Conclusion

The Doppler technique is easy to use, gives fairly reproducible results, and should prove useful in monitoring blood pressure of very ill neonates, e.g. with recurrent apnoeic attacks.

Summary

Mean systolic blood pressure estimated by the indirect Doppler technique, in a group of 35 preterm babies, was $71.0 \pm 1.3$ mmHg (SE).

We are grateful to Mrs. R. M. Ripley for statistical analysis.

References


J. A. Kuzemko,* S. Hircock, S. Fisher, J. Gashes, and L. Wells

Special Care Baby Unit, Maternity Unit, Aldermans Drive, Peterborough PE3 6JW.

*Correspondence to Dr J. Kuzemko.

Congenital oesophageal stenosis

Oesophageal atresia is a deformity which cannot be overlooked: congenital oesophageal stenosis presents less urgently and occurs more rarely but can still prove fatal. When the case described here was treated, the advice found in the literature was confusing, and it seemed worthwhile to record our experience.

Case history

A girl was born by spontaneous delivery at term on 3 July 1974 in Kirkwall, Orkney, after an uneventful second pregnancy. Her birthweight was 3800 g and she appeared healthy. 2 days after delivery the mother became febrile and on the next day the baby was also feverish. No abnormality was found until, after 2 weeks, serological evidence of herpes simplex infection in both mother and child was reported. Recurrent regurgitation of feeds occurred during the third and fourth weeks. By 8 August this had settled, the baby was well, afebrile, and weighed 3730 g.

On 20 August 1974 the baby was admitted to the Royal Aberdeen Children's Hospital because there was a tendency to choke on feeds and tenacious mucus was brought up. The baby looked well and weighed 4170 g. On 27 August a barium swallow (Fig. 1) showed a very short membranous narrowing at the level of T4 below which there was a widened area, followed by a stricture, 2.5 cm long. Below this area the oesophagus looked normal and there was no evidence of hiatus hernia, gastro-oesophageal

Fig. 1 Barium swallow of 27 August 1974 at age 7 weeks.
reflux, or fistulous connection with the bronchial tree. A provisional diagnosis of congenital oesophageal stenosis was made.

Oesophagoscopy on 30 August showed a normal oesophagus which suddenly narrowed to a small central orifice. This dilated up easily but immediately contracted to the original size on withdrawal of the bougie. A gastrostomy was constructed because by this time feeds taken by mouth were insufficient to maintain nutrition. It was decided to try weekly dilatation under anaesthesia. This was easy to do but there was no improvement in swallowing or in the appearance of the stricture in a barium swallow 5 weeks later.

In view of the ease with which the stenotic area could be dilated it seemed reasonable to try increasing the frequency of dilatation. To achieve this, on 4 October a length of braided nylon was tied to a fine catheter, passed through the stenosis into the stomach and retrieved through the gastrostomy. The two ends were brought together and an egg-shaped brass bead 2·5 mm in diameter tied in to form a continuous loop. This bead was drawn once daily, without analgesia, through the mouth down the oesophagus until it reached the stomach and was then drawn back until it emerged at the mouth. This caused minimal distress to the infant. The bead was taped to the skin of the chest between dilatations. Over the next 3 months the diameter of the bead was increased to 3·0, 3·5, and 4·0 mm by using new beads in acrylic. Oral feeding was continued but gastrostomy feeds had often to be given to make up the amount required. By the end of October almost all feeds were taken by mouth and cereal was started. On 15 November a further barium swallow showed marked improvement, but the stripping wave below the stenosis was noted to be poor. The gastrostomy tube was removed.

The baby's mother was taught the method of dilatation, and on 10 December mother and baby returned home and the mother continued the daily dilatations without difficulty.

In February 1975 the barium swallow showed a normal-looking oesophagus with rapid emptying even in the Trendelenburg position. It was decided that the 4 mm bead should be passed twice weekly and that all dilatation should cease in April. When the baby was seen on 13 May feeding was reported to be normal. Another barium swallow (Fig. 2) showed no deterioration so the nylon thread was removed and the gastrostomy allowed to close.

When last seen in July 1976 at the age of 2 years the child had swallowed a normal diet without difficulty and weighed 11·3 kg. A thick barium swallow showed no narrowing: in particular there was no evidence of oesophageal reflux.

Discussion

The incidence of congenital oesophageal stenosis lies between 1 in 20 000 and 1 in 30 000 births (Bluestone et al. 1969). Four forms are recognized, the simplest being membranous stenosis due to a mucosal diaphragm. There is segmental stenosis due to fibromuscular thickening of 1–2 cm of the midesophageal wall (Whipham and Fagge, 1905). These two forms may coexist as in this case, and in the fourth variety tracheobronchial remnants narrow the lower oesophagus (Deiraniya, 1974).
Clinical features. Regurgitation of undigested food usually begins within weeks or months of birth and choking often accompanies feeding. Difficulties may start when solid food is started or a foreign body is swallowed. Barium swallow shows segmental stenosis clearly, webs less so. It is essential to exclude the much commoner hiatus hernia with gastro-oesophageal reflux and oesophagitis (Dunbar, 1958).

Treatment. Membranous stenoses have often been dilated up or torn open by the beak of an oesophagoscope (Abel, 1928). Lower oesophageal webs often need resection, as do stenoses due to tracheobronchial remnants. Various procedures have been tried for segmental stenosis. Gross (1953) favoured repeated dilatation and gave one of his patients 91 anaesthetics to do this. Bouginage over a swallowed thread has been much favoured, and Ravitch (1962) suggested using a bead tied into a continuous thread loop, as we have done, though he found only a few dilatations were needed. Our experience of the failure of weekly dilatations led us to try a longer period of daily dilatation, and in fact we had 4 weeks before our patient fed normally. Dilatations were easily continued at home and proved safe and easy. The frequency of dilatation was gradually reduced and the effect assessed before removing the thread loop. Some surgeons advise thoracotomy and resection if a few dilatations have proved ineffective (Swenson, 1969), but the resilient nature of the stricture leads us to recommend perseverance with outpatient daily dilatation.

Summary

A case of congenital oesophageal stenosis presenting shortly after birth is reported. Treatment by daily dilatation with a bead on a continuous thread loop was carried out at home over several months. This proved to be a simple, safe, and effective treatment.

We thank Mr. T. McKay of the Dental Laboratory, Aberdeen Royal Infirmary, who made the acrylic beads.

References


DAVID VALERIO, PETER F. JONES,* and ARCHIBALD M. STEWART
Departments of Surgery and Radiology, Royal Aberdeen Children's Hospital, Cornhill Road, Aberdeen AB9 2ZG.

*Lack of effect of phototherapy on plasma cyclic-AMP in newborn infants

It is generally accepted that phototherapy is an effective means of lowering serum bilirubin levels in jaundiced newborn infants (Behrman, 1974). The mechanism by which phototherapy reduces bilirubin is not fully understood. In the human infants receiving phototherapy, bilirubin undergoes decomposition to a series of derivatives that are water soluble, and the plasma becomes progressively less yellow. These derivatives are not retained in the body, but are rapidly excreted in the bile and urine (Callahan et al., 1970). The use of phototherapy for the treatment of hyperbilirubinaemia has an exciting and more general implication. If light can be used to speed the destruction of bilirubin, it seems unlikely that light exposure will eventually be shown to influence plasma levels of other compounds. Light may be beneficial in many more situations than are now apparent, but it may also impair human health by destroying essential compounds or by generating toxic ones. The possibility that light may have effects on cellular activities needs to be investigated.

This study was carried out to determine whether plasma cyclic-AMP concentrations are altered in infants receiving phototherapy.

Material and methods

Ten newborns (6 males, 4 females) undergoing phototherapy were studied. Gestational ages ranged from 34 to 42 weeks and birthweights from 2500 g