Anesthetic Management of Laryngotracheoesophageal Cleft

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Laryngotracheoesophageal cleft is a rare congenital anomaly. The cleft is a posterior midline defect and extends from the larynx for a variable distance down the trachea (fig. 1). Of the 34 previously reported cases, only four had the cleft extending the entire length of the trachea. None of these infants survived more than five days. The history and the presenting symptoms may simulate those of esophageal atresia or tracheoesophageal fistula. In 20 per cent of cases, the two anomalies may exist concomitantly.

The present case of complete laryngotracheoesophageal cleft is reported to present a technique of management and to point out the pitfalls.

REPORT OF A CASE

A Caucasian female infant was admitted to the Long Island Jewish–Hillside Medical Center when she was 2 days old. She was described as being tachypneic at birth, with excessive tracheo-bronchial mucus, and a peculiar "horrific" cry. She had bilateral scattered rales and rhonchi. Whenever feeding attempts were made, she choked and became cyanotic.

Repeated x-ray studies of the lungs showed granular infiltrates and numerous areas of atelectasis, suggestive of aspiration.

In the event that an esophageal stethoscope appears to be the only reasonable method of continuous assessment of cardiac function in a procedure where the surgeon will be dissecting structures in the neck, the anesthesiologist should inform the surgeon that an esophageal stethoscope has been inserted. When a structure is palpated and will be incised, it would then be wise for the surgeon to continue palpation while the anesthesiologist moves the esophageal stethoscope up and down. This should minimize the hazard of inadvertent incision of the esophagus.

REFERENCE


Received from the Department of Anesthesiology, Long Island Jewish–Hillside Medical Center, New Hyde Park, and the State University of New York, School of Medicine, Stony Brook, L.I., Accepted for publication February 22, 1977.

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containing a draining tube and the lower pouch a feeding gastrostomy. At the end of the procedure, the Foley catheter was removed. When the infant awakened, the trachea was extubated and she was sent to the Neonatal Intensive Care Unit in satisfactory condition. She was kept in a head-down, prone position that encouraged gravity drainage of excessive mucus.

Two months later, a second surgical procedure was planned, to separate the esophagus from the trachea and close the defects. Nasotracheal intubation was performed with the patient awake, utilizing a 4-mm clear plastic tube. The same anesthetic agents and circuit were used as in the first procedure. Respirations were assisted and at times controlled, as necessary.

The surgical approach was through an incision in the neck, at the level of the thyroid cartilage. Both recurrent nerves were carefully identified.

The reconstruction involved closure of the posterior wall of the trachea around the endotracheal tube. A number-8 Foley catheter was passed into the stomach and the esophagus was reconstructed around it. A cervical esophagotomy and subsequent cervical esophageal gastrostomy was performed.

On the twentieth postoperative day, an attempt was made to extubate the trachea. The patient was unable to maintain an adequate airway, became cyanotic, and a tracheostomy was performed.

**DISCUSSION**

The nature of the anomaly of the upper airway and the type of surgical procedure intended imposed several anesthetic hazards. Had positive-pressure ventilation been needed at any stage during anesthetic management, it would certainly have encouraged aspiration of gastric contents. The placement of an endotracheal tube would not have assured a safe airway, as the anesthetic gases could still have been forced into the stomach via the cleft, causing aspiration. There was also a distinct danger that the endotracheal tube might inadvertently be slid through the cleft into the esophagus, resulting in airway and ventilatory difficulties. Also, to insure a proper seal around the drainage tube placed in the upper portion of the stomach, it was necessary to irrigate the pouch with saline solution and observe any leaks. This saline solution, mixed with blood and gastric contents, could certainly flood the lungs.

The Foley catheter was used to minimize and possibly to prevent these impending threats. The inflated Foley balloon was a satisfactory seal to the gastroesophageal junction. This was confirmed when, on positive-pressure ventilation, the balloon prevented gas from entering the stomach. The Foley catheter was left open to drain. Besides being a seal and a draining channel, it also assisted in maintaining an anterior position of the endotracheal tube and discouraged its tendency to displace posteriorly.

With regard to the second surgical procedure, a large lateral opening of the cleft would have resulted in complete loss of airway control. Inability to maintain ventilation could have been catastrophic. Moreover, any blood oozing from the surgical field may trickle down the side of the endotracheal tube and be aspirated. In an adult, most of these problems can be overcome by using an endobronchial tube. Use of
similar technique in a 2-months old infant is difficult. To circumvent this problem, a tape was placed around the distal portion of the common trachea and esophagus and a tourniquet was applied over the endotracheal tube. This allowed ventilation during the opening and reconstruction of the trachea and the esophagus. The trachea was mobilized up to the carina from the neck to the end of the laryngotracheoesophageal cleft. The opening of the cleft near the carina was kept small, and, together with a high fresh gas flow rate, permitted adequate controlled ventilation. Slight twisting of the trachea during surgical manipulation completely obstructed airway entry. When that occurred, a different surgical approach was tried until ventilation was adequate.

A case of congenital laryngotracheoesophageal cleft is described. The importance of the Foley balloon at the gastroesophageal junction and the application of the tourniquet around the common tube is stressed with regard to the anesthetic and surgical approaches to management of this type of lesion.

References

Anesthesiology
47:67–69, 1977

Anesthetic Management of Prolonged Q-T Interval Syndrome

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A syndrome characterized by recurrent syncopal episodes, prolonged Q-T interval on the electrocardiogram, and a high incidence of sudden death was first described in 1957. More than 70 cases have now been reported. In the majority of instances the cause of syncope has been documented to be paroxysmal ventricular fibrillation. However, ventricular tachycardia and asystole have also been observed during the syncopal attacks. The episodes are often triggered by anxiety, exercise, or sudden fright, particularly when fatigue is present. Some patients have had an associated high-frequency hearing loss, and there is generally a recognizable familial pattern. The syncopal attacks usually begin in childhood, occasionally in infancy, but the onset may be as late as the third decade of life. The onset is particularly late in patients who have normal hearing. With increasing age, the frequency of syncopal episodes and the chance of sudden death tend to diminish.

The normal Q-T interval varies with the heart rate. All patients who have this syndrome have lengthened Q-T intervals when corrected for rate. Various methods of treatment have been tried, but none has been shown to be of consistent benefit. Ventricular pacing has in one case been helpful, but in another precipitated ventricular fibrillation.

In 1971, Moss and McDonald reported a case of prolonged Q-T interval syndrome refractory to antiarrhythmic therapy. A left stellate ganglion block shortened the Q-T interval. A right stellate block increased the Q-T interval, produced electrical alternans of the T wave, and initiated ventricular irritability. A subsequent left cervicothoracic sympathectomy ameliorated the symptoms. This report describes the pre- and intraoperative management of a patient who had prolonged Q-T interval syndrome and describes the rationale for cervicothoracic sympathectomy and gangliectomy.