

Clinical Workshop

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Prevention of Gastric Distention during Anesthesia for Newborns with Tracheoesophageal Fistulas

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The most common type of congenital esophageal atresia is a blind upper esophageal pouch with a fistulous tract extending from the lower esophageal segment to the posterior tracheal wall. This type of fistula presents certain anesthetic problems. Anesthetic gases can escape via the fistula into the stomach if intermittent positive pressure is applied to the airway, resulting in an excessive increase in intragastric pressure. Consequently, regurgitation and aspiration of acidic gastric juice may occur. If gastric distention is severe, respiratory embarrassment due to splinting of the diaphragm, and even circulatory failure, may supervene.¹

To avoid gastric distention, careful inflation of the lungs until the chest is open has been recommended.² The value of preoperative gastrostomy under local anesthesia has been emphasized.^{1,2} This provides for gastric decompression, allows intermittent positive-pressure ventilation during the repair, and reduces

the risk of regurgitation and aspiration of gastric contents into the lungs.^{1,4,5}

TECHNIQUE

The present report describes an additional safety measure in the anesthetic management of infants with tracheoesophageal fistulas. The technique is based on the fact that the distal esophageal segment usually communicates with the trachea slightly above the bifurcation. A tracheal tube placed distally would block the fistulous opening, allowing intermittent positive pressure to be used safely without producing gastric inflation.

To insure effective blocking of the fistula, a curved tracheal tube without a side hole was used in nine newborns with tracheoesophageal fistulas of the common variety. Six of the nine had gastrostomies preoperatively. Intubation was accomplished while the patients were awake. The tube was advanced until the tip was at the level of the carina or actually in the right main bronchus, then withdrawn 0.5 to 1 cm until breath sounds were heard bilaterally. Finally, the tube was positioned so that the bevel faced anteriorly and downward.

The efficacy of the block of the fistulous opening was tested by listening with a stethoscope over the left upper quadrant while applying intermittent positive-pressure ventilation. In patients with gastrostomies, the gas-

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trostomy tube was clamped during the test period. In no patient was entry of air into the stomach detected. The tracheal tube was then secured in place and the operation carried out in the usual manner. After closure of the fistula, the position of the distal end of the tracheal tube was checked by the surgeon and found in each case to be distal to the fistulous opening and actually blocking the opening in the trachea with its posterior surface (fig. 1).

COMMENTS

Most investigators feel that intermittent positive-pressure ventilation is indicated during repair of tracheoesophageal fistula.^{1,5} Our observations indicate that placing the tube distally in the trachea makes it possible to block the tracheal side of the fistula with the posterior wall of the tracheal tube, thus allowing intermittent positive-pressure inflation of the lungs without producing gastric distention. Infant-sized tracheal tubes with cuffs, which have been manufactured recently, may also be used for this purpose.^{6*}

Close watch is necessary during the repair to prevent the tube from slipping into the right main bronchus or through the fistulous opening if it is large. The technique does not offer any advantage in the rare cases of fistulas opening at the carinal level or in one of the main bronchi. It must be stressed that this technique is not a substitute for preoperative gastrostomy, but an additional precautionary measure. Besides serving as a vent prior to ligation of the fistula^{1,3} and reducing the risk of regurgitation,^{1,2,4} a functioning gastrostomy will help prepare critically ill babies, permit early postoperative feeding, and put the esophagus at rest during healing of the anastomosis.⁴

* Obtainable from National Catheter Corporation, Argyle, New York.

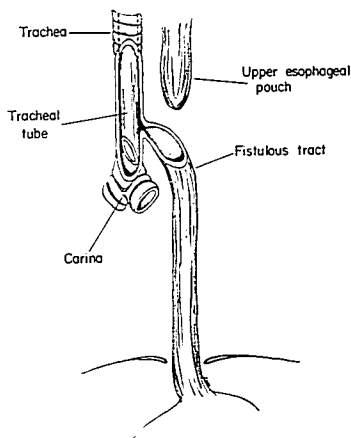


FIG. 1. In a patient with a tracheoesophageal fistula of the commonest type, placement of the tip of the tracheal tube distally blocks the fistulous opening in the trachea and prevents gastric distention during IPPV.

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