 7.4 mmol/l (131 mg/100 ml). The Rickham reservoir was aspirated and large numbers of Gram-negative rods were seen on direct microscopy. The reservoir was removed and grew *Ps aeruginosa*. The fever settled over five days. The patient felt better until 12 days after removal of the reservoir, when he suddenly developed headache, vomiting, and a temperature of 37.5°C. This time the CSF contained $525 \times 10^6/l$ leucocytes ($525/mm^3$), mostly neutrophils. He was given azlocillin 5 g intravenously every six hours for 10 days. His symptoms abated. At the end of the 10 days he went home. He was back at work within a month. On the seventh day of treatment the CSF concentration of azlocillin was 5 µg/ml. The minimum inhibitory concentration (MIC) of the *Ps aeruginosa* was 1 µg/ml. This CSF contained only $30 \times 10^6/l$ ($30/mm^3$) lymphocytes, and sugar concentration was normal.

Comment

Pseudomonas species are rare primary pathogens in previously fit people. Nosocomial infections have often been associated with isolation of the organism from sinks, antiseptic solutions, or ward equipment.¹ The upper respiratory and urinary tracts are often colonised when selective pressure is exerted by giving broad-spectrum antibiotics to which the organism is resistant.^{2,3} The organism may be conveyed to the scalp and thence to the CSF via communicating wounds or drains.

Azlocillin, one of the ureido-penicillins,⁴ a recently developed group of antibiotics, has a wide spectrum of antibacterial activity. It is notably potent against *Pseudomonas* spp, the mode MIC being only 4 µg/ml. Like other penicillins its penetration into the CSF is related to

the degree of meningeal inflammation, but interestingly in our case of low-grade meningitis the concentration achieved, without recourse to intrathecal therapy, was five times the MIC of the organism. The most widely used anti-pseudomonal agent is gentamicin, but this penetrates poorly into the CSF and possibly bactericidal concentrations might be achieved only at the cost of damage to the eighth cranial nerve. Carbenicillin is only moderately active and penetrates CSF poorly, so that daily intrathecal therapy is essential. Azlocillin appears to be the agent of choice in this uncommon but serious infection.

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¹ Lowbury, E J L, and Fox, J, *Journal of Hygiene*, 1954, **52**, 403.

² Price, D J E, and Sleight, T D, *Lancet*, 1970, **2**, 1213.

³ Ayliffe, G A J, *et al*, *Lancet*, 1965, **2**, 365.

⁴ Ellis, C J, *et al*, *Journal of Antimicrobial Chemotherapy*, 1979, in press.

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Prediction of fetal sex: a cautionary tale

Amniocentesis, which is being performed increasingly, allows determination of the genotype of the fetus. A problem arises whether or not the mother should be told the sex of her fetus. This case shows that things are not always what they seem, and provides support for not telling the mother the sex of her fetus.

Case report

Amniocentesis was performed, because of maternal age, at 14 weeks on a 39-year-old woman in her fourth pregnancy. The amniotic fluid α -fetoprotein was normal, and the fetal genotype was 46XY. The mother did not want to know the sex of the infant and so was not told. She then gave birth at term to a phenotypically normal girl (weight 4.2 kg (9lb 4 oz)): the external genitalia were entirely normal and there were no hernias. Chromosome analysis confirmed the 46XY genotype and a buccal smear was chromatin negative. When the girl was 1 year old a human chorionic gonadotrophin (HCG) stimulation test raised the plasma testosterone concentration from a basal value of 0.2 nmol/l (0.06 ng/ml) to 6.4 nmol/l (1.85 ng/ml).

The chromosomes of two older sisters (both phenotypically normal girls) were analysed and the oldest one (13 years) was also found to be genotypically