

A Secure Method of Nasal Endotracheal Tube Stabilization with Suture and Rubber Tube

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A new method of stabilizing the nasal endotracheal tube was described. The tube was secured to the anterior portion of the nasal septum with braided silk thread, which was tightened over the rubber tube to keep air route of the cuff open. There found no complications such as unplanned extubation, necrosis and infections of the nasal septum.

Key words : Stabilization, Silk thread, Rubber tube, Nasal intubation

INTRODUCTION

Nasal endotracheal intubation is used for the most operations for the oral disease and in cases which needed long term respiratory management. Nasal endotracheal tube is usually stabilized at the top of the nose or facial skin with adhesive tape. However, when the tube is stabilized with adhesive tape, unplanned extubation is not rare, and can be life-threatening. We contrived a new method which secures stabilization of the endotracheal tube.

MATERIALS AND METHODS

Thirty cases who underwent the operation for the oral with disease under general anesthesia with nasal endotracheal intubation from April 1994 to March 2000 (Table 1). In all cases, spiral tube[®] was used and stabilized with our method. The reliability of the method, pressure sore, accidental extubation, necrosis and infection of the nasal septum were investigated.

PROCEDURE OF STABILIZATION

1. After nasal endotracheal intubation, anterior portion of the nasal septum which lacks the cartilage tissue were pierced with 2-0 braided silk thread from the nostril of the intubation side to the other side, and returned to the tube side. A knot was made not to press

the soft tissue of the nasal septum (Fig. 1).

2. The endotracheal tube was stabilized by the thread over which the rubber tube was intervened. Used rubber tube was a part of the drip infusion route (Fig. 2).
3. The secure stabilization of the endotracheal tube was confirmed (Fig. 3).

RESULTS

No episode of dislocation of tube, unplanned extubation, necrosis or infection was encountered in all cases.

DISCUSSION

Nasal endotracheal intubation is used for most of operations of the oral disease and cases which need long term respiratory management. Several methods of rigid endotracheal tube fixation are reported, however they are for oral endotracheal tube [1-4].

Nasal endotracheal tubes is usually stabilized at the top of the nose or facial skin with adhesive tape. Dermatitis or pressure sore of the skin and unplanned extubations are encountered as the complications of the stabilization technique with adhesive tape. Unplanned extubation is not rare during the operation or in the surgical intensive care unit [5]. Particularly, in the oral surgery, because the endotracheal tube is under the sterilized clothes, and because anesthesiologists are not able to manage the tube during

Table 1 CLINICAL SUMMARY

case No.	age/sex	diagnosis	operation method	operation time (hr:min)	duraion of intubation (hr)
1	49/F	tongue cancer	hemiglossectomy, ND, RAMC	6:20	27
2	55/F	tongue cancer	hemiglossectomy, ND, RAMC	8:45	26
3	73/F	tongue cancer	hemiglossectomy, ND, RAMC	7:50	70
4	56/M	cancer of mouth floor	tumor resection, ND, RAMC	7:45	29
5	80/F	tongue cancer	hemiglossectomy, ND, RAMC	5:45	171
6	69/F	gngival cancer of mandible	segmental resection, ND, RAMC	7:25	30
7	63/M	gngival cancer of mandible	segmental resection, ND, RAMC	6:45	26
8	61/F	tongue cancer	hemiglossectomy, ND, RAMC	6:03	47
9	73/M	gngival cancer of mandible	segmental resection, ND, RAMC	6:05	29
10	64/M	buccal cancer	tumor resection, ND, RAMC	7:47	80
11	35/M	tongue cancer	subtotal glossectomy, bil ND, RAMC	10:40	82
12	54/M	tongue cancer	hemiglossectomy, ND, RAMC	7:15	71
13	54/M	tongue cancer	subtotal glossectomy, bil ND, RAMC	10:20	74
14	51/M	tongue cancer	subtotal glossectomy, bil ND, RAMC	9:00	98
15	44/M	tongue cancer	hemiglossectomy, ND, RAMC	6:56	46
16	70/M	lower lip cancer	tumor resection, ND, RAMC	11:30	94
17	59/M	tongue cancer	subtotal glossectomy, bil ND, RAMC	10:21	124
18	56/M	buccal cancer	tumor resection, ND, fore arm	7:35	28
19	48/F	cancer of mouth floor	tumor resection, ND, RAMC	7:30	47
20	70/M	cancer of mouth floor	tumor resection, ND, RAMC	8:35	52
21	72/F	gngival cancer of mandible	segmental resection, ND, RAMC	7:35	46
22	59/M	cancer of mouth floor	tumor resection, ND, RAMC	7:55	152
23	61/M	tongue cancer	hemiglossectomy, ND, RAMC	7:25	98
24	70/M	tongue cancer	hemiglossectomy, ND, RAMC	8:00	28
25	44/M	buccal cancer	tumor resection, ND, RAMC	12:15	51
26	64/M	buccal cancer	tumor resection, ND, RAMC	7:56	48
27	81/M	buccal cancer	tumor resection, ND, RAMC	7:15	26
28	63/M	tongue cancer	hemiglossectomy, ND, RAMC	5:55	50
29	56/F	tongue cancer	hemiglossectomy, ND, RAMC	7:55	98
30	34/F	tongue cancer	hemiglossectomy, ND, RAMC	5:10	22

ND (neck dissection), bil ND (bilateral neck dissection), RAMC (reconstruction with Rectus Abdominis free flap) fore arm (reconstruction with Radial Fore Arm free flap)

the operation, unplanned extubation and bending of the tube which obstructs the air way can occur. We use spiral tube[®] and fixation of the tube to the nasal septum, for evading these complications. However, when the tube is tightened directly, air route of the cuff is also tightened (Fig. 4), which unables to control the cuff pressure consequently.

The cuff pressure changes were reported in general anesthesia with or without N₂O gas [6, 7]. Decrease of the cuff pressure was also reported during long term mechanical ventilation [8]. Consequently the cuff pressure should be control frequently. Using the rubber tube secures stabilization of the endotracheal tube while the air route of the cuff

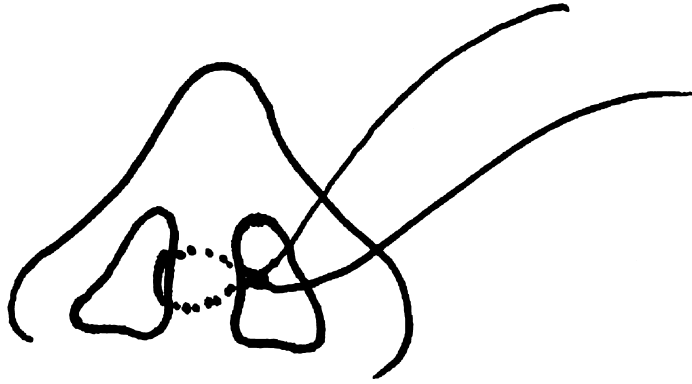


Fig. 1 a schematic view.
After nasal endotracheal intubation, anterior portion of the nasal septum which lacks the cartilage tissue were pierced with 2-0 braided silk thread from the nostril of the intubation side to the other side, and returned to the tube side. A knot was made not to press the soft tissue of the nasal septum.

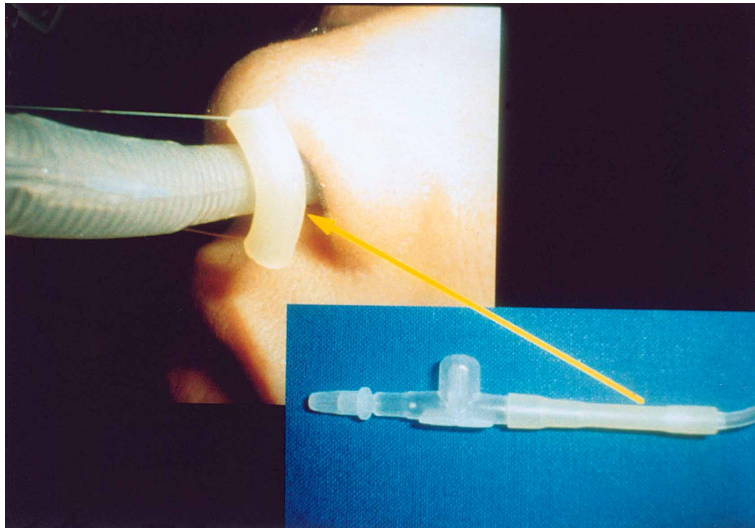


Fig. 2 The endotracheal tube was stabilized by the thread over which the rubber tube was intervened. Used rubber tube was a part of the drip infusion route.

kept open. In all cases which underwent this method, neither unplanned extubation, necrosis of the nasal septum at the fixed region or inability to control the cuff pressure was encountered.

The disadvantages of our method are considered as follows: 1. The local anesthesia is needed for the patient whose consciousness level is clear. 2. The procedure of this method is more difficult than stabilization

with adhesive tape. 3. In an occasion of emergency extubation, such as obstruction of the tube, the removal of suture is needed. However, it is possible to solve these problems to get skills and to have scissors or scalpel at the bedside continuously. This stabilization method is considered useful for cases both of surgery of and long term mechanical ventilation.

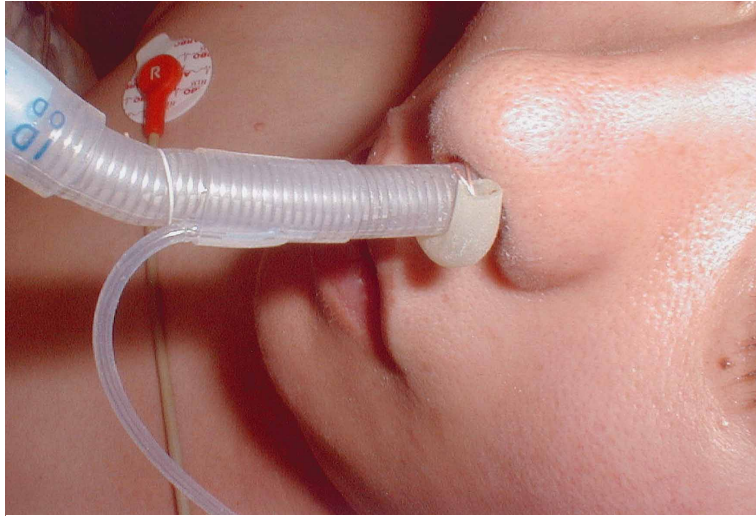


Fig. 3 The secure stabilization of the endotracheal tube was confirmed.

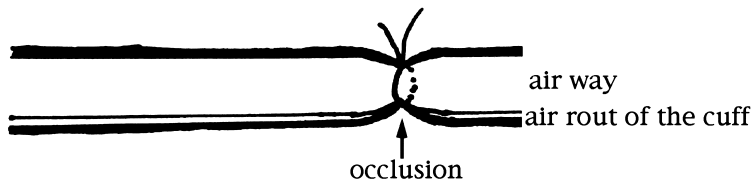


Fig. 4 a schematic view.
The tube is tightened directly, air route of the cuff is also tightened.

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