

CURRENT COMMENT AND CASE REPORTS

CURRENT COMMENT is a section in ANESTHESIOLOGY in which will appear invited and unsolicited 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.

A CONNECTOR FOR ENDOBRONCHIAL ANESTHESIA

Carlens' endobronchial tube, originally designed for use in bronchspirometry (1), has been very useful to us for anesthesia in selected cases of pulmonary resections. It has been life-saving in at least one case in which a massive hemorrhage occurred into the right main stem bronchus. Anesthesia was maintained by administration of ether into the patient's left lung while suction was applied constantly to the trachea and right lung.

Carlens, Björk and Friberg (2) did not describe their apparatus in detail. We experienced considerable difficulties in connecting the tube to the anesthesia machine. The diameter of the large size tube is 7 mm. which obviously creates some degree of obstruction. No connector, therefore, can measure less than 7 mm. in diameter at any one point. We were fortunate to have Mr. William Morris from the Engineering Division of the Veterans Hospital in Butler, Pennsylvania (Engineer Officer: Mr. G. Stinedurf) make a connector to our specifications.

The enclosed picture is self-explanatory. 'C' is a universal adapter that fits any standard chimney Y. The tubes 'B' separate the air flow and direct it toward the connecting tubes 'D' which are soldered close enough to insure proper fit with the Carlens tube. The stopcocks in 'B' can shut off the air flow separately to either side.

The tubes 'A' with stopcock allow room air to enter into either lung, primarily for the introduction of the suction catheter. Long ureteral catheters will pass adapter and tube for this purpose.

With the adapter not only can the air streams to both lungs be completely sepa-

rated but also suction or positive pressure can be applied to each lung individually.

We do not know what effect the use of the Carlens tube will have upon cardiopulmonary function or upon the air turbu-

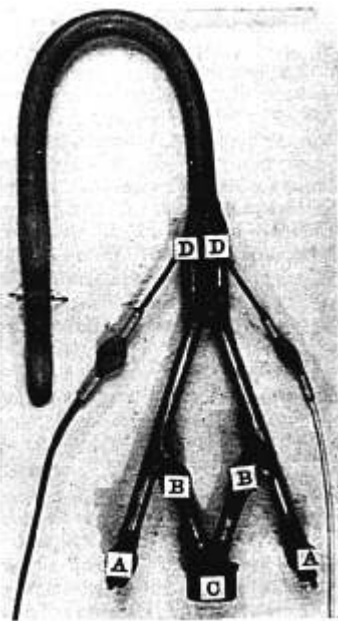


FIG. 1.

lence. Until such time as these problems are solved, the use of the tubes should be limited to such cases as resections in which excessive secretions or intrabronchial hemorrhages are anticipated.

REFERENCES

1. Carlens, Eric: New Flexible Double-lumen Catheter for Bronchspirometry, *J.*

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2. Björk, Viking O.; Carlens, Eric, and Friberg, Olle: Endobronchial Anesthesia, *Anesthesiology* 14: 60-72 (Jan.) 1953.

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AN INEXPENSIVE "HOMEMADE" VALVE FOR NONREBREATHING TECHNIQUE OF PEDIATRIC ANESTHESIA

With the advent and increased use of endotracheal anesthesia the nonrebreathing technique in pediatric anesthesia has come into extensive use. The Leigh (1) valve and the Stephen-Slater (2, 3) valves have answered the need for the vital part of this apparatus. However, both of these valves are difficult to obtain at times and are relatively expensive. For these reasons I have designed a valve which can be made with little difficulty and at very little expense. For the person with little mechanical ability, the metal part of the valve can be made quickly by any competent machinist or plumber.

The original models were made of stainless steel, by far the most satisfactory material because of its toughness, resistance to wear and corrosion, and its relatively light weight. However, the tube portion of the valve may be made of almost any metal or plastic. The tube is cut to a length of 3 inches with an inside diameter of 19/32 inch. One end may be reamed slightly to 39/64 inch on the inside to take the standard Magill curved slip joint endotracheal catheter connection. One inch from this end a hole 3/8 inch in diameter is drilled into the tube. This piece of tubing constitutes the permanent part of the valve.

A piece of 3/8 inch rubber Penrose tubing 2 1/2 inches long for the inspiratory valve and a piece of 5/8 inch rubber Penrose 2 1/2 inches long for the expiratory valve constitute the remainder of the valve. One end of the 3/8 inch rubber tubing is cut along each folded edge about 5/8 inch and the proximal 1/8 inch of the cut ends are cemented together to produce a close approximation of the ends. One end of

the 5/8 inch rubber tubing is cut along each folded edge about 1/2 inch and preferably with a 1/8 inch bevel. The proximal 1/8 inch of the cut ends are cemented together on each side like the 3/8 inch tubing. The opposite end of the 5/8 inch rubber tubing is cut along the folded edges about 1 1/4 inch. The valve is then assembled as shown in the illustration.

The 5/8 inch rubber tubing is secured around the metal tube with rubber cement or tape, or both, care being taken to place the valve directly over the hole in the metal tubing. The 3/8 inch tubing is inserted into the opposite end of the metal tube and a cuff 1/2 inch long is folded over the metal tube as illustrated. If the tubing is inserted too far into the metal tube it will occlude the expiratory hole. The rubber portions of the valve are easily and quickly replaced as necessary.

The valve works on somewhat the same principle as the Leigh and Stephen-Slater valves. There is negligible accumulation of carbon dioxide and respiratory resistance is minimal. Gases flow from the reservoir bag into the metal tube by inspiratory effort unless gas flow and bag content are excessive. In either event exhaled gases do not pass back into the reservoir bag. From the metal tube gases pass by way of the endotracheal catheter to the patient. Resistance is minimal at high flow, depending on how carefully the rubber parts are made. With a slower rate of gas flow as for smaller children the resistance to expiration is less. The dead space in the valve is 9 to 10 cc, that of the mouth and pharynx being reduced by the endotracheal catheter.

As recommended by Stephen and Slater