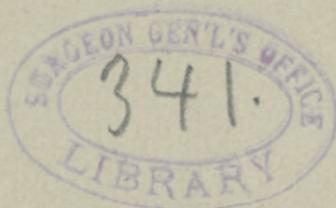


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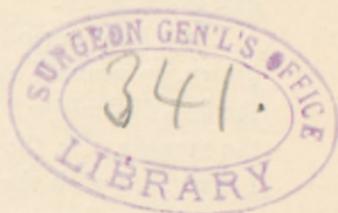
Tracheotomy without the
Cannula.

BY
THOMAS ADDIS EMMET, M. D.,
SURGEON TO THE WOMAN'S HOSPITAL.

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TRACHEOTOMY WITHOUT THE CANNULA.

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THE patient would be spared great discomfort after the operation of tracheotomy if the use of the tube could be dispensed with; moreover, a source of irritation would be removed which by its presence retards the healing process and increases the danger from blood-poisoning.

My thoughts have been recently directed into an old channel by reading the medical reports issued from time to time on the condition of the Emperor of Germany. It has been evident that the instrument in his case has been a constant cause of discomfort while in place, and the usual difficulty attending its insertion or change has been experienced.

This subject has not come within the scope of the line of practice with which the greater part of my life has been identified, but in earlier years my experience with the operation of tracheotomy was unusually great. One of my first literary contributions to the profession was an article on "Œdema Glottidis resulting from Typhus Fever," which was published in the "American Journal of the Medical Sciences," July, 1856. I was directly or indirectly the means of saving the lives of some twenty persons by per-

forming tracheotomy where passive œdema of the glottis had taken place.

At a later period I saved the lives of two children, now grown, on whom I operated for membranous croup. One of the first difficulties I experienced was in the management of the cannula. In the treatment of some of the adult patients I dispensed with the use of the tube entirely, and kept the wound open by means of a thick lead wire passing around the neck. This could be bent to avoid pressure on the vessels, and, through a hole in each end of the wire, a silk suture was secured, which had been passed through the skin and edge of the tracheal wound on each side, and thus the opening was kept patulous.

With both children I used a long silver wire, passed through the skin and trachea, which was so adjusted and twisted sufficiently as to turn the edges of the skin over into close contact with the edge of the opening in the trachea. To avoid making pressure on the vessels, I placed on each side of the neck two corks into which I had made deep cuts to imbed the wire, and, after making the necessary traction to separate the sides of the wound, the ends of the wires were twisted together behind the neck.

A great improvement has doubtless been made in the cannula since the treatment of these cases, but the instrument can never be so perfected that its presence in the trachea will cause no irritation.

The strip of muscular tissue which is inserted, as it were, in the posterior wall along the line of the long axis of the trachea and between the ends of the cartilaginous rings, is exceedingly sensitive to the touch of a foreign body. Muscular contraction can be excited, and often a paroxysm of coughing brought on by the pressure of a probe. When this contraction is brought about, the diameter of the trachea must be proportionately diminished. Through the action

of the reflex system the irritation must be transmitted to the minutest bronchi, so that the capacity of the air-passages becomes greatly lessened as a consequence. Until the wound has healed, it is impossible to prevent the discharges from its surface entering the trachea. The healing process is retarded and the discharge is greatly increased from the irritation of the tube, while its introduction is always attended with difficulty, and with more or less damage to the soft parts.

I believe that it will prove good surgery and a comparatively easy matter to obtain early union between the edges of the skin and the lining membrane of the trachea, and at the same time to preserve the necessary opening into the air-passage. This assertion is based upon my experience in treating diseases of the bladder and urethra in the female, where it is now easy to establish a permanent opening for drainage in chronic cystitis, and in making the "button-hole" opening in the urethra, by uniting with interrupted sutures the mucous membrane of the bladder or of the urethra with the mucous membrane of the vagina. If an early union can be obtained in such friable tissue, so prone to inflammatory action, and with a constant stream of urine flowing over the parts, we may infer that the skin can be made to unite around the opening in the trachea with even less difficulty. An oval opening should be made in the trachea by removing a small portion of tissue on each side, and this can be readily done by the aid of a tenaculum and a pair of curved scissors. A fine needle, about half an inch in length—such a one as I employ for operations about the bladder and urethra—would answer for the introduction of the interrupted sutures around the opening in the trachea. The first suture should be introduced about the middle of the wound on each side, and the others in turn toward each end, using about five to the inch. After they have all been

secured, there would necessarily remain at each end a fold or pucker, since the opening in the skin would be much greater than the one in the trachea. This line should also be closed by fine interrupted sutures, but it would be necessary to include more of the deeper tissues than would be advisable where union of the skin and mucous membrane was desired. A fine silver wire should be used, and this may be introduced by means of a short silk loop attached to the needle. A metallic suture for a case of this kind would be preferable to silk, as it would not excite a local inflammation by being retained an indefinite time. It could also be utilized, by being bent, to act as a splint in giving form to the flap, and the discharges would not follow its course, by capillary attraction, to enter the trachea.

After twisting the wire sutures just sufficiently to bring the parts together, each should be cut off about an inch in length. If properly laid down, they will radiate, as it were, from a common center and lie flat, without producing any irritation.

The success of the operation will necessarily depend on the dexterity of the operator in being able to catch up the skin and subcutaneous tissue so that it will slide over the raw surface, and thus turn in the edge of the skin in close approximation to the edge of the tracheal mucous membrane. After operating on the children I was surprised at the time when noticing the rapid healing of the edges in comparison with other cases. Only a single stitch was used on each side, but even this was sufficient to cover in a great portion of the surface which would otherwise have been left to heal by granulation.

If the details attending the introduction of these sutures are properly carried out, with the necessary care which should be employed in closing any wound, union should promptly take place, and in the shortest possible time. A portion of

the line in direct contact with the edge of the skin and trachea may possibly have to heal by cicatrization, but it would be very limited, and the surgeon could readily keep the granulations in check. The procedure as proposed would certainly reduce the cicatrizing surface to the minimum.

If only the skin, and not the deeper tissues, is brought together, the smallest diameter of the passage would be at the entrance to the trachea, and this diameter could not be encroached upon from without. If the union by cicatrization should be as limited in extent as is maintained, the trachea will be left far more movable than under ordinary circumstances where the parts have been healed by granulation. The small portion of the tracheal tissue which it seems advisable to remove from the edge will offer no obstacle to the final closure, but the opening would remain a mere slit, which could be securely covered by denuding an elliptical surface on the skin, which would be brought together in a fold over it.

