Medical Memoranda

Fatal Aortic-Oesophageal Fistula from a Swallowed Piece of Bone

The following case of aortic-oesophageal fistula arising from perforation of the oesophagus and aorta by a piece of bone may be of interest owing to the rarity of the condition.

CASE HISTORY

A young Somali adult was admitted to a casualty clearing station for treatment of a small tropical ulcer. The ulcer was given local treatment; the patient had no other complaints. At about 5 p.m. on Oct. 7 he had a normal meal of meat and vegetables. At midnight he complained of nausea and a slight deep-substernal discomfort, and a short time later brought up about a cupful of blood-stained vomit. At about 5 a.m. the next day he suddenly vomited 5 oz. (140 c.cm.) of bright-red blood containing several clots, in which was found a flat piece of bone. Apart from a slight rise in pulse his general condition was good and there seemed no cause for alarm. The piece of vomited bone had the appearance of a cortical portion of some long bone. It was flat and polygonal in shape, and measured 3 cm. in its greatest length and 1.5 cm. in its greatest breadth. The edges and corners were sharp, and one of the long edges was serrated like a saw. A diagnosis of laceration of the oesophagus was made.

Treatment and Progress.—Morphine 1/3 gr. (22 mg.) was given and other first-aid measures for haemorrhage were begun. His general condition improved rapidly; but a blood count at 9 a.m., showed haemoglobin 40% (Sahli) and 1,830,000 red blood corpuscles per c.mm. No oesophagoscope was available. At 12 noon he suddenly vomited about 20 oz. (560 c.cm.) of bright-red blood; much of it was clotted. He was collapsed, with all the signs and symptoms of severe haemorrhage. First-aid shock treatment was given and an intravenous drip of 500 c.cm. of serum was started, followed by 1,000 c.cm. of glucose-saline and later 500 c.cm. of matched blood. His general condition improved somewhat. In the hope of being able to plug the oesophagus from the stomach a laparotomy was performed. The stomach was found to be full of blood clot. There was no lesion of the stomach. A stream of blood was seen pouring from the oesophageal opening. No lesion of the oesophagus could be felt digitally. Closure was performed, and the patient died.

Post-mortem Examination.—The body was that of a well-built, well-nourished male, and, apart from marked pallor of the mucous membranes and a small ulcer on the right shin, there was no evidence of external disease or injury. The pharynx showed no abnormality. On opening the oesophagus it was found to contain a large quantity of blood. On the antero-lateral wall on the left side, 9.5 cm. from the commencement of the oesophagus, there was an area 2 cm. long by 1.5 cm. broad which suggested that a cut had been made by a blunt knife. The mucosa was cut fairly cleanly over this area, but the muscle layers had a slightly shaggy appearance. On passing a probe into the centre of the cut it was found to emerge in the arch of the aorta 1 cm. below the origin of the left subclavian artery. The opening into the aorta was a small irregularly shaped hole about 1 mm. long, and had some blood clot lying at its edges. There was also a cut in the posterior wall of the oesophagus about 9 cm. from the origin of that organ. This cut area was 2 cm. long by 1 cm. broad. Again the muscle coat had been severed, but the wall was not perforated.

No other abnormality of the oesophagus was found. The remainder of the alimentary system showed no abnormality; and no pathological changes apart from the perforation of the aorta could be discovered in the heart or great vessels or any other organs.

The literature of the subject has been reviewed by Bank, R. S., *J. Amer. med. Ass.*, 1943, 122, 1011.

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Dr. Willard C. Rappleye, president of the Josiah Macy Jr. Foundation, New York, announces that more than five million copies of over four hundred leading medical and scientific articles have been published by the Foundation's war reprint service during the last three years for medical officers of the armed Forces of the United States and so far as possible Canada, England, New Zealand, Australia, the U.S.S.R., and China. The reprint service is now discontinued. It has been an effort to bring new and important developments in the science and practice of medicine to medical officers who were largely cut off from the sources of medical information during the war. In the choice of these articles the Foundation has had the active co-operation of the Committee on Pathology of the National Research Council and of the National Committee for Mental Hygiene.

Reviews

MOVEMENT OF EXTRAVASCULAR FLUID IN THE LUNGS

Pulmonary Edema and Inflammation. An Analysis of Processes Involved in the Formation and Removal of Pulmonary Transudates and Exudates. By Cecil K. Drinker, M.D., D.Sc. Harvard University Monograph in Medicine and Public Health. No. 7. (Pp. 106; illustrated. \$2.50 or 14s.). Massachusetts: Harvard University Press; London: Oxford University Press. 1945.

An outcome of recent work, employing isotopes, on the distribution of ions throughout the body and of estimations of the volumes of the fluid compartments of the organism by a variety of methods has been the appreciation of the rapidity with which transport and distribution of substances is effected across the various membrane barriers.

In this short monograph, which contains the substance of the Nathalie Gray Bernard lectures, Prof. Drinker deals with the movement of extravascular fluid in the lungs. He regards the formation and circulation of lymph in the lungs, and the production and removal of alveolar transudates and pleural effusions, as parts of one large problem. The factors affecting fluid exchange, while similar to those operating in other tissues, are modified by the mechanical conditions under which the lungs work. The minute anatomy of the lungs is first reviewed, and then follows a description of the experimental methods by which the lymph from the lungs can be collected. The salient differences, often disregarded, between the systemic and the pulmonary capillaries are examined particularly with reference to the pressure relationships of the blood vessels, air passages, and lung tissue. The factors which may disturb the normal balance between the rate of tissue fluid formation and lymph drainage are discussed and, by reference to his own experimental work, the influence of anoxia on capillary permeability is stressed. From observations, both clinical and experimental, it is concluded that limitation of lung movement, slight respiratory obstruction, or anoxia produced in any way, may give rise to a degree of pulmonary oedema which, while insufficient to be revealed by ordinary clinical examination, may encroach upon the pulmonary reserve, prevent the free exchange of pulmonary gases, and provide conditions suitable for the spread of infectious inflammation. In a concluding chapter present methods of artificial respiration are reviewed, not only for their effect on ventilation but also for the changes likely to be produced in the lungs by the particular method employed.

Although the problems raised are not new and the consideration given to them is necessarily rather superficial, yet the approach to them is stimulating, as may be anticipated when the way is by the author's own investigations, and the majority of them are of fundamental importance to the physician, the anaesthetist, and the thoracic surgeon.

HISTORY OF SCIENCE

Science Past and Present. By F. Sherwood Taylor, Ph.D. (Pp. 270; illustrated. 10s. 6d.) London: Heinemann. 1945.

Dr. Sherwood Taylor has had the excellent idea of putting together a history of science which is also a "source book." Each of his eighteen chapters—beginning with man's first efforts to make flints, and ending (inevitably) with the atomic bomb—is followed by a series of quotations from contemporary writers which, in their cinematographic effect, give a livelier impression of the knowledge and outlook of successive generations of inquirers than can be obtained from much more ambitious histories. His chapter on "The Revival of Observation"—the sixteenth century—provides a good illustration of the method. The main text compresses into a matter of eight pages a general sketch of the Renaissance and a sufficient survey of the science of the period to establish the point that astronomy and anatomy were the only branches in which outstanding advance was being made. Then we come to the quotations: Copernicus's explanation of how he "began to think about the mobility of the earth"; Vesalius's demonstration in a sow of "the connexion of the voice with the recurrent nerves" ("This animal is chosen because it can be relied on to squeal continuously and so provide the voice which is the subject of the experiment"); a typical prescription, from Fumanelli,