NEW APPLIANCES

Set of Pulmonary Embolectomy Trumpet Sucker Ends

Dr. Z. A. PISKO-DUBIENSKI, first assistant, department of thoracic surgery, the London Hospital, writes: In the course of a recent pulmonary embolectomy without cardio-pulmonary bypass it was felt that a complete clearance of the left pulmonary arterial tree was not achieved. As judged by the pulmonary angiogram, the patient had the most extensive pulmonary embolus in our series (Fig. 1). Pulmonary embolectomy in this case could have been performed within half an hour of onset of symptoms. Unfortunately his electrocardiogram suggested myocardial infarction as well as showing severe right ventricular strain pattern. In these circumstances it is our policy to have a confirmatory pulmonary angiogram. With the greatest possible haste this causes a delay of some 40 minutes. After embolectomy the left ventricle failed to maintain an adequate systemic arterial pressure in spite of vigorous supportive measures. The patient died, and at necropsy further emboli were

found in the left lower lobe arteries (Fig. 2). There were, in addition, occlusion of the anterior descending branch of the left coronary artery and a large mural thrombus in the left ventricle (Fig. 3).

The presence of further emboli in the pulmonary artery branches prompted me to design sucker ends which would remove emboli effectively—not only from the right and left pulmonary arteries, but also from their branches. A series of trumpet sucker ends of varying sizes were accordingly made (Fig. 4).

Trumpet Sucker Ends and Stand.—The whole is made of brass and is silver or nickel electroplated. The ends are trumpet-shaped and have a softly rounded shoulder to present a non-traumatic edge to the arterial wall. Their largest outside diameters are 21, 18, 14, 11, and 9 mm. Their height varies with their size. They are mounted on two double-bend metal suckers with two independent sucker units and are used in succession.

Use of Trumpet Suckers During Embolectomy.—The two largest trumpet ends are screwed in position and are held in readiness at the beginning of the actual embolectomy. A transverse sinus clamp is applied across the pulmonary trunk and the aorta and a vertical 2.5-cm. arteriotomy between two stay sutures is made in the pulmonary trunk. The largest sucker is introduced and advanced into the left pulmonary artery while the stay sutures are crossed to give an airtight fit. The sucker will engage clot almost immediately and should be rapidly delivered through the arteriotomy, which is now held open by the stay sutures. Successive sizes of suckers are used, first in the left arterial tree (it is easier to explore) and then in the right. While one sucker is in use the next trumpet end is mounted and held in readiness. The procedure requires practice, maximum utilization of time, and precise allotment of tasks. The total flow occlusion should not be more than 100 to 120 seconds.

FIG. 1

FIG. 1.—Pulmonary angiogram showing over 90% occlusion of the pulmonary circulation. Arterial phase of angiogram shows perfusion of part of left lower lobe and minimal flow in the right upper and middle zones. In addition the right dome of the diaphragm is raised.

FIG. 2

FIG. 2.—Necropsy dissection of pulmonary arterial tree. Emboli seen occupying left lower lobe branch and segmental artery. The remaining arteries were cleared of clot at embolectomy.

FIG. 3

FIG. 3.—Oblique section through left ventricle shows well-organized mural thrombus. To the left a specimen containing occluded part of anterior descending branch of left coronary artery. Inside fresh, still red thrombus was found.

FIG. 4

FIG. 4.—Set of pulmonary embolectomy trumpet sucker ends and mount. The whole is made of brass and is electroplated. The gentle flare ends in a rounded edge to avoid damaging pulmonary artery walls. Widest outside diameter is 21 mm. and is designed to remain in pulmonary arteries. The next in size is 18 mm. and is meant for lower lobe and right upper lobe arteries. The remainder are 14, 11, and 9 mm. wide respectively and will enter progressively smaller branches. The 3-mm. wide edge shoulders the embolus firmly during delivery and prevents its disimpaction from mouth of sucker.