A Modified Tongue Blade for Adenotonsillectomy

WILLIAM H. BARBEE, M.D.*

Dr. Barbee believes that for adenotonsillectomy an anode or non-collapsible, endotracheal tube under the blade of a Davis gag provides the safety of an endotracheal catheter as well as an unobstructed field for the surgeon. He finds that surgeons who previously objected to the use of a tube, for various reasons such as laryngeal edema and cord granulomas, now willingly accept the endotracheal technique. However, it is difficult to keep the tube under the tongue, particularly in older children where large caliber tubes are needed.

The slotted blade, described by Doughty,[1] was unobtainable from surgical supply houses and the available tunneled blades were unsatisfactory. The craftsmen in the hospital machine shop slotted the regular tonsil blades, but the tube bulged through the slot and the open pronged end of the blade was potentially a traumatic weapon. Another significant disadvantage was that the surgeon could still see the tube. By roofing over the slotted tongue blade a groove was formed which provided room for the tube, as shown in the accompanying illustration. The blade is easier for the surgeon to handle, the tube moves with the blade from one side of the mouth to the other and there is less chance of the tube hanging up and being inadvertently removed when the surgeon does take out the blade.

Although this modification of the regular blade is a simple and small change, we have been impressed with its acceptance by the surgeons and find that it makes it much easier to convince reluctant surgeons of the advantages of an endotracheal catheter for adenotonsillectomy.

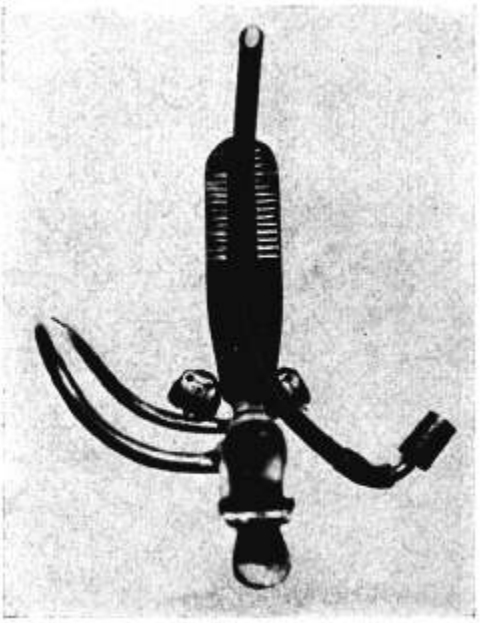

FIGURE 1.

* St. Mary's Hospital, San Francisco.

REFERENCE

1. Doughty, A.: Anesthesia for adenotonsillectomy, a critical review, British J. Anesth. 20: 407, 1957.

CASE REPORT

Massive Pulmonary Embolism

This is the initial presentation of the Committee on Clinical Anesthesia Study Commissions from case reports submitted by members of the American Society of Anesthesiologists. The following case report was selected to illustrate massive pulmonary embolism and to stimulate interest in its management. Such a complication, if unrelieved, is fatal. Present-day cardiac surgery techniques might have enabled the required pulmonary embolectomy.

A young woman sustained a fracture of her left femur in a head-on car collision. At the time of accident she had a brain concussion and lost consciousness for several hours. When

she was brought to a hospital, it was evident that she had multiple fractures including her pelvis and left femur. During the next 4 days, neurological examinations revealed no abnormalities and it was decided to reduce the fractured femur by insertion of an intramedullary rod.

The patient's physical condition was good. She was of average height and weight. Her temperature was 37.6° C. Her pulse rate was 82 per minute and her respiratory rate was 18 per minute. Her arterial blood pressure was 110 mm. of mercury systolic and 80 diastolic. Her lungs were clear and her heart sounds were normal. Hemoglobin was 13.0 g., hematocrit 38 and white blood count 8,950. Urinalysis was negative.

For preanesthetic medication this patient was given 75 mg. of meperidine and 0.4 mg. of scopolamine intramuscularly. Forty-five minutes later she was well sedated, her blood pressure was 110/70 and her pulse rate was 94 per minute. While she was still in bed with her leg in traction, an intravenous infusion of 0.2 per cent thiopental in 5 per cent dextrose in water was started. The patient became somnolent when 75 mg. of thiopental had been administered. Leg traction was discontinued and the patient was moved onto the operating table. Thiopental was stopped and anesthesia continued with 2 per cent halothane and oxygen (3 liters of oxygen per minute flowing through a Fluotec Mark 2 vaporizer) in a semiclosed system. After seven minutes, the halothane concentration was reduced to 1.5 per cent and five minutes later to 1.0 per cent. The patient's blood pressure was maintained at 100/70. The pulse rate diminished to 80 per minute. Respiratory rate was 22 per minute with the expiratory tidal volume (measured by a respirometer) varying between 450 and 500 ml. An intravenous infusion was maintained with 500 ml. of lactated Ringer's solution. The patient's electrocardiogram showed a regular sinus rhythm in lead 1.

Sixty minutes after induction of anesthesia and 25 minutes after start of surgery, while the upper femoral fragment was being reamed, there was sudden respiratory arrest. Immediately, the patient's lungs were inflated with oxygen and artificial respiration by rhythmic manual compression of the breathing bag was maintained. There was no resistance to ventilation but cyanosis was noted to develop and the veins in the neck became more prominent. The electrocardioscope still showed maintenance of a regular sinus rhythm with diminished QRS amplitudes at a rate of 100 per minute. Neither pulse nor blood pressure could be obtained. The surgeon was informed of the situation. The color of the wound was good but the femoral artery could not be palpated. Apnea persisted. Both of the patient's pupils became dilated. Closed-chest cardiac compression was started within one minute after respiratory arrest and artificial respiration through an endotracheal tube was continued. A blood transfusion was started. The electrocardiogram deteriorated. After 10 minutes, the left chest was opened in the fourth intercostal space and manual cardiac compression was started. The heart was dilated but beating weakly. The vessels of the left pulmonary hilum seemed patent (those of the right pulmonary hilum could not be reached). Epinephrine, 0.5 mg. was injected into the left ventricle on two occasions but produced only feeble transient response. Resuscitative attempts were ceased after three hours. The anesthesiologist's impression was massive fat pulmonary embolism.

With the pathologist's report omitted, this case report was sent to each of the seven members of the Committee on Clinical Anesthesia Study Commissions for his or her comments. Each one stated that the most likely cause of death in this case was a massive pulmonary embolism.

An autopsy was performed and the significant findings were as follows: "The right ventricle, including the pulmonary conus and the pulmonary artery are opened *in situ*. There is a non-adherent, greyish-red, dried thrombus, almost completely occluding both main branches of the pulmonary artery and lying astride of the bifurcation. There are no emboli distal to this point and in the smaller branches of the pulmonary artery. The total thrombus measures approximately $5 \times 2 \times 1$ cm."

Comments

The sudden signs manifested by the patient in this case made the attending anesthesiologist think of a massive pulmonary em-

bolus. Every member of the committee to whom this case report was sent concurred with this diagnosis. In the hope that a better knowledge of this complication might occasionally result in the heroic appropriate treatment, it seemed well to review briefly some of the essentials worth knowing.

Some interesting physio-pathological concepts of pulmonary embolism have been described by de Takats in his monograph on vascular surgery.[1] A diagnostic and understandable feature of massive pulmonary embolism is the acute right ventricular hypertrophy and hypertension which results in increased pressure in the superior and inferior vena cava as evidenced by the increased venous distention in the neck. A baro-receptor reflex, similar to that of the carotid sinus reflex, has been described as being induced by increased pressure resulting from embolization in the pulmonary artery.[2] The sudden resulting arterial hypotension may cause sufficient oxygen-lack to produce coronary insufficiency with dilatation and failure of the right heart manifested on the electrocardiogram by deep S and Q_3 wave.

We asked a prominent cardiac surgeon to suggest appropriate surgical treatment of massive pulmonary embolism in the event this complication occurred in a medical center equipped to cope with such an eventuality. He stated that "where there is adequate warning and forty to sixty minutes time available to set up an extra lung by venous take-off, veno-pulmonary by-pass through a disc oxygenator, and return to the femoral artery, pulmonary embolectomy could then be performed." [3] If, as in the case reported, there is neither sufficient time to establish cardio-pulmonary bypass nor the equipment available, an operation known as the Trendelenburg operation has been described and modified [4, 5] so as to attempt pulmonary embolectomy directly. To do this, the heart is exposed swiftly. The anterior wall of the right ventricle is incised longitudinally after placing two parallel sutures in the wall of the ventricle. A #34 catheter is pushed through the cardiac incision into the opening of the pulmonary artery and suction is applied to extract the embolus. According to Harken, the medical literature reveals that this procedure has been tried in 411 cases but that only 9 patients survived.[3]

REFERENCES

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2. Katz, L. N., and Saphir, O.: The nerve plexus between the aorta and the pulmonary artery, Amer. J. Physiol. **104**: 253, 1933.
3. Harken, D. E.: Personal communication.
4. Benichoux, R.: The surgical treatment of massive pulmonary embolism, J. Int. Chir. **11**: 464, 1951.
5. Neuhof, H.: Problems of embolism of the pulmonary artery, Ann. Surg. **142**: 568, 1955.

Participants of the Committee on Clinical Anesthesia Study Commissions:

Betty J. Bamforth, M.D.
Hubert E. Doudna, M.D.
Nicholas M. Greene, M.D.
Joseph P. Hickey, M.D.
Gertie F. Marx, M.D.
C. R. Stephen, M.D.
Charles L. Burstein, M.D., Chairman

CORRESPONDENCE

The Teaching of Anesthesiology

To the Editor—The article "One Method of Teaching Anesthesia to Medical Students" by Drs. Robert H. Smith and Stuart C. Cullen (ANESTHESIOLOGY **24**: 68–71, 1963) prompts me to report the advantages we have found in recording a certain amount of instructional material on magnetic tapes, as previously suggested by Dr. John Pender.[1]

The audio-tape provides the student with a basic amount of information, available for his learning at a time of his choosing. The presen-

[1] Pender, J. W.: ANESTHESIOLOGY **21**: 81, 1960.