A New Mirror-Cannula for Laryngo-Tracheo-
Bronchial Anesthesia, Medication, or
Instillation of Opaque Oils

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Frequently there comes to the laryngologist, bronchoscopist, and
pulmonologist a desire to possess three hands. This is especially
ture during the process of anesthetizing the larynx, trachea, or
bronchi. The usual procedure is to hold the mirror in one hand,
the cannula in the other, using the patient or an assistant to
make traction on the tongue. This means a total of three hands
about the mouth orifice. Traction of the tongue by an assistant
or the patient has a considerable personal variable which ranges
from too much traction resulting in pain and gagging to too little
resulting in almost complete block of the line of vision for the
operator by the elevation of the dorsum of the tongue. If the
patient holds the tongue, there is a constant tendency to retract
it into the mouth even with the most cooperative patient. Manip-
ulative dexterity on the part of the operator has in many cases
developed skills that make anesthesia of the larynx and trachea
relatively simple procedures. On the other hand some operators
even after many years find this procedure cumbersome and occasion-
ally awkward, especially with certain types of patients. Occasion-
ally the tension during this procedure has been such that an
unsuccessful anesthesia has resulted or the patient has become
unwilling to continue with the ordeal.

In view of the personal difficulties with the old procedure which
seem inherent in the method, the author has attempted to sim-
pify the procedure of laryngo-tracheo-bronchial anesthesia by
eliminating the use of the third hand and by making other refine-
ments which result in a rather smooth technique without at any
time obstructing the line of vision. This was done by devising a
simple mirror-cannula which is described below. Proficiency in the
use of this cannula comes rapidly; and at present what was once
an ordeal with certain patients has become a matter of routine.
With the use of the mirror-cannula complete control is had at all
times on the degree of traction of the tongue and the solution
is instilled accurately and economically where intended.

Prior to developing the mirror-cannula consideration was given

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to the ideal requirements for successful and simple anesthesia of the larynx, trachea, and bronchi. It was decided that were a single instrument designed that would permit conformance with the following requirements, an ideal instrument for this procedure could be evolved:

1) A procedure that could be performed by the operator alone without the assistance of the patient or nurse.
2) Lack of bulk to the instrument for easy introduction into the mouth without eliciting undesirable reflexes.
3) Design of such an instrument to closely follow the natural oro-pharyngeal curve without touching too many structures in the mouth, pharynx or larynx.
4) Incorporation into the instrument of a means of holding back the flaccid uvula so that it did not fall unto the mirror and obstruct the line of vision.
5) An instrument that permits an unobstructed view at all times of the posterior portion of the epiglottis and of the vocal cords.
6) An instrument that permits complete control of the solution to be instilled under constant visual guidance.

After much experimentation, mostly by the trial and error method, a mirror-cannula was developed that permitted the above desiderata. Such a cannula is illustrated in Figure 1. The basic parts consist of a stock laryngeal mirror (No. 4) and an Abraham laryngeal cannula of malleable metal. The shortened shank of the mirror is simply soldered to the back of the cannula after molding by hand to the required shape. Multiple clinical trials finally evolved a mirror-cannula with specifications which were considered generally satisfactory without further modification for anesthesia of the larynx, trachea, or bronchi. The following are the specifications for the mirror-cannula:

1) Size of mirror: Number 4 laryngeal mirror, bollable.
2) Length of shank of mirror: 4.5 cm. from edge of attachment to mirror.

FIGURE 1
3) Angle of mirror to the horizontal line: 45 degrees.
4) Angle of hub of cannula to the horizontal line: 30 degrees.
5) Angle of the descending portion of the cannula to the horizontal line: 110 degrees.
6) Distance from the center of the mirror to the curve of the cannula: 0.5 cm.
7) Distance from the center of the mirror to the rounded tip of the cannula: 3.5 cm.

The angle of the mirror to the shank is changed to conform with specification number 3, above, as the original angle with which the mirror comes is not the same. Changing of this angle is made close to the edge of the attachment of the shank to the mirror with the aid of a narrow-nose wire-bending pliers so as not to crack the glass.

Experimentation with sizes 1 to 6 of the laryngeal mirror, but using the same basic specifications proved that the ideal size of mirror was a number 4. The smaller sizes permitted the uvula to occlude vision when it slipped over the anterior portion of the mirror. The larger sizes were found too bulky for introduction and gave an unnecessarily large view of the vocal cords and the surrounding structures.

Variations of the length of the tip, keeping the other specifications constant also revealed enough difficulties to warrant standardization to the 3.5 cm. length of the tip. Shorter distances may be used but have the disadvantage that the tip cannot be placed over the posterior portion of the epiglottis so as to direct the solution between the vocal cords. Generally it was found that with the shorter tips the solution trickled down the anterior portion of the epiglottis and traveled into the pyriform sinuses eliciting a swallowing reflex which made for loss of the solution into the esophagus and failure to anesthetize the larynx. Another disadvantage was that the epiglottis could not be engaged by the tip of the cannula and thus secure its position just above the vocal cords. Longer distances than 3.5 cm. also had several disadvantages. One was that the tip of the cannula became captured between the vocal cords before they could be anesthetized and caused spasm, cough, and gagging. Another disadvantage was that introduction of the longer tip into the natural oro-pharyngeal curve was cumbersome and evoked gagging and salivation.

The 3.5 cm. length of the tip was found to be ideal since it permitted easy introduction into the mouth along the natural oro-pharyngeal curve with only two points of contact: the uvula and the upper, posterior portion of the epiglottis. Since these structures are usually well anesthetized by the preliminary spraying with an atomizer, no undesirable reflexes are elicited when they are touched by the cannula. The posterior portion of the mirror is used to
gently push back the flaccid uvula thus keeping it out of the field of vision and the tip is made to rest gently against the upper posterior portion of the epiglottis at such an angle that the vocal cords are well visualized, permitting the solution to be dropped directly upon them or between them at will without setting up the severe reflexes noted when the tip touched the cords or lies between them.

Attached to the mirror-cannula is a standard Luer-lock syringe which contains the solution to be used. The angulation of the hub is such that vision is not impeded at any time by the bulk of the syringe and has the added advantage that the hand can be kept at a low position and is not in the line of vision.

A feature worthy of mention of this mirror-cannula is that since the tip is also malleable its angle with the horizontal may be changed to suit the occasional patient who has the epiglottis at an angle varying from the normal. By manual angulation of the tip, introduction behind the epiglottis can be accomplished with almost any anatomical variation of the epiglottis. This contingency is apparently rather rare and the degree angle of the tip was changed only once in a series of 180 anesthetizations.

Use of the mirror-cannula, of course, presupposes preliminary anesthetization of the oro-pharyngeal and superficial laryngeal structures with a spray anesthesia from an atomizer as is done with the usual method. Fogging of the mirror is also controlled by heating in the flame of a spirit lamp or hot water.

SUMMARY

1) A simple indirect vision mirror-cannula is described which simplifies laryngo-tracheo-bronchial anesthesia, and instillation of medication or opaque oils.
2) The mirror-cannula is simply constructed of standard parts and can be easily and expeditiously assembled.
3) Use of the mirror-cannula obviates the use of the patient or an assistant to make traction on the tongue.
4) The optimum specifications for such a mirror-cannula are described.

RESUMEN

1) Se describe un sencillo espejo-cánula de visión indirecta que simplifica la anestesia laringo-tráqueo-bronquial y la instalación de medicinas o aceites opacos.
2) Se construye sencillamente este espejo-cánula, usando partes regulares que se pueden armar fácilmente y con prontitud.
3) Con el empleo del espejo-cánula no se necesita que el paciente o un asistente halen la lengua.
4) Se describe la mejor manera de construir el espejo-cánula.