An Unusual Complication of Fiberoptic Esophagoscopy

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The advent of the fiberoptic esophagoscope has facilitated diagnostic and therapeutic procedures and decreased the potential risks from the use of rigid instruments. We report a case of acute cardiovascular collapse following fiberoptic esophagoscopy in a patient with a stenosing carcinoma of the lower half of the esophagus.

REPORT OF A CASE

A 90-year-old man weighing 120 pounds was scheduled for esophagoscopy with general anesthesia. Preoperative examination revealed that he was undernourished, with a history of chronic heart failure and atrial fibrillation, chronic obstructive pulmonary disease, generalized osteoarthritis, and roentgenographic evidence of an abrupt severe stenosis of the esophagus 7 cm above the cardia, a short esophagus, and hemoideal of the fundus into the thorax.

On the day of operation, the pulse was 75/min and regular, blood pressure 130/80 mm Hg, hemoglobin 12.5 g/100 ml, hematocrit 39 per cent, blood urea nitrogen 23 mg/100 ml, and creatinine 1.7 mg/100 ml. The electrocardiogram showed sinus rhythm; no active parenchymal disease was evident on roentgenograms of the chest. The patient received no premedication.

Prior to induction of anesthesia the esophagus was suctioned and the lungs preoxygenated. Anesthesia was induced with thiopental sodium, 100 mg, with succinylcholine, 60 mg, being injected to facilitate tracheal intubation. Anesthesia was maintained with N₂O-O₂ 3 L/2 L and d-tubocurarine, 6 mg. The lungs were manually ventilated.

A fiberoptic esophagoscope was smoothly introduced, but the surgeon, being unable to pass by the stricture, intermittently pumped air into the esophagus to facilitate the procedure. Ventilation of the lungs became increasingly difficult. The neck and upper thoracic veins became engorged, the pulse rate increased to 130/min, and the systolic blood pressure decreased from 130 to 100 mm Hg. The surgeon was notified and he attempted in vain to pass a fлиз浪漫 catheter to release the trapped air. Rapid, marked distention of the abdomen followed, and the pulse became imperceptible. External cardiac massage was considered but not instituted because of the risk of rupture of the stomach. Bilateral entry of air in spite of greatly decreased compliance helped in excluding tension pneumothorax clinically. Mephenesin, 30 mg, was given intravenously in two successive doses and the patient's lungs ventilated with 100 per cent oxygen. The systolic blood pressure increased to 130 mm Hg and the pulse rate to 160/min. A rectal tube was inserted and a gush of air led to partial decompression of the abdominal contents. Tachycardia persisted in spite of the normal blood pressure, and the neck veins remained engorged. Digoxin, 0.75 mg, and furosemide, 40 mg, were given intravenously; 10 minutes later, the pulse decreased to 120/min and the systolic blood pressure stabilized at 120 mm Hg. A roentgenogram of the chest confirmed the absence of pneumothorax at that stage. Endoscopy was resumed uneventfully, using 100 per cent oxygen and diazepam for anesthesia. The patient awoke with no sequelae.

DISCUSSION

Regurgitation of stomach content with aspiration into the lungs has occurred during gastroscopies performed under local analgesia.¹-² Rupture of the stomach is a well-known hazard following accidental gastric insufflation.³ In our patient, air was trapped below the stricture, which acted as a one-way valve, and accumulated primarily in the intrathoracic part of the fundus. This led to compression of the lungs and mechanical obstruction to the venous return from the lower half of the body, resulting in the cardiovascular collapse that followed. This would have been prevented had gastric decompression been rapidly performed.⁴ Severe gastrointestinal distention has been observed in anesthetized patients after several hours of nitrous oxide inhalation. This is a slow process, and diffusion is limited by the increased intraluminal pressure.⁵ In our patient, therefore, nitrous oxide probably played only a secondary role. We believe that air insufflation during esophagoscopy should be minimized in the patient with a hiatus hernia unless easy access to the trapped air and rapid decompression of the stomach are readily possible.

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Internal Carotid Artery Stump Pressures during Regional Anesthesia

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In recent years there has been controversy concerning the appropriate anesthetic management of patients undergoing carotid endarterectomy. It has been suggested that general anesthesia is superior to regional techniques.¹,² The effects of hypercarbia versus hypocarbia, induced hypertension, and the effect of general anesthetics on cerebral oxygen consumption (CMRO₂) have been documented³-⁵; however, we are unaware of similar studies conducted in the awake patient under regional anesthesia.

Recent studies have indicated that during clamping of the internal carotid artery, the blood pressure cephalad to the clamp is representative of blood pressure in the proximal parts of the middle and anterior cerebral arteries of the same side.⁶ There is also evidence indicating a linear relationship between internal carotid artery occlusion pressures (stump pressure) and regional cerebral blood flow. Boysen and associates have also reported that a stump pressure below 60 mm Hg increases the risk of cerebrovascular insufficiency during the period of internal carotid artery occlusion during general anesthesia.⁷

The purpose of the present study was to correlate stump pressures during regional anesthesia with clinical signs of cerebrovascular insufficiency in the awake patient. We also measured PaO₂, PaCO₂, and mean systemic blood pressures in an attempt to determine whether adequate oxygenation, ventilation, and blood pressure control could be maintained during regional anesthesia.

MATERIAL AND METHOD

Subjects of the study were 18 patients undergoing carotid endarterectomy under regional anesthesia. Four patients had bilateral staged procedures and were studied on each occasion. Indications for operation were transient ischemic attacks, previous cerebrovascular accident with recurrent transient symptoms, or an abnormal carotid arteriogram obtained prior to undergoing aortoiliac reconstructive surgery. Preoperative arteriograms to rule out a stenotic lesion in the distal intracranial circulation were performed in all patients. The mean age of the patients was 59 years (45-77).

Anesthetic management consisted of a superficial and deep cervical plexus block with 1.5 per cent mepivacaine or 1.5 per cent lidocaine with 1:200,000 epinephrine, using the technique described by Moore.⁸ The block was supplemented by local infiltration

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