Case Report

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Removal of a silicone tracheal stent retained for 15 years: A novel technique using an endotracheal tube cuff when rigid bronchoscopy is not feasible

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Abstract:

Long-term silicone airway stents may present challenges during removal, particularly when rigid bronchoscopy cannot be performed. We present the case of a 46-year-old woman with a tracheoesophageal fistula who had a silicone stent placed 15 years earlier following surgical repair after difficult intubation during hysterectomy. Due to the tracheal anatomy, rigid intubation was unsuccessful at that time, necessitating prolonged stent placement. Recently, the patient presented with dyspnea and wheezing, and bronchoscopy revealed distal stenosis near the stent. In our clinic, flexible bronchoscopy and balloon dilation were performed. Initial attempts to remove the stent using foreign-body forceps were unsuccessful due to fragmentation. The stent was ultimately removed using an endotracheal tube cuff, a technique that, to our knowledge, has not been previously described. Following stent removal, cryotherapy was applied to treat granulation tissue, and follow-up bronchoscopy demonstrated significant improvement. This case, representing one of the longest reported follow-ups of a silicone airway stent, highlights an effective alternative technique for stent removal that avoids high-risk surgery and may contribute to airway management strategies.

Keywords:

Bronchoscopy, long term silicone stent, removal technique

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Introduction

The removal of long-term silicone airway stents in the absence of rigid bronchoscopy is technically demanding. In this report, we present a case of successful stent removal in a patient who could not undergo rigid bronchoscopy and had been followed with a stent for many years.

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Case Report

A 46-year-old female patient underwent surgical repair of the esophagus and placement of a silicone tracheal stent due to a tracheoesophageal fistula that developed following difficult intubation during hysterectomy in 2008. Previous attempts to remove the stent at the referring center were unsuccessful due to failed rigid intubation, resulting in the stent remaining in situ for 15 years. Three months before presentation, the patient began experiencing shortness of breath and wheezing. Bronchoscopy performed at the referring center revealed stenosis distal to the stent, and the patient was referred to our clinic for further evaluation and management. The patient was taken to the operating room for rigid bronchoscopy under general anesthesia. However, insertion of a rigid bronchoscope was not possible due to the position of the trachea [Fig. 1a]. Therefore, flexible bronchoscopy was performed through a laryngeal mask airway (LMA). A silicone tracheal stent measuring 16 mm in diameter and 8 cm in length was visualized approximately 2 cm below the cricoid cartilage. A distal stenotic segment causing approximately 80% narrowing of the lumen was observed [Fig. 1b]. The stenotic area was dilated using a balloon. An attempt was then made to remove the stent with flexible foreign-body forceps; however, the stent could not be removed because it fragmented [Fig. 1c]. Due to airway narrowing caused by the stent, a small-diameter (6 mm) endotracheal tube was advanced through the stent under bronchoscopic guidance using a thin bronchoscope. The tube cuff was inflated distal to the stent, and the stent was removed together with the tube under bronchoscopic guidance [Fig. 2]. No airway complications occurred during or after the procedure, and no airway injury was observed. Cryotherapy was applied to the granulation tissue that had formed due to the stent. Control bronchoscopy performed one month later showed significant improvement in the stent-related granulation tissue. The residual stenosis remained at approximately 50% and did not worsen during the two-year follow-up period [Fig. 3].

Discussion

Iatrogenic tracheoesophageal fistula (ITOF) is an uncommon yet potentially serious complication of intubation, reported in 0.03–4% of cases and occurring more frequently in patients requiring mechanical ventilation.[1] Surgical intervention is the primary approach for treating ITOF, aiming to close the fistula and prevent recurrence. When ITOF results from acute trauma during intubation, emergency surgical repair, typically involving either flap or primary repair, is often highly effective and may not require additional airway support.[2] However, if surgical closure is not feasible or if post-surgical tracheal stenosis develops, stent placement may become necessary. In such cases, the stent should be removed once the airway has sufficiently healed.[3]

In our patient's case, it remains unclear why a stent was placed after surgery and why it was not removed earlier. Attempts were made to remove the stent during follow-up; however, these attempts were unsuccessful due to difficulties in intubating the patient with a rigid bronchoscope, likely related to postoperative anatomical changes in the trachea. The ultimate goal of airway stenting is to achieve a stent-free airway. However, complications may arise when silicone stents remain in place for prolonged periods. Common late-stage complications of stenting include granulation tissue formation (76%), stent migration (70%), and mucostasis (17%).[4,5]

To our knowledge, this case represents one of the longest reported durations of silicone stent retention, with

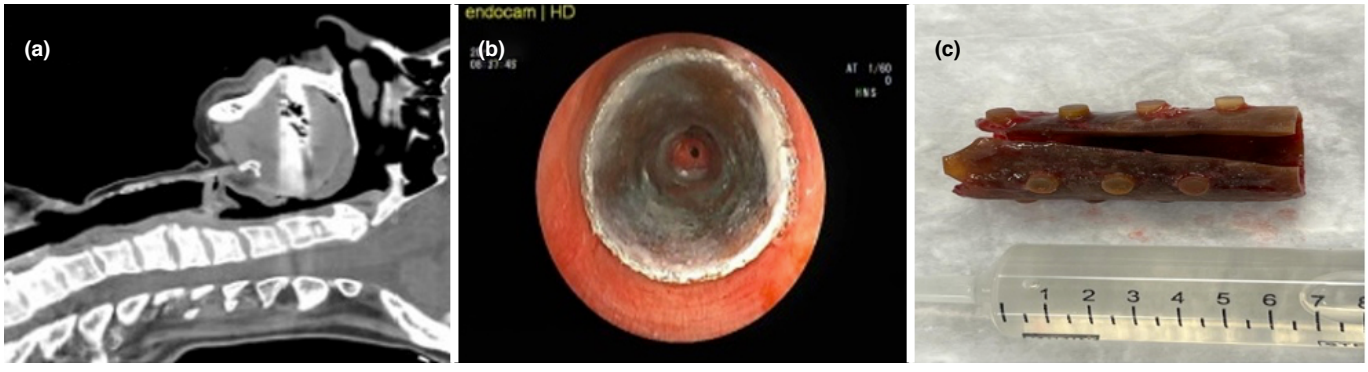

Figure 1: (a) Position of the trachea on a sagittal computed tomography (CT) image. (b) Bronchoscopic view of the stent and the stenosis distal to the stent (c) Image of the removed stent, with debris resulting from attempts to extract it using foreign-body forceps

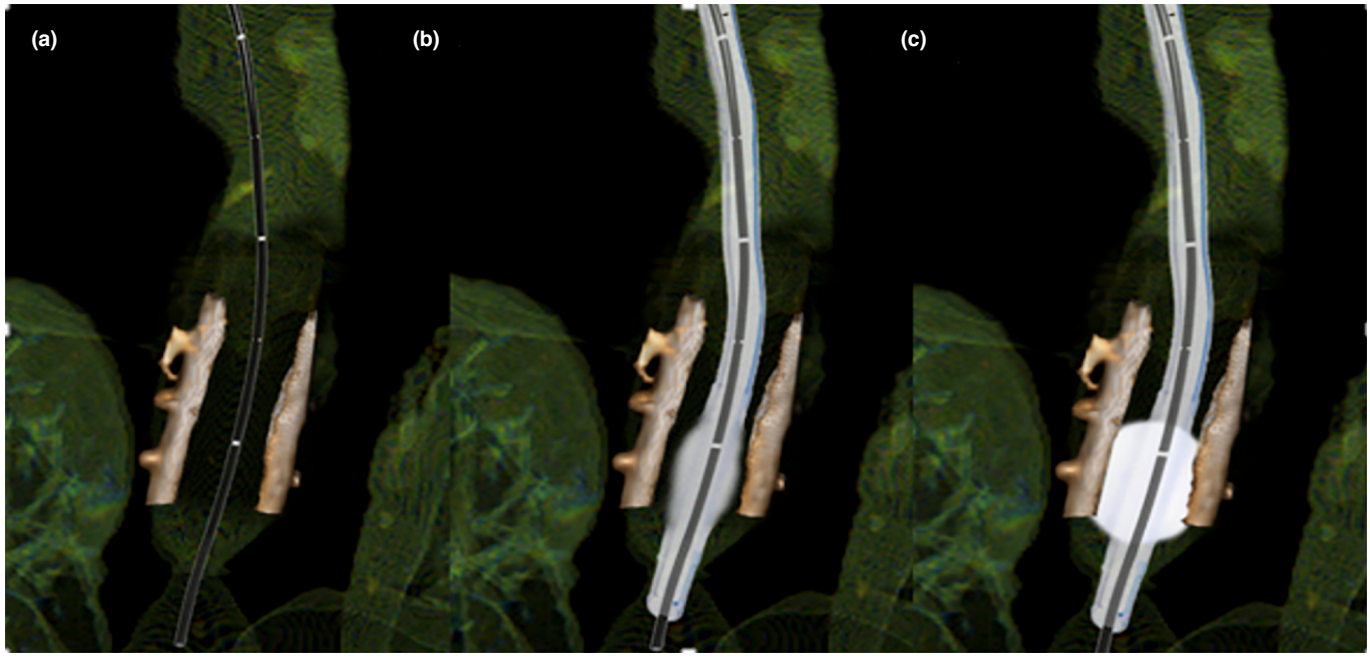

Figure 2: Demonstration of the procedure using the patient's computed tomography images. (a) Evaluation of the airway and the stent using a flexible bronchoscope. (b) Placement of a 6-mm–diameter endotracheal tube into the stent under guidance of a thin bronchoscope. (c) En bloc removal of the stent together with the endotracheal tube after cuff inflation under thin bronchoscope guidance

worsening symptoms attributed to granulation tissue formation distal to the stent. To address this, balloon dilation and cryotherapy were performed, resulting in improved airway patency. Removal of a silicone stent without rigid bronchoscopy can be challenging, and the literature describing alternative removal techniques is sparse. In certain cases, flexible bronchoscopy using forceps (e.g., foreign body or alligator forceps) may facilitate removal; however, long-standing stents present additional difficulties, including tearing, inadequate grasp, and insufficient removal force. Endotracheal tube cuff–assisted extraction may offer a practical alternative when rigid bronchoscopy is not feasible. Nevertheless, potential risks include mucosal trauma, bleeding, distal migration of the stent, hypoxemia, and laryngeal injury. In our case, the procedure was performed under continuous bronchoscopic visualization with close anesthetic monitoring. The cuff was gradually inflated under direct visualization to ensure secure engagement of the stent while minimizing injury to the airway wall. A multidisciplinary team was present, and surgical backup was available in case of airway compromise or procedural failure.

Our case highlights a novel approach in which we successfully removed the stent using an endotracheal tube cuff. This method involves ensuring that the endotracheal cuff securely grasps the stent so that both the stent and the cuff can be carefully removed together. To our knowledge, this technique has not been previously described in the literature. This approach enabled us to avoid a high-risk surgical procedure for the patient. [6] Follow-up revealed no complications, and no further progression of narrowing due to granulation tissue distal to the stent was observed, underscoring the efficacy and safety of this innovative removal method.

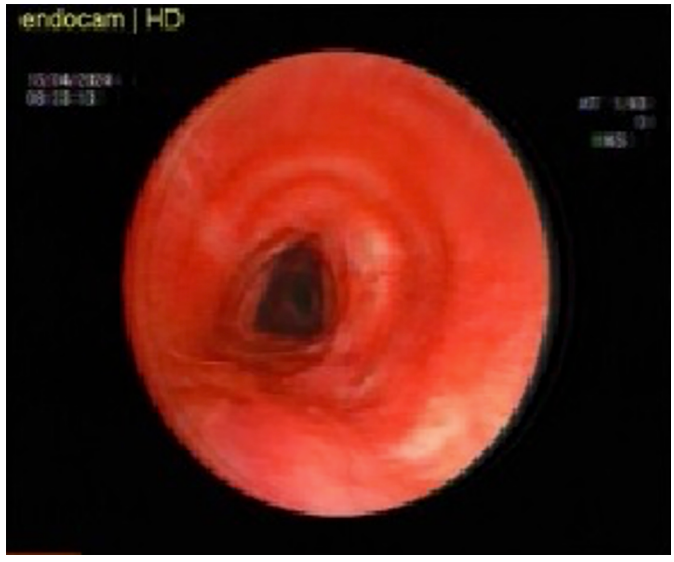

Figure 3: Bronchoscopic appearance of the airway one month after stent removal

Ethics Committee Approval

This is a single case report, and therefore ethics committee approval was not required in accordance with institutional policies.

Informed Consent

Written informed consent was obtained from the patient for the procedure and for publication of this case report.

Conflict of Interest

The authors have no conflicts of interest to declare.

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Use of AI for Writing Assistance

No use of AI-assisted technologies was declared by the authors.

Author Contributions

Concept – Ö.A., C.Ö., L.D.; Design – Ö.A., C.Ö., L.D.; Supervision – Ö.A., C.Ö., L.D.; Resource – Ö.A., C.Ö., L.D.; Materials – Ö.A., L.D.; Data Collection and/or Processing - Ö.A., C.Ö., L.D.; Analysis and/or Interpretation - Ö.A., C.Ö., L.D.; Literature Review – Ö.A., C.Ö., L.D.; Writing – Ö.A., C.Ö.; Critical Review – Ö.A., C.Ö.

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References

1. de Castro G, Iribarren M, Rivo E, Meléndez R, Nóvoa E, Cañizares M, et al. Tracheoesophageal fistula in an intubated patient. Treatment through exclusion and esophageal patch. Cir Esp2005;77(4):230–2. Spanish. [CrossRef]
2. Hasan L, Sharma B, Goldenberg SA. Acquired Tracheoesophageal Fistulas: A Case Report and Review of Diagnostic and Management Challenges. Cureus 2022;14(3):e23324. [CrossRef]
3. Tazi-Mezalek R, Musani AI, Laroumagne S, Astoul PJ, D'Journo XB, Thomas PA, et al. Airway stenting in the management of iatrogenic tracheal injuries: 10-Year experience. Respirology 2016;21(8):1452–8. [CrossRef]
4. Chaddha U, Agrawal A, Kurman J, Ortiz-Comino R, Dutau H, Freitag L, et al. World Association for Bronchology and Interventional Pulmonology (WABIP) guidelines on airway stenting for malignant central airway obstruction. Respirology 2024;29(7):563–73. [CrossRef]
5. Verma A, Um SW, Koh WJ, Suh GY, Chung MP, Kwon OJ, et al. Long-term tolerance of airway silicone stent in patients with post-tuberculosis tracheobronchial stenosis. ASAIO J 2012;58(5):530–4. [CrossRef]
6. Karpitski A, Shestiuk A, Panko S, Zhurbenka H, Vakulich D, Ihnatsiuk A. Thoracoscopic treatment of iatrogenic injuries of the tracheobronchial tree: a retrospective analysis of 5 cases and review of the literature. Wideochir Inne Tech Maloinwazyjne 2022;17(1):240–4. [CrossRef]