Patient Safety & Quality Improvement: Multidisciplinary Total Laryngectomy Education

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ABSTRACT

OBJECTIVE

The nuances of post total laryngectomy care are taught early to Otolaryngology residents in order to prevent or appropriately manage potentially devastating complications. Despite adequate training to Otolaryngology residents, the authors have identified post-laryngectomy misidentification as a problem in settings involving those less familiar with this subset of patients. We present our experience implementing a patient safety and quality improvement (PSQI) initiative by means of a multidisciplinary education protocol aimed to reduce laryngectomy misidentification at a tertiary care center.

METHODS

A review of all total laryngectomy patients presenting to the emergency department between November 2016-December 2017 was performed to identify misidentifications or airway management errors. With most acute adverse airway events occurring in the emergency department setting, we set out to provide an educational intervention to emergency department personnel. Pre- and post-educational testing was used to gauge competence.

RESULTS

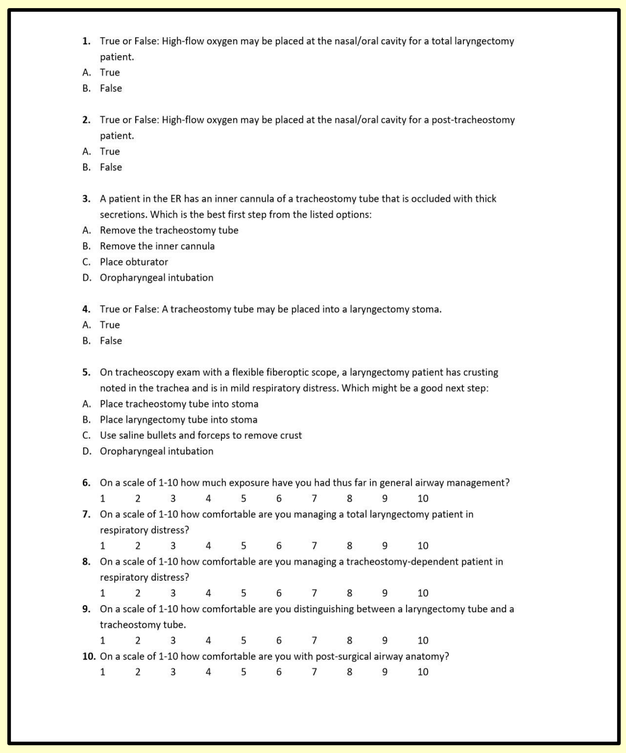
Knowledge gaps regarding total laryngectomy airway management are the main cause for misidentification and adverse events in an emergency room setting. After the implementation of an educational curriculum, the number of preventable adverse airway events involving total laryngectomy patients in our emergency department was reduced to zero.

CONCLUSION

Reduction in post-laryngectomy airway management complications resulting from laryngectomy misidentification was achieved via a team-based approach with careful attention to education and support for emergency room medical staff. Our future aim is to provide education to all hospital personnel engaging with post-laryngectomy patients in order to facilitate appropriate, safe, and timely care of these complex patients.

INTRODUCTION

- Improving patient outcomes requires:
  - ➢ Continued education
  - ➢ Recognizing preventable events
  - ➢ Implementation of quality improvement initiatives[1]
- Treatment of total laryngectomy patients by those unfamiliar with the altered surgical airway anatomy can lead to confusion and near-miss events
  - ➢ We noted most of these events occurred in the emergency department (ED) at our tertiary care institution
- We implemented a patient safety & quality improvement (PSQI) initiative by means of a multidisciplinary education protocol regarding total laryngectomy airway care
- Our aim was to reduce ED laryngectomy misidentification events at our institution to zero



1. True or False: High-flow oxygen may be placed at the nasal/oral cavity for a total laryngectomy patient.
A. True
B. False

2. True or False: High-flow oxygen may be placed at the nasal/oral cavity for a post-tracheostomy patient.
A. True
B. False

3. A patient in the ER has an inner cannula of a tracheostomy tube that is occluded with thick secretions. Which is the best first step from the listed options:
A. Remove the tracheostomy tube
B. Remove the inner cannula
C. Place obturator
D. Oropharyngeal intubation

4. True or False: A tracheostomy tube may be placed into a laryngectomy stoma.
A. True
B. False

5. On tracheoscopy exam with a flexible fiberoptic scope, a laryngectomy patient has crusting noted in the trachea and is in mild respiratory distress. Which might be a good next step:
A. Place tracheostomy tube into stoma
B. Place laryngectomy tube into stoma
C. Use saline bullets and forceps to remove crust
D. Oropharyngeal intubation

6. On a scale of 1-10 how much exposure have you had thus far in general airway management?
1 2 3 4 5 6 7 8 9 10

7. On a scale of 1-10 how comfortable are you managing a total laryngectomy patient in respiratory distress?
1 2 3 4 5 6 7 8 9 10

8. On a scale of 1-10 how comfortable are you managing a tracheostomy-dependent patient in respiratory distress?
1 2 3 4 5 6 7 8 9 10

9. On a scale of 1-10 how comfortable are you distinguishing between a laryngectomy tube and a tracheostomy tube.
1 2 3 4 5 6 7 8 9 10

10. On a scale of 1-10 how comfortable are you with post-surgical airway anatomy?
1 2 3 4 5 6 7 8 9 10

Figure 1
Total laryngectomy pre- and post-test

METHODS

- Exempt from review by our institution's IRB
- Review of total laryngectomy patients presenting to the ED between November 2016 – December 2017 to identify laryngectomy misidentification events
- Misidentification events included:
  - ➢ Error type 1: ED healthcare provider misinterpreted laryngectomy stoma for a tracheostomy stoma
  - ➢ Error type 2: Initiation of inappropriate airway management for total laryngectomy anatomy
- Intervention:
  - ➢ 10 question pre-test given immediately prior to our education intervention (Figure 1). Testing knowledge and comfort level with total laryngectomy airway interventions
  - ➢ Education intervention
    - 45-minute lecture
    - Visual aids, pamphlets
    - Emergency airway management algorithm for total laryngectomy patients[2]
  - ➢ Post-test given 1 year after our educational session

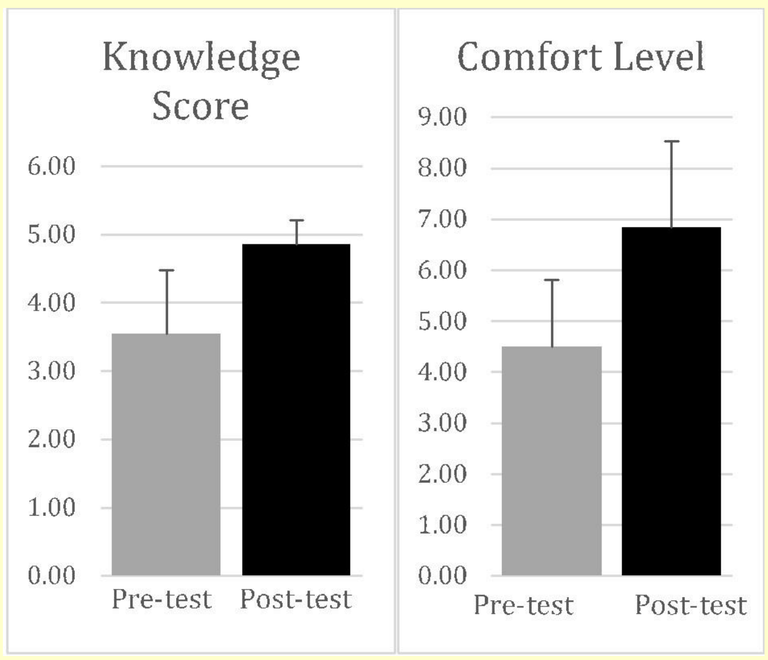


Figure 2
Comparison of pre and post-test knowledge and comfort level

RESULTS

- This was our first plan-do-study-act (PSDA) cycle
- Four instances of total laryngectomy misidentification occurred in our ED during our review period
- No significant life-threatening outcomes or deaths identified
- N= 20 respondents to pre- and post-test (Figure 2)
  - ➢ Knowledge
    - Pre-test score 3.55/5 compared to post-test score of 4.85/5 (p=0.00000067)
  - ➢ Comfort level
    - 4.5/10 on pre-test compared to 6.8 on post-test (p=0.000014)
- After implementation of our educational intervention for ED healthcare personnel, the number of preventable adverse airway events and misidentifications was reduced to zero

DISCUSSION

- There has been a shift towards developing a greater awareness for PSQI and integration into surgical curricula
- Post total laryngectomy misidentification for a tracheostomy was the most common cause for inability to effectively management emergent airway
  - ➢ Gap in knowledge was the main cause of misidentification
- Only 2% of PSQI projects within otolaryngology identified residents as teachers as a means of intervention[3]
  - ➢ Our intervention was well-received
  - ➢ Led to significant increase in ED provider knowledge and comfort level

REFERENCES

1. Zoutman DE, Ford BD. Quality improvement in hospitals: barriers and facilitators. *International journal of health care quality assurance.* Feb 13 2017;30(1):16-24.
2. McGrath BA, Bates L, Atkinson D, Moore JA. Multidisciplinary guidelines for the management of tracheostomy and laryngectomy airway emergencies. *Anaesthesia.* Sep 2012;67(9):1025-1041.
3. Gettelfinger JD, Paulk PB, Schmalbach CE. Patient Safety and Quality Improvement in Otolaryngology Education: A Systematic Review. *Otolaryngology--head and neck surgery : official journal of American Academy of Otolaryngology-Head and Neck Surgery.* Jun 2017;156(6):991-998.

CONCLUSION

- Successful reduction in post total laryngectomy airway management complications resulting from total laryngectomy misidentifications was achieved via a team-based educational approach