Clinical Workshop

S. G. HERSHEY, M.D., *Editor*

A Method for Heat-forming Tapered-tip Teflon Catheters

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Placement of catheters for direct measurement of arterial pressure is a standard clinical and research procedure.[1] Catheters made of Teflon, a brand of TFE fluorocarbon resin, are generally used for this procedure. In our clinics we use an 18-gauge thin-walled Cournand needle[a] for arterial puncture, with a 0.036" o.d. flexible stainless steel guide wire[b] passed into the artery through the needle prior to insertion of a Teflon catheter.

Insertion of the Teflon catheter into the vessel is facilitated if the last 3- to 5-mm portion of the catheter is uniformly tapered. The longest tapered Teflon catheter currently available commercially—the Long-dwell catheter placement unit[c]—is only 8 inches in length. Recording of subclavian artery pressure requires a catheter approximately 12 to 14 inches in length advanced from the brachial artery at the antecubital fossa. Until recently, we have shaved the catheter tip carefully to obtain the desired taper. This procedure, however, is unreliable and time-consuming; in many cases wall thickness at the tip is not uniform, and the exterior of the catheter tip lacks the desired smoothness so necessary for atraumatic insertion. We therefore modified the method for producing tapered polyethylene catheters,[2] to provide for heat-forming of uniformly-tapered Teflon catheters. It is simple, efficient, and produces uniform wall thickness with preservation of a smooth exterior catheter finish.

Methods and Materials

A Teflon catheter[d] of suitable length is selected. Approximately 4 inches of its length is threaded over an 8-inch length of 19-gauge wire (0.0425" o.d.).[e] The catheter is held firmly on the wire (fig. 1) while the midportion is heated uniformly by rotation over a low flame, care being exerted to heat the catheter throughout its entire circumference. The proper degree of plasticity is indicated by clearing of the catheter and a slight uniform swelling. The longer portion of the catheter is then pulled, drawing the heated portion down to the external diameter of the 19-gauge wire,

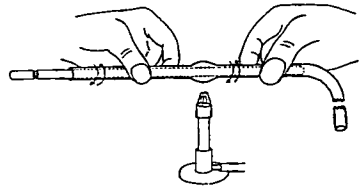

FIG. 1. Uniform heating of Teflon catheter by rotation over low Bunsen flame. Proper degree of plasticity indicated by clearing and slight uniform swelling of catheter.

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Received from the University of Washington, Schools of Medicine and Dentistry, Seattle, Washington. Supported in part by U. S. Army Research and Development Command, Office of the Surgeon General, Contract DA-49-193-MD-2231 and in part by N.I.D.R. Grant DEO 2419-04.

and forming a uniform wall thickness with a smooth external surface (fig. 2). The catheter is then trimmed with a scalpel to the desired length of taper, slipped off the wire stylet, remeasured, and any excess length removed from the untapered end.

We believe catheters formed by this method are superior to those produced by the previously-mentioned shaving method. They are easily sterilized and with careful handling will withstand repeated usage.

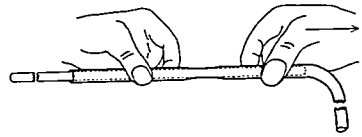

FIG. 2. Catheter removed from heat, the proximal end fixed firmly to the inserted stylet, and tension applied to the distal portion. The heated portion of the catheter is drawn to the o.d. of the stylet and a uniform taper is produced.

REFERENCES

1. Seldinger, S. I.: Catheter replacement of the needle in percutaneous arteriography, Acta Radiol. 39: 368, 1953.
2. Amplatz, K.: Percutaneous arterial catheterization and its application, Amer. J. Roentgen. 87: 268, 1962.

PRODUCT DESCRIPTION

a. 18-gauge thin-wall Cournand needle—(T 488LNR) B-D #1269. Becton, Dickinson and Company, Rutherford, New Jersey.

b. Stainless steel flexible guide wire, 0.036" o.d. —(01-0013) B-D #1538. Becton, Dickinson and Company, Rutherford, New Jersey.

c. 18-gauge Long-dwell catheter placement unit —(01-0050) B-D #6723. Becton, Dickinson and Company, Rutherford, New Jersey.

d. Teflon catheter 0.042" i.d.—(TTX-042) B-D #6437. Becton, Dickinson and Company, Rutherford, New Jersey.

e. 19-gauge wire 0.0425" o.d.—stylet from a 16-gauge Long-dwell catheter placement unit, B-D #6735, is suitable.

Fail-safe Apneic Control in the Bird Ventilator

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Inability to trigger a Bird ventilator and thereby initiate inspiration by a patient whose life is supported by continuous mechanical ventilation, should not be permitted to result in profound changes, either in oxygenation or in ventilation. The Bird ventilator, which is basically a pressure-cycled machine, is provided with a time-cycling mechanism, the expiratory timing cartridge, or "apnea" control. Pressurized during inspiration, the expiratory phase depends on the rate of "gas leak" through a porthole in the expiratory cartridge. Closure of this porthole results in an expiratory phase of infinity. Safe practice dictates that the expiratory time control be set to provide a respiratory frequency slower than the spontaneous frequency of the patient. In the event of a sudden decrease in the patient's respiratory frequency, inspiration will be initiated automatically by the ventilator. In spite of education of physicians, inhalation therapists and nursing staff, closed expiratory timing cartridge controls are found all too often, representing an unnecessary threat to innumerable patients. We have, by a single modification of the ventilator, circumvented, and thus prevented, this possibility. The manufacturer supports the modification proposed.[1]

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MATERIALS AND METHODS

The apnea control is adjusted to provide a minimum respiratory frequency of 6 to 8/min. A 3/32" Allen wrench is used to loosen the Allen screw, permitting the apnea control knob to