

LXIII.

SOME ORIGINAL METHODS OF TREATMENT OF LARYNGEAL STENOSIS.

BY SAMUEL IGLAUER, B. S., M. D., CAPTAIN, M. C.,

CINCINNATI.

In this paper it is my purpose to describe some methods of treatment which I have employed to advantage in cases of chronic laryngeal stenosis. These methods are only applicable with patients wearing a tracheal canula, or in cases in which it was deemed best to perform a tracheotomy as part of the treatment. In addition there must be a real or a potential passage through the larynx to the tracheal fistula.

1. Dilatation by Means of a Rubber Tube Doubled Upon Itself.—This procedure is based upon the well known effect of the continuous elastic pressure of rubber tubing in promoting the resorption of cicatricial tissue. It follows the same principle which underlies the use of rubber tubes in laryngotomy, but has the advantage of being employed without the necessity of splitting the larynx.

The technic is as follows: A stout silk cord (A, Figure 1), about eight inches long, is firmly tied about the center of a piece of soft rubber tubing (B) of a diameter to suit the case. The tubing is then doubled upon itself and the free ends are firmly tied together with a second cord (C). The length of the tube, when doubled, should approximate as nearly as possible, the distance from the arytenoids to the upper margin of the tracheotomy. The spring wire taken from a Bellocq canula (or some similar appliance, such as a grooved director perforated at the tip) is threaded with a cord in the usual manner. The tracheal canula having been removed, the wire is introduced through the tracheotomy opening until it presents in the mouth (mouth gag), when the cord it carries is pulled out of the mouth. The wire is then withdrawn from below, leaving the lower end of the cord protruding from the

neck. In old tracheotomies, if any difficulty is encountered in passing the wire toward the mouth, it is best to incise the upper margin of the tracheal opening under local anesthesia.

The oral end of the cord is now tied to the free end of the string (A), and traction is then made downward upon the tracheal end of the cord, drawing the rubber tube into the larynx until its folded end presents at the upper margin of the tracheal fistula (Figure 2). At the same time counter traction is made upon the string (C) to prevent the tube from being drawn too far into the trachea. The tracheal canula is now reintroduced and the string protruding from the trachea is wrapped (clockwise) about the stem of the canula and is then fastened to the patient's neck with adhesive plaster. This is important, since it prevents the rubber tube from gliding past the tracheal canula. The string (C) is allowed to protrude from the patient's mouth (and fastened to the cheek with adhesive plaster), to serve as an extractor when the tubing is to be changed. Otherwise the tubing may be removed by depressing the patient's tongue and seizing the tubing with a forceps. Figure 1B shows the doubled tube in place in the larynx. Should the tube project too far into the larynx it may be cut off by depressing the tongue and seizing the projecting ends with a tonsil forceps, over which a snugly fitting tonsil snare is passed, and amputating the protruding ends of the tubing in situ.

In addition to the elasticity of the rubber itself, the tubing contains imprisoned air, which exerts pneumatic pressure as well. The tubing should be changed after several days, and larger tubing can be substituted. In making the change it is usually unnecessary to employ the Bellocq canula a second time, because during extraction the tubing draws the long string (A) after it, and this string can then be attached to the next size rubber tube, which is then drawn into place as before.

This procedure has been employed to considerable advantage in the course of treatment of some five patients. In one case with a complete subglottic cicatricial diaphragm, a passage was first made by blunt dissection, with the patient in suspension. Through this passage a single piece of rubber tubing was first drawn and allowed to remain. In a short

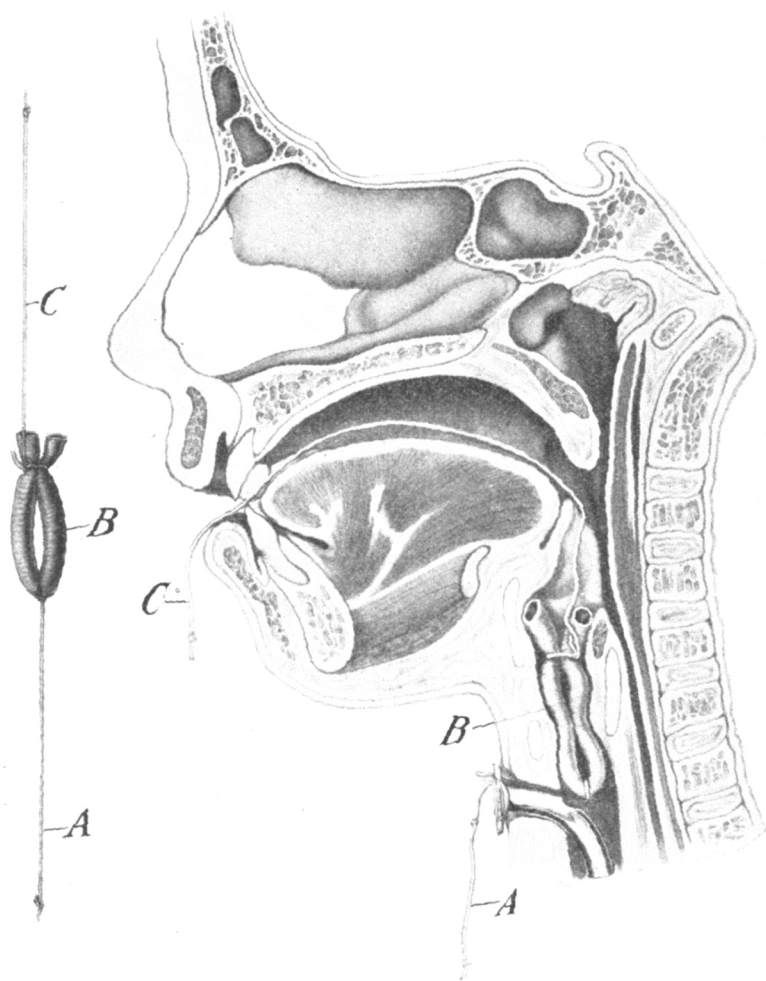


Fig. 1.

Fig. 2.

time this could be supplanted by the double tubing. The advantage of continuous elastic pressure without laryngostomy has already been mentioned. The chief objection to the method lies in the impossibility of oronasal breathing with the tubing in place.

Insertion of a Single Rubber Tube From Below.—Oral breathing can later be reestablished by the following modification of the procedure described above. A piece of rubber tubing of proper length and diameter is selected. A draw string is attached to each end of the tubing and one of the strings is then passed from below into the mouth, drawing the tubing into the larynx. The tracheal canula is reinserted and the tracheal string is then anchored to the plate of the tracheotomy tube, as in laryngostomy.

As soon as the stenosis has become somewhat dilated, oral breathing may also be partly reestablished by introducing a short intubation tube above the tracheal canula. In some cases of laryngeal stenosis, however, it is exceedingly difficult or even impossible to introduce an intubation tube in the usual manner. Under these circumstances, the following method may be employed.

INTUBATION BY TRACTION.

Two small holes (B. B., Figure 3) are bored into the lower end of an intubation tube, one on its anterior surface and the second directly opposite on the posterior surface of the tube (A). A stout silk cord (C) about eighteen inches long is then passed through both these openings in the intubation tube and the ends of the cord are tied together and are allowed to hang from the lower end of the tube. In addition, the head of the intubation tube should always be threaded in the usual manner (E). The tracheal canula is then removed and, as described above, a string about a foot long is now introduced through the tracheotomy opening until it presents in the mouth. The string (C), previously attached to the lower end of the intubation tube, is now tied to the oral end of the string. Traction from below is then made on the tracheal end of the string and, with a guiding finger in the larynx, the intubation tube is drawn into place. The tracheal canula is now replaced, and the string (C) protruding from the neck is fastened to the neck with adhesive plaster.

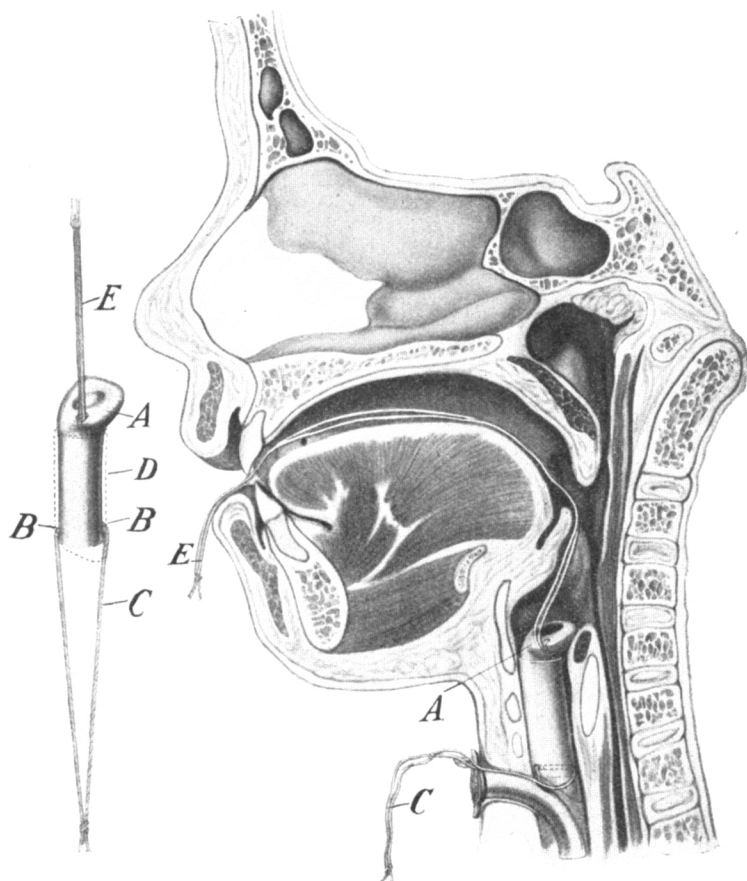


Fig. 3.

Fig. 4.

Following a suggestion by Dr. Lynah, the diameter of the intubation tube may be increased at will by stretching rubber tubing (D) (Figure 3) over the intubation tube. When thus covered, the traction string is then threaded through both the rubber covering and intubation tube at the same time. The rubber covering exerts continuous elastic pressure on the stricture. By allowing the rubber tubing to project slightly beyond the lower end of the intubation tube posteriorly the angle between the intubation and tracheotomy tubes is obliterated, preventing the formation of a spur in the trachea at this point.

Figure 4 shows the intubation tube in situ, with the strings (C and E) attached. In performing intubation by traction the technic, as described above, should be closely followed, since one can exert considerable force by this method. In one case when I neglected to pass the string C through both the lower openings in the tube, the lower lip of the tube caught in the posterior wall of the larynx and made a false passage into the esophagus. Fortunately, the patient made a functional recovery from this accident. Otherwise no bad effects have resulted from the employment of this method.

In the final treatment of these cases the tracheal canula should be left out and clamped Rogers or Lynah intubation tubes may be employed. Spontaneous extubation may also be prevented by employing the anchor string method of fixation which I have described in former publications.¹ According to this method, a long silk thread is tied into an annular groove in the intubation tube. After intubation the thread is drawn through the tracheotomy fistula and fastened to the skin with adhesive plaster.

1. *Lancet Clinic*, October 11, 1913.

Laryngoscope, August, 1916.

LIVINGSTON BUILDING.