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Difficult Extubation Due to Transfixation of a Nasotracheal Tube by a Kirschner Wire

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Inadvertent insertion of a Kirschner wire through a nasotracheal tube is a rare complication which is potentially dangerous and unusually difficult to manage.

REPORT OF A CASE

An 18-year-old male patient was scheduled for an open reduction and internal fixation of a depressed left trimalar fracture that had resulted from a motorcycle accident. Six days prior to the operation, the patient had undergone a burrhole procedure of the left frontal bone, exploration of the left orbital floor, and open reduction with internal fixation of the left trimalar fracture uneventfully. Due to poor reduction of the facial fracture, a second operation was scheduled.

After a smooth induction of anesthesia, a Rusch 34-French endotracheal tube was inserted through the right nostril without difficulty. The surgeon had requested nasotracheal intubation because he might have to approach the fracture through the oral vestibule and the maxillary sinus. Upon examination of the anesthetized patient, however, he decided to reduce and immobilize the fracture transcutaneously with a threaded Kirschner wire. A satisfactory result was obtained on the first attempt. No anesthetic or airway problem was encountered intraoperatively.

As the patient was emerging from anesthesia, the endotracheal tube became partially obstructed with secretion and blood. A 14-French suction catheter could not be inserted into the endotracheal tube far enough to clean the endotracheal tube. The anesthetist decided to extubate the trachea, but soon realized that the endotracheal tube was transfixed by the Kirschner wire to bony structures. Repeated attempts failed to remove the tube, and the patient began to react to the endotracheal tube vigorously with bucking, and breath-holding.

To ease the patient's distress, the tracheal end of the endotracheal tube was pulled out of the trachea transorally.

This emergency maneuver provided great relief to the patient, who was then able to breathe smoothly and awoke promptly. Subsequently, the endotracheal tube had to be removed by the following complex maneuvers: 1) disconnecting the adaptor from the endotracheal tube; 2) incising the tube longitudinally to the level of the wire deep inside the nose, approximately 3.5 cm from the skin, to allow access to the wire for the next maneuver; 3) folding and cutting the tube semicircumferentially at the level of the wire; 4) folding the incised portion of the tube along the longitudinal incision into the lumen to allow removal of the tube by sliding it off one side of the wire into the nasopharynx and out through the mouth.

DISCUSSION

The above-described case illustrates an unusual complication of use of the endotracheal tube.^{1,2} Such a complication is fraught with dangers. First, the wire may cut the cuff-inflating line of the endotracheal tube. It may tent, kink, or lacerate the tube. It decreases the effective lumen of the tube. It traps blood and secretion. It prevents either suctioning or removal of the tube. Its protruding end prevents proper application of the face mask.

Should the endotracheal tube become totally obstructed, immediate deflation of the cuff may allow the patient to breathe around it. The tracheal end of the tube may then have to be pulled out of the trachea transorally. To secure the airway, the anesthetist must be ready to insert another endotracheal tube orally. If oral manipulation of the endotracheal tube is not possible, as in many instances when concomitant injury requires closure of the mouth by wires and archbars, the Kirschner wire may have to be removed and the wires and archbars may have to be cut, so that an airway can be established.

It is our recommendation that, intraoperatively, whenever there is a possibility of inadvertent fixation of the endotracheal tube at any level, by suture or wire, the tube should be moved up and down slightly to ensure its mobility.

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