

CURRENT COMMENT AND CASE REPORTS

CURRENT COMMENT is a new department in ANESTHESIOLOGY. In it will appear invited professional and scientific correspondence, abbreviated reports of interesting cases, material of interest to anesthesiologists reprinted from varied sources, brief descriptions of apparatus and appliances, technical suggestions, and short citations of experiences with drugs and methods in anesthesiology. Contributions are urgently solicited. Editorial discretion is reserved in selecting and preparing those published. The author's name or initials will appear with all items included.

AN UNUSUAL POSTOPERATIVE COMPLICATION—DECEREBRATE RIGIDITY

A case of decerebrate rigidity is reported in the hope that by noting the chain of events which leads up to this condition a catastrophe can be prevented and discussion may be stimulated and other similar cases may be reported.

REPORT OF A CASE

The patient, a colored male, aged 15, entered the hospital November 4, 1942. He had had chronic sore throat for a period of several weeks and had been troubled with sore throat at intervals for more than three years. Physical examination was negative except for the sore throat. Tonsillectomy was advised.

Operative Record.—Preanesthetic medication, morphine sulfate, grain 1/8 atropine, grain 1/200, was administered thirty minutes before operation, at 9:00 a.m. Ethyl chloride was given by induction, followed by ether by the drop method. Induction was smooth and there was no struggling or excitement. Ether was given by insufflation. Operation was begun at 9:10 a.m.

The tongue was unusually large and was controlled with difficulty. Adenoids and the left tonsil were removed uneventfully. As the right tonsil was being removed, the tongue suddenly seemed to swell, retraction was very difficult and marked obstruction resulted. Respiration was fairly regular but labored. Pupils were moderately constricted. Anesthesia was discontinued. Bleeding was controlled partially by pressure and as the last bleeding vessel was tied the patient stopped breathing. Artificial

respiration was started immediately and carbon dioxide and oxygen given under pressure. Coramine, 1 cc., was given intravenously but the pulse became weaker and in five to seven minutes the heart stopped. No heart sounds could be heard by stethoscope. Adrenalin, 1 cc., was injected into the heart and within one minute the pulse could be felt. The patient took a deep breath and continued to breathe. Approximately ten minutes after the patient stopped breathing he was breathing normally, the pulse rate was 120 and later it slowed to 100. Oxygen inhalation was continued for thirty minutes. The reflexes began to return and the patient left the operating room in fair condition.

External heat was applied. The pulse was 128; blood pressure, 100 mm. systolic and 70 mm. diastolic and respiration, 24. The patient coughed some.

Postoperative Course.—One hour after operation the patient began to moan but did not respond when spoken to. Glucose, 50 cc. of a 50 per cent solution, was given intravenously. Four and one-half hours after operation he began to scream, the eyes rolled back, the hands and arms were drawn in a position of flexion and the head was drawn backward. The right arm became rigid and movements, active or passive, caused him to moan. This attack lasted for about five minutes, when he became quiet except for occasional cough.

Ten hours after operation the temperature was 101 F.; pulse, 142, and respiration, 22. Tonic and clonic spasms occurred every twenty minutes. They were accompanied by loud outcries. Meningeal irri-

tation was suspected and a neurologist was consulted. He reported: "This is a condition of, affection of the fourth lamina of the pyramidal cells, with the clinical picture of decerebration, hyperextension, sucking action and a characteristic cry."

Twelve hours after operation 50 cc. of 50 per cent glucose was given intravenously and an hour later sodium luminal, grains 3, was administered hypodermically.

Fifteen hours after operation the patient had a convulsive attack. These attacks which gradually diminished in intensity lasted three to five minutes and occurred about every hour. Twitching of the legs occurred at intervals. Examination of contents obtained by spinal puncture gave negative results. Temperature was 104 F.; pulse, 130 and respiration, 20.

The second day after operation the temperature was 104 to 105 F.; pulse, 140 to 150 and respiration, 24. Fluids were given intravenously and clysis performed. The patient made an attempt to talk. Sodium luminal grains 3 was given as necessary. Suction was used *pro re nata* for mucus.

On the fourth postoperative day the report on an electrocardiogram was "Sinus tachycardia, left axis deviation. T waves are not normal in lead 4, but in children this frequently is of little significance." The patient's general condition was about the same.

Five days after operation the patient was given a high calorie and vitamin diet by tube. Intravenous administration of fluids continued. The patient's condition was poor; apparently there was no cerebral function. There was no reaction except for occasional groans and movements of the lips. On the tenth day the respiratory rate and rales in the chest increased. Examination of the chest suggested hypostatic pneumonia. He died on the tenth day after operation.

COMMENT

This patient showed typical posture of the limbs found in decorticate man. The position of the arms was distinctive. They lay across the chest, semi-flexed at the elbows, the forearms slightly pronated and the wrists and fingers flexed. When the head was rotated to the right the right arm was extended at the elbow and became

abducted; the left arm became fully flexed, with the hand touching the neck; the right leg was extended and the left leg was flexed.

AUTOPSY REPORT

Macroscopic Examination.—The body had been embalmed. The examination was negative except for the following: Both pleural cavities showed some blood and embalming fluid. A moderate amount of brownish fluid was present in the abdomen. The trachea and bronchi contained considerable frothy, bloody mucus. The cut surfaces of the lungs showed severe edema of all portions of both lungs and severe congestion of lower lobes of each lung. There were no definite areas of consolidation. The spleen was slightly enlarged.

The scalp and calvarium were removed. The sulci were obliterated because of pronounced swelling and flattening of convolutions. The left hemisphere was pale and firm. The right hemisphere showed some softening in the parietal lobe. The aera was hyperemic. The brain was removed and vessels of the base were normal. The middle right cerebral artery showed no evidence of occlusion of any type. No arterial abnormality is noted grossly. Multiple sections through the left cerebral hemisphere demonstrated edema and swelling without localized change. In the parietal lobe of the right cerebral hemisphere there was an aera of softening which on section at times had a translucent yellowish appearance. Nothing in any way suggestive of hemorrhage could be found.

Microscopic Examination.—Evidence of bronchopneumonia was found in the lungs. Tubules of the kidney showed congestion.

Multiple sections from all portions of brain were examined and there was no detectable difference in microscopic appearance between sections from the softened right cerebral hemisphere and from the left cerebral hemisphere. It would therefore appear that the difference in appearance on macroscopic examination between these two aeras was the result of variation in embalming fixation. In all examined sections of the cortex there was uniform and almost complete disruption of cortical substance. The nerve cells were shrunken, darkened, distorted, and no nuclei were

recognizable. Although similar changes were seen in the underlying white matter, the changes were much more severe in the gray matter. The brain tissue was characterized by lack of blood and by lack of any evidence of inflammatory response. Evidence of hemorrhage, embolism, thrombosis or other arterial abnormality was not found. Degenerative change also was pronounced in the gray matter of the basal ganglia. The ganglion cells of various nuclei in the brain stem, pons, and medulla were almost uniformly devoid of nuclei or showed small pyknotic, eccentric nuclei. In the cerebellum recognizable degenerative change was limited particularly to the Purkinje cells.

Sections of spinal cord presented an open, lacy appearance, suggestive of uniform disintegration of the myelin sheaths. There was marked shrinkage and degeneration of the motor cells of the anterior horn.

DISCUSSION

It is difficult to understand why a person who was unconscious or had stopped breathing for no longer than two minutes would undergo such marked cortical atrophy. It is known that persons who are nearly drowned and apparently have stopped breathing for various lengths of time, recover and apparently are none the worse for their experience.

The resulting cortical lesion necessarily depends upon the degree of anoxemia and its duration. The patient may recover completely, may survive for a variable

period of time with residual symptoms, or may die in a few days, as this patient did. One then must regard the cerebral cortex in some individuals to be more susceptible to oxygen-want than in others, or that suboxygenation for a long period, escaping notice because of the normal black color of the skin and difficulty in seeing the color of the blood, may suddenly culminate in an irreversible process and death ensue.

SUMMARY

A case is reported of a simple tonsillectomy and adenoidectomy which resulted in death. Suboxygenation over a period of time set the mechanism of decerebrate rigidity in motion so stealthily that it was not noticed until an irreversible reaction had taken place, which resulted in death.

The results of autopsy as well as neurologic and electrocardiographic reports are included.

REFERENCES

1. Samson, Wright: *Applied Physiology*, ed. 7, New York, Oxford Medical Publications, 1940, p. 88.
2. Glynn, Ernest: *Death from Fulminating Pneumonia After Nitrous Oxide Anesthesia*, *Brit. M. J.* 1: 895-897 (May 29) 1926.
3. Courville, Cyril B.: *Asphyxia as a Consequence of Nitrous Oxide Anesthesia*, *Medicine* 15: 129-242, 1936.

NORRIS E. LENAHAN, M.D.,
Department of Anesthesia,
University Hospital,
Columbus, Ohio.

A DUAL PURPOSE FUNNEL FOR OPENING CANS AND POURING ETHER *

Frequently in the course of operations it is necessary to open a can of ether for use in the anesthetic gas machine. During the actual pouring of ether into the ether bottle, the escape of air from within the bottle is impeded by the ingoing ether and bubbling is produced in the small ether cup or funnel on the bottle. A dual purpose funnel has been devised.

* This funnel has been constructed by the Heidbrink Company under the supervision of Mr. Roy Anderson.

This funnel is made of a heavy metal. The point of the funnel is sharp (fig. 1a) and the neck is beveled onto the wide part of its cup. Running from the tip to near the top of the funnel is an air vent (fig. 1b). The top of the cup is sloping, and when it is held in the palm of the hand, it fits the palm easily. To open a can of ether the sharp point of the funnel is pressed through the solder top of the can of ether and pushed as far into the can as possible. The beveled surface where the neck joins