

3 per cent of these children are in sudden unexplained coma when first seen by the physician.<sup>3,4</sup> Isopropyl alcohol poisoning has been reported following oral intake and following tepid sponging for fever.<sup>5,6</sup> Its toxicity is twice that of ethanol, although the clinical manifestations are similar.<sup>5</sup>

Gastric aspiration, a simple procedure, is one of the most valuable tests in the assessment of coma. Inspection of the aspirate may permit recognition of pills or capsules, while the odor may disclose the nature of other toxic agents. Chemical analysis of the aspirate is considered more informative than that of blood, urine or feces. Finally, removing part of the poison may significantly decrease the duration of toxicity.<sup>7</sup>

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## Nasopharyngeal Stenosis

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Nasopharyngeal stenosis as a complication of adenotonsillectomy results from fusion of the tonsillar pillars and soft palate to the posterior pharyngeal wall and leads eventually to obliteration of the normal channel between the nasopharynx and oropharynx. While nasopharyngeal stenosis is not common (approximately 300 cases are cited in the literature),<sup>1</sup> the difficulties that may be encountered in the anesthetic management of patients with this disorder during reconstructive surgery require special alertness on the part of the anesthesiologist and surgeon. The histories of two patients treated within the past year at our institution are summarized.

## CASE REPORTS

*Patient 1.* A 5-year-old girl was admitted for evaluation and treatment of nasopharyngeal stenosis. A week after tonsillectomy and adenoidec-

tomy she developed an acute throat infection, which was treated with antibiotics. Her parents noted that she was mouth-breathing and that her speech was becoming increasingly nasal; otherwise she was well. Examination of the pharynx revealed that the posterior and anterior tonsillar pillars were fused to the posterior pharyngeal wall and a mass of scar tissue which included most of the soft palate had formed. An orifice about 5 mm in diameter in the midline between the nasopharynx and oropharynx was the only visible airway (fig. 1). The epiglottis was not distorted.

Plastic reconstruction of the palate was planned. Following premedication with secobarbital, 50 mg, morphine, 4 mg, and atropine, 0.25 mg, anesthesia was induced with open-hose cyclopropane and maintained with halothane, 1 per cent, nitrous oxide, 60 per cent, and the balance oxygen, via assisted mask ventilation. An oropharyngeal airway was inserted prematurely and laryngospasm occurred. Succinylcholine, 40 mg, was administered, and the chest was easily expanded. Several attempts to visualize the larynx were unsuccessful. The stenotic lumen was too small to admit the laryngoscope blade and the anatomy was too distorted to permit traumatic introduction of a tube blindly through the nose. A tracheostomy was performed without difficulty and the child was taken to the recovery room in good condition.

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A week later the definitive procedure was completed with the patient anesthetized with halothane, nitrous oxide and oxygen via a 5-mm wire spiral tube inserted into the tracheostomy opening. A skin graft from the thigh was grafted to the pharyngeal bed after excision of adhesions and scar tissue. Two weeks later the tracheostomy tube was removed. The patient was discharged. The postoperative course to date has been satisfactory.

**Patient 2.** A 7-year-old boy was admitted because of increasing respiratory obstruction evidenced by nasal speech and noisy breathing. Six months prior to this admission the parents had noted a gradual increase in noisy respiration following tonsillectomy and adenoidectomy. Four months after the T & A, respiration had become increasingly difficult, and an emergency tracheostomy had been performed, followed by excision of pharyngeal scar tissue. The tracheostomy was allowed to close and the patient was discharged. Two weeks later the patient was admitted to this hospital for a tracheostomy following recurrence of obstructive symptoms. Although there was no evidence of respiratory distress preoperatively, soon after anesthesia was induced with thiopental the patient's airway became obstructed and it was increasingly difficult to ventilate his lungs. He was paralyzed with succinylcholine, but the larynx could not be visualized. A tracheostomy was performed rapidly and the patient was taken to the recovery room. Postoperatively, bilateral pneumothorax and pneumomediastinum were found and subsequently drained. Surgery for release of adhesions of the oropharynx and hypopharynx with application of a split-thickness graft was performed a week later. Two months after the patient's discharge from the hospital further recurrence of scarring was reported.

#### DISCUSSION

The commonest symptoms of pharyngeal stenosis are difficulty with phonation, mouth-breathing, and impaired hearing following middle-ear infections.<sup>2</sup> Complete occlusion is rare; a small opening near the uvula usually persists. The results of surgical correction have been generally disappointing. Procedures limited to excision of scar tissue usually result in recurrence of the stenosis as raw mucosal edges re-epithelialize.<sup>3</sup> The current surgical approach consists of excising all scar tissue and covering denuded areas with skin grafts. Considering the frequency with which the operation is performed, the incidence of nasopharyngeal stenosis following removal of tonsils and adenoids is very low. It occurs most commonly as a complication of infection

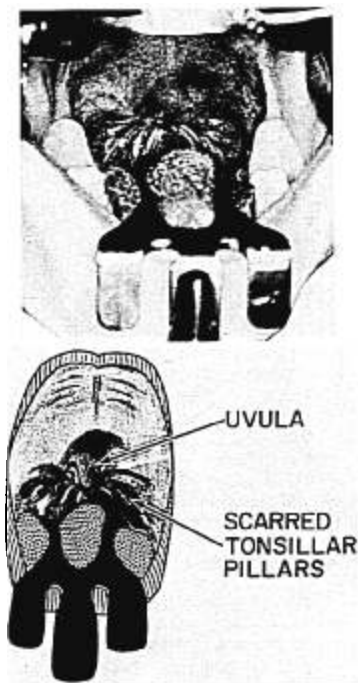


FIG. 1. Photograph and schematic presentation of nasopharyngeal stenosis.

following a technically difficult adenotonsillectomy. In most of the cases cited in the literature the anesthetic management during surgical correction of pharyngeal stenosis is not described, but it is presumed that local anesthesia was used in adults and oral or nasal insufflation in children.

From the experience gained in the cases described in this report we conclude that access to and control of the airway for both anesthetic management and postoperative care of patients with pharyngeal stenosis require tracheostomy. In neither patient could the larynx be visualized or intubated, because of

the stenotic airway. While tracheostomy of adults usually can be performed easily under local anesthesia, it can be a formidable procedure in a struggling child and may result in further complications. Since these children, while asleep, usually have some respiratory difficulty, drugs used for premedication should be administered in low dosages and the patient observed continuously and closely thereafter. Safe induction of general anesthesia demands that the surgical staff be present, alert to the possibility of sudden airway ob-

struction, and prepared to perform immediate tracheostomy.

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### Surgery

**CARCINOID SYNDROME** Any carcinoid tumor greater than one cm in diameter should be treated by a definitive cancer operation. Patients who have carcinoids of the gastrointestinal tract with associated carcinoid syndrome usually have large metastatic deposits in the liver. Signs of the syndrome are flushing, hyperemia and cyanosis of the face and upper portion of the body; diarrhea; asthma; peripheral edema and pulmonic valvular stenosis. Increased amounts of 5-hydroxyindolacetic acid appear in the urine. Drugs for symptomatic relief include heparin, phenoxymethamine, chlorpromazine, and methysergide. Removal of hepatic metastases contributes more to palliation than any other mode of therapy. The most common cause of death is heart failure. (Crowder, B. L., Jr., Judd, E. S., and Dockerty, M. B.: *Gastrointestinal Carcinoids and the Carcinoid Syndrome*, *CA* 18: 212 (July 1968).)

**ABDOMINAL TRAUMA** A study was made of 69 patients with abdominal trauma who entered the operating room in a stable condition but subsequently became decompensated. Tachycardia, changes in body temperature, excessive anesthesia, massive blood replacement, and death due to severe tissue damage were all observed. There appeared to be no specific warnings in the stable patient to indicate the need for special care, equipment or monitoring devices. The history, the location of the wound, and the alertness of the anesthesiologist can lead to proper observation and treatment of the patient. (Henriksen, E. H., and Denson, J. S.: *Anesthetic Management in Abdominal Trauma*, *Surg. Clin. N. Amer.* 48: 1235 (Dec.) 1968.)

**HYPERPYREXIA** Hyperpyrexia developed during anesthesia in six pigs genetically related, but not siblings. Rise in temperature was rapid. Muscles of the limbs were in extreme spasm. Gross metabolic and respiratory acidosis was evident. All pigs were anesthetized with halothane and nitrous oxide. None received succinylcholine. Nearly all cases of malignant hyperpyrexia that have been reported have occurred in patients anesthetized with nitrous oxide and a fluorinated hydrocarbon. Diagnosis of the condition was made early in the last two pigs and anesthesia was discontinued. This did not affect rapid progression of the condition. (Harrison, C. G., and others: *Hyperpyrexia during Anesthesia*, *Brit. Med. J.* 2: 594 (Sept.) 1968.)