PROLONGED USE OF AN ENDOTRACHEAL TUBE

REPORT OF A CASE

Anesthetists have often speculated as to the possible dangers which might result from allowing a tube to remain in place in the glottis and trachea for long periods of time. Cases of tracheotomy are sufficiently common that we are now convinced that the advantages of a free airway and the ability effectively to remove secretions from the bronchi by suction outweigh the disadvantage of irritation of the tracheal mucosa by the tube. Although some of us prefer to leave a rubber tube in the trachea during the recovery of a patient from anesthesia rather than risk respiratory obstruction, we are apparently not yet convinced that a tube allowed to remain in the glottic opening for a long period of time may not engender complications.

MacEwen (1) observed and commented on the fact that an individual soon develops a tolerance to the presence of a tube in his glottis and experiences little discomfort from it. He felt that tracheotomy should be performed when obstruction to respiration is due to the presence of a foreign body in the air passages, whereas he preferred intubation in cases in which the obstruction was likely to be of short duration. He said that there are good reasons "for preferring tubes when there are effusions of blood or serum, or collections of pus into or about the submucous laryngeal tissue, or when anything overhangs or threatens to occlude the laryngeal orifice." He expressed the opinion that the patient who has been intubated is able to breathe air which is warm, moist, and "filtered"; whereas when tracheotomy has been performed a cold, dry atmosphere impinges upon the tracheal walls. The following case illustrates the utility of such a technic.

CASE REPORT

A healthy man of 24 had sustained, in an automobile accident, a fractured left forearm, and a compound, comminuted, and infected fracture of the mandible. Some blood and secretions were present in the pharynx, and the patient had received 1/6 of a grain of morphine and 1/150 of a grain of scopolamine before anesthesia was to be induced for the reduction of these fractures. Nasotracheal intubation was decided upon because the lower teeth were to be fixed to the upper teeth by wires. Since the patient's face was lacerated and painful, induction was accomplished by the intravenous administration of 1/3 of a gram of pentothal in 5 per cent solution. Through the right nostril a soft rubber endotracheal tube, 12 mm. in diameter, was passed into the pharynx, some resistance being encountered in the vicinity of the middle turbinate. Laryngoscopy was rapidly performed and the tube was inserted under direct vision into an open glottis. This technic was decided upon for three reasons: first, the depression of respiration resulting from the barbiturate made successful blind intubation improbable; second, the pharynx contained foreign matter; third, the comminuted mandible offered none of the usual obstacles to laryngoscopy. The tube had been lubricated with an ointment containing 1 per cent of "Diothane"; after intubation 4 per cent cocaine was sprayed through the tube on inspiration. A mixture of nitrous oxide and oxygen was then administered by the "semi-closed" endotracheal technic, and produced smooth anesthesia during the two hours and a quarter occupied by the operation.

At the close of the operation the wired mandible was immobile, there was still some bleeding into the mouth and pharynx, and a marked swelling of the tissues between the mandible and the thyroid cartilage was evident. It seemed probable that further swelling would occur during the next few hours, and that extubation would expose the patient to the risk of complete respiratory obstruction and necessitate the performance of tracheotomy. It was therefore decided to allow the endotracheal tube to remain in place. A gastric tube was passed through the left nostril.

The patient recovered consciousness almost immediately and the situation was explained to him. He was provided with paper and pencil so that he might communicate with his attendants. He behaved very well and denied any excessive discomfort from the presence of the endotracheal tube. Occasionally he coughed up some

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mucus tinged with blood, and the spray of cocaine was repeated twice through the tube to minimize this. The endotracheal tube was probably partially obstructed by a kink in its course through the nose, for it proved impossible to pass a catheter for the aspiration of secretions more than 4 inches into it. The patient could, however, blow his secretions to this point in the tube, and from there they were removed by aspiration every time he coughed. Neither retching nor vomiting occurred at any time after operation.

During the night after operation the patient became restless. His temperature rose to 104 F. and his pulse rate to 140. Sedation was partially achieved by the administration of 2 drachms of paraldehyde, diluted with warm water, through the gastric tube. The next morning he was still restless, and his general condition and flushed appearance suggested the presence of infection. The swelling of the neck had decreased. In the afternoon it was found that when the gastric tube was removed the patient could breathe through that nostril around the endotracheal tube when the orifice of the latter was occluded. A few moist adventitious sounds could be detected at the left base, but the breath-sounds remained vesicular. That evening he appeared to have difficulty in breathing and oxygen was administered through the endotracheal tube.

On the morning of the second day, the swelling of the neck having decreased still further, the tube was removed exactly fifty-one hours after its insertion. The patient was able to phonate normally at once although the condition of his mouth rendered normal speech impossible, and stated that he felt greatly relieved by the removal of the tube. He denied any discomfort in the region of the glottis, and said that the slight pain which he had previously experienced in the right side of his chest had disappeared. He seemed able to breathe through his mouth and nose without difficulty. Three weeks after the operation, having recovered, he was sent home. When last seen, over two months after the operation, there had been no complications.

COMMENT

Tubes allowed to remain in the trachea for long periods of time should probably be removed periodically to be cleaned. When this tube was examined, at extubation, its lumen, though still patent, was found to be narrowed by debris and mucus adhering to its inner wall. It might have been removed twenty hours earlier than it was. After thirty hours it had become partially obstructed by clotted mucus and gave rise, from then on, to some obstruction to respiration. Those in charge of the case were naturally reluctant to remove it until all danger of obstruction of the air passages was past. Nevertheless the fact that it was left in situ after operation probably spared the patient a tracheotomy.

Although cases in which the prolonged use of a laryngeal airway is of value are rare, I believe an anesthetist will sooner or later encounter such a one. I am aware of several similar cases in the experience of other workers, and claim no originality in the matter. The purpose of this report is rather to draw attention to this therapeutic use of intubation, and to solicit the publication of further evidence on the subject by others.

REFERENCE

1. MacEwen, W.: Clinical Observations on the Introduction of Tracheal Tubes by the Mouth Instead of Performing Tracheotomy or Laryngotomy. Brit. M. J. 2: 122–124 and 163–165 (July) 1880.

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TECHNICAL SUGGESTION

The routine abduction of one of the patient's arms on a narrow well-padded board during the operation rarely inconveniences the surgeon or his assistants during operations below the diaphragm. The accessibility of the arm makes for less confusion when intravenous therapy or anesthesia is required or when adjustments of the blood pressure apparatus are necessary during the operation. J. K. P.

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