

3. Carlens, E.; Hanson, H. E., and Nordenström, B.: Temporary Unilateral Occlusion of Pulmonary Artery; New Method of Determining Separate Lung Function, and of Radiologic Examinations, *J. Thoracic Surg.* 22: 527-536 (Nov.) 1951.
4. Macon, E. B., and Bruner, H. D.: Scientific Aspect of Endotracheal Tubes, *Anesthesiology* 11: 313-320 (May) 1950.
5. Macintosh, R. R., and Mushin, W. W.: *Physics for the Anesthetist*, Springfield, Illinois, Charles C Thomas, 1947, Chap. XII.
6. Björk, V. O.; Carlens, E., and Friberg, O.: Endobronchial Anesthesia, *Anesthesiology* 14: 60-72 (Jan.) 1953.

THOMAS N. MACKRELL, M.D.,
 HRANT H. STONE, M.D.,
 PAUL NEMIR, M.D.,
 HERBERT R. HAWTHORNE, M.D.
Graduate Hospital of the University of Pennsylvania, Philadelphia, Pa.

SUBARACHNOID HEMORRHAGE FOLLOWING TRACHEOBRONCHIAL SUCTION AND THE "STIR-UP" REGIMEN: A CASE REPORT

A well-developed, well-nourished, 32 year old man underwent a gastric resection for duodenal ulcer which had previously ruptured and been closed by an operative procedure. The ulcer crater was visible by roentgen examination. The history revealed no significant findings other than those associated with the ulcer. The blood pressure before operation was 134 mm. systolic and 78 mm. diastolic. Subtotal gastric resection with vagotomy was performed under intercostal-celiac plexus block on September 20. Intubation was performed while the patient was awake and after the oral pharynx and larynx were sprayed with a solution of 2 per cent pontocaine® hydrochloride. Following this procedure nitrous oxide-oxygen (1:1) and 450 mg. of a 0.2 per cent solution of pentothal® were employed to keep the patient from reacting to the endotracheal tube or the surgical manipulation, or both. The anesthesia time was four hours, and nothing unusual occurred during administration of the anesthetics. There were no episodes of hypertension before, during, or in the immediate postanesthetic period. During operation the blood pressure remained in the vicinity of 120 mm. systolic and 60 mm. diastolic. The operation was deemed successful and uneventful.

On the afternoon of the first postoperative day, that is, September 21, the temperature rose to 102 F., the pulse increased from 80 to 120, and respirations from 20 to 26. On auscultatory examination partial or

total collapse of the lower left lobe of the lung was thought to be present. A roentgenogram of the chest showed multiple areas of increased density in line with the left cardiac shadow and extending laterally. The roentgenologist concluded that this appearance might be attributable to "parenchymal involvement" or "multiple areas of atelectasia." He also noted that there was partial collapse of the left lower lobe, as suspected on physical examination. The Anesthesia Department was notified and a bilateral intercostal block from the sixth through the twelfth thoracic segment was performed, using a 0.15 per cent solution of pontocaine which contained 0.2 cc. of epinephrine in a concentration of 1:1,000. One half hour was allowed to elapse so that anesthesia might become established. After this period of time the patient was completely free from abdominal pain, and a tracheobronchial toilet was performed using a number 16 French urethral catheter. The patient coughed vigorously and an estimated 20 cc. of secretion was obtained. The intercostal block was effective for approximately three and a half hours, and five hours after the block the patient voluntarily stated that he felt much better. On physical examination at that time, no signs of a collapsed lung were found, and it was thought that the lower lobe of the left lung was aerated.

On September 22, the second postoperative day, the temperature was 100.5 F., pulse was 96 and respirations were 20. The

interns and residents instituted an active "stir-up" regimen which included having the patient sit on the edge of the bed, encouraging him to cough and concomitantly pounding the thoracic cage as he coughed. The patient was not ambulatory. The radiologist reported on September 23 that there was no "frank collapse" or "consolidation." On the same day (September 23), however, the patient complained of an increased amount of abdominal pain and a severe headache. Because of the fact that he was highly nervous, little attention was paid to the latter complaint.

On September 24, the patient still complained of bitemporal and basal headache and said that his neck felt stiff. Codeine and aspirin gave no relief. Later, during the afternoon of September 25, he began to complain of pain in the low back region and in the back of the leg muscles. Poliomyelitis was considered.

On September 26, neurological consultation was requested and a spinal tap performed. The initial pressure was found to be 330 mm. of water. Right and left jugular compression caused the pressure to rise to 420 mm. and to 440 mm. of water, respectively. Following release of pressure on the jugular veins, the pressure fell to 400 mm. of water. The fluid was homogeneously and grossly bloody in the three test tube samples taken. On completion of these tests, the pressure had fallen to 160 mm. of water. Medications to date had consisted of administration of crystalline, vitamins intravenously and sedatives. No anticoagulants had been administered at any time. That afternoon, the patient complained bitterly of a headache which was pounding in nature, stiff neck, and pain in the back. His temperature rose to 101 F., pulse remained at 84, but respirations increased to 30. On neurological examination, the patellar reflexes were hyperactive, and the Babinski reflex was negative on the left and questionable on the right. The cremasteric reflexes were normal. There was definite nuchal rigidity and the other signs of meningeal irritation, that is, headache, restlessness, nausea and so forth, were present. A slight degree of opisthotonos was noted.

On September 27, the patient exhibited marked opisthotonos. A spinal tap was repeated and the spinal fluid again was

grossly and homogeneously bloody. The pressure was found to be 360 mm. of water initially. After removing 6 to 10 cc. of spinal fluid the pressure dropped to 150 mm. The neurologist commented that there appeared to be no block in the spinal canal, and there were no definite localizing signs which might indicate the exact site of the subarachnoid bleeding.

The spinal fluid obtained from the first tap revealed gross blood, but the bacterial count, culture and smear were negative. At no time during the postoperative period did the patient have a demonstrable episode of hypertension. The blood pressure postoperatively varied between 160 and 90 mm. systolic and 90 and 40 mm. diastolic. The patient's condition remained approximately the same during the day of September 28, but started to improve on September 29. The opisthotonos and rigidity slowly decreased; on October 5 the patient was allowed out of bed and from that date onward he was ambulatory. He was discharged from the hospital October 12, with no complaints or residual symptoms. The back and leg pain, headache, and all other signs of meningeal irritation had disappeared. He was seen approximately one week after discharge, and appeared to be well. One week later he returned to Alaska and further accurate follow-up study was not possible.

In analyzing the probable causes for the subarachnoid hemorrhage, a congenital aneurysm or weakening of a subarachnoid blood vessel which spontaneously and coincidentally ruptured must be considered. It is possible, however, that the severe episodes of coughing and straining which accompany any successful tracheobronchial toilet and "stir-up" regimen could have been responsible for the rupture of this vessel. Inasmuch as forty-eight hours elapsed from the time the tracheobronchial aspiration and the "stir-up" regimen were instituted until the signs and symptoms of meningeal irritation occurred, it is likely that the bleeding vessel was small or that the subarachnoid hemorrhage was unrelated to these procedures. To date, we have not been able to find a report of a similar case in the literature, and we believe that although such instances must be rare, the possibility of subarachnoid hemor-

rhage due to severe coughing from tracheal aspiration or the "stir-up" regimen, or both, is not impossible. This case in no way has altered our indications for intercostal block, tracheobronchial suction and the "stir-up" regimen.

DANIEL C. MOORE, M.D.,
*Director of Anesthesia,
Virginia Mason Hospital, and
Anesthesiologist,
The Mason Clinic,
Seattle, Washington*

A RECORD HOLDER FOR THE LEFT HANDED ANESTHESIOLOGIST

A problem continually confronting the left handed anesthesiologist is to find stable, convenient support for the anesthesia record while recording data. The record holder * shown in the photograph offers a solution to this problem. The holder incorporates a table rail clamp of standard design, affording ready and rigid support. The writing surface is stainless steel, 1/32 inch thick, measuring 10 inches by 14 inches for ample writing surface. A spring paper

* The author is indebted to the Ohio Chemical and Surgical Equipment Company for construction of this record holder.

holder is riveted securely to the writing surface. The latter is strengthened by a bracket measuring 1/4 inch by 1 inch which extends from the table rail clamp for the entire length of the writing surface.

With minor modifications, this device could be constructed for application on either side of the table to be used by right or left handed persons.

WILLIAM H. L. DORNETTE, M.D.,
*Department of Anesthesiology,
University of Wisconsin Hospitals,
Madison, Wisconsin*



FIG. 1.

ASPIRATION OF FOREIGN BODY DURING ANESTHESIA

A 5 year old boy was admitted to surgery for routine tonsillectomy and adenoidectomy; his medical history and physical examination were satisfactory. Atropine (0.45 mg.) was administered intramuscularly one-half hour before operation. Cy-

clopropane was used for induction, followed by open drop ether. The induction and maintenance of anesthesia were uneventful.

For tonsillectomies in children a mouth hook is ordinarily used for ether insufflation. However, in this case ether was insufflated