Retained Tracheostomy Stay Suture with Migration into the Trachea: a case report.

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Abstract

The stay suture technique (SST) helps ensure safe replacement of the tracheostomy tube after accidental decannulation. We describe a patient found to have a retained stay suture in the glottis 2 weeks post-decannulation. It is important to appreciate the possible complications associated with SST, including airway compromise, infection, and laryngospasm.

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Running Title: Airway Migration of Tracheostomy Stay Suture

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Key Clinical Summary: We review the literature and present a patient case wherein the tracheostomy stay suture migrated to the airway. Although no significant complications arose, airway foreign bodies present great risk for airway compromise, infection, or laryngospasm.

Introduction

Tracheostomy is a potentially life-saving procedure to secure a patient's airway. There have been many techniques developed in order to mitigate risks of tracheostomy tube displacement, including the stay-suture technique (SST) and Bjork flaps, among others. SST refers to the placement of sutures either around a tracheal ring or between the skin and lower trachea to ensure correct replacement of the tube into trachea in case of accidental decannulation and to reduce risk of false passage. While SST has been shown to reduce mortality associated with accidental decannulation, it also presents potential complications associated with introducing foreign material in close proximity to the airway. This report reviews the current literature regarding retained tracheostomy stay sutures and highlights a unique presentation of a patient with a retained tracheostomy stay suture in the airway following decannulation.

Case Report:

A 53-year-old male underwent surgical tracheostomy during hospitalization for a cerebrovascular accident in April of 2021. During the operation, three Prolene stay sutures were placed (one superior on a trapdoor incision of the trachea, and one left, and one right). On postoperative day 7, the tracheostomy tube was changed to a smaller size. The stay sutures remained in place. Approximately three weeks after surgery, the patient was ultimately discharged from the hospital to a rehabilitation facility with the tracheostomy tube in place. He was decannulated at the facility about six weeks after tracheostomy tube placement without complication, although it is unclear if it was an intentional or accidental decannulation. He was stable without the tracheostomy and the facility opted not replace the tube, allowing the stoma to close. He reported subjective hoarseness, but denied any other issues after decannulation. A few weeks later, during fiberoptic endoscopic evaluation of swallowing (FEES) with the Speech and Language Pathology team at the rehabilitation facility, there was a string-like object noted in his airway on exam, and the patient was sent to the emergency department for further evaluation. At the hospital, the Otolaryngology team performed flexible laryngoscopy in the emergency department, which confirmed the presence of what appeared to be a Prolene suture in the glottis. The patient's stoma had closed with minimal granulation and no evidence of suture in the neck. The patient was urgently taken to the operating room for direct laryngoscopy and removal of the foreign body.

The patient was orotracheally intubated uneventfully. Upon inspection of the glottis, a Prolene suture was seen sitting lodged between the endotracheal tube cuff and the glottic airway (**Figure 1)** . Using a 0-degree rigid telescope and grasping forceps, the suture was grasped and easily removed. The cuff of the endotracheal tube was deflated and the tube withdrawn for inspection of the trachea and mainstem bronchi. Minimal inflammation was noted at the level of the first and second tracheal ring. No further foreign body was identified. The patient uneventfully recovered with no complication.

Discussion

This case reports a patient with a retained tracheostomy stay suture that migrated into the airway. Although there were no significant complications associated with the patient presentation, airway foreign bodies present great risk for airway compromise as well as possible nidus for infection or laryngospasm. Retained foreign bodies, especially in proximity to the airway, are an example of a surgical "never event." Although stay sutures are intentionally left in place following tracheostomy, it is of utmost importance to ensure removal when the stoma has matured and the sutures are no longer indicated. While an uncommon complication in the literature, this report highlights importance of accounting for all foreign materials during management of the airway even in the weeks after the procedure is completed.

Accidental tracheostomy tube decannulation presents a life-threatening complication, with incidence rate reported between 0.35-2.7%, with tracheostomy complication mortality rates ranging from 0.5-3%, due pri-

marily to accidental decannulation and tube obstruction[1]. SST represents a procedure to reduce the risk of mortality associated with accidental decannulation. One study compared SST vs. traditional tracheostomy without SST, finding that SST (n = 104) experienced no deaths while traditional tracheostomy had 3 deaths due to unexpected decannulation (n = 101, p = 0.024)[1]. While SST may reduce adverse events due to accidental decannulation, the risks of this technique must be taken into consideration including presumed increased operative time to place the stay sutures as well as the risk of retained foreign body.

There are only three other case reports in the literature describing migration of a tracheostomy stay suture into the airway. Rachakonda et al. (2001)[2] describes a patient who required surgical tracheostomy placement following vehicular trauma and subsequently downsized to a fenestrated tracheostomy tube. In the week following tube exchange, patient experienced increased secretions, tachycardia, hypertension and hypoxia, with nursing staff noting string material extruding from tracheostomy tube. Upon examination of tracheostomy tube during partial removal, it was noted that the stay suture had migrated into the stoma through the fenestration in the tracheostomy tube. Another report by Joshi et al. (2010)[3] describes a patient who had a history of tracheostomy tube placement following hypercapnic respiratory failure with subsequent successful decannulation who had incidental anterior tracheal mucosal irregularity on routine chest imaging for lung transplant evaluation. Flexible bronchoscopy revealed retained suture material at the previous tracheostomy site from retained stay suture. Brown et al. (2010)[4] describe a patient complaining of throat irritation and cough nine years following decannulation of a tracheostomy tube. In office flexible laryngoscopy revealed a suture extending from tracheal wall through the glottis. While in all cases the suture material was removed without complication, each case, including our own, required an extra procedure under general anesthesia, which could have been prevented with proper postoperative care.

Conclusion:

SST is useful in preventing complications from accidental decannulation, but as with all techniques, there can be drawbacks. Here we report an additional case of a preventable complication related to SST. Although a retained stay suture migrating into the airway rare, we feel that bringing attention to this "never event" is important as tracheostomy technique continues to evolve.

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Figure 1: Intraoperative endoscopic visualization of a retained stay suture with migration into the airway at the level of the glottis