How-to-do-it

Use of microdebrider in glottic stenosis following airway stenting

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Received 28 February 2006; received in revised form 23 April 2006; accepted 26 April 2006

Abstract

Stent placement may induce granulation tissue, occlude the stent lumen, and exacerbate respiratory symptoms. Microdebrider was designed to treat laryngeal papillomas and airway stenosis. However, little research exists on the management of airway stenosis following airway stenting with microdebrider. This study describes two cases of glottic stenosis caused by airway stenting successfully treated with microdebrider.

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Keywords: Microdebrider; Glottic stenosis; Airway stenting

1. Introduction

Microdebrider (Xomed, Jacksonville, FL, USA) is effective in removing obstructing lesions and relief of symptoms. This device comprises a hollow metal tube, rotating blade, and suction tube. The mechanism involved suction, cutting, and debriding of the remaining tissues. The microdebrider achieved excellent treatment outcomes in arthroscopic surgery, laryngeal surgery, and sinus surgery [1—3]. This study describes the use of microdebrider in glottic stenosis resulting from airway stenting.

2. Patients and methods

2.1. Patient 1

A 53-year-old male, who had received Montgomery T tube for post-intubation stenosis three months previously, referred to our clinic with difficulty in breathing and phonation. Bronchoscopy revealed that the T-stent was located at the level of the true vocal cord, with granulation tissue causing 90% luminal obstruction. The finding suggested the diagnosis of vocal cord granulation resulting from stent irritation. Rigid bronchoscopy was performed to reduce vocal cord irritation by shortening the proximal limb of the T tube and test for airway patency improvement. Two days later, the respiratory symptoms worsened, and further surgery was performed on the glottic stenosis. The procedure was performed using suspension laryngoscope. After removing the T tube, considerable proliferation of granulation tissue was found around the edge of vocal cord with severe luminal occlusion. Additionally, another tracheal stenosis was found 3 cm below the tracheal stoma. The granulation tissue was removed using a microdebrider (diameter 4 mm; length, 27.5 cm; 1200 rpm). A size 12 Montgomery safe T tube was inserted to maintain patent airway, with the upper limb placed 1 cm below the vocal cords. Bronchoscopy was conducted to confirm the stent location. The patient was discharged five days postoperatively with stable respiratory status and satisfactory phonation. The T tube was removed uneventfully 12 months following surgery. The patient remained well at 18-month follow-up with no recurrence (Fig. 1).

2.2. Patient 2

A 38-year-old male with a history of traumatic ICH was referred to our department with respiratory distress four months following intubation. Bronchoscopy and computed tomography revealed an airway stenosis at the lower trachea, located 2 cm above the carina with 90% luminal obstruction. Rigid bronchoscopy was then performed under general anesthesia. The stenosis was dilated and a stent was inserted using the rigid bronchoscopic technique. The airway lumen was patent with no evidence of stenosis and patient was weaned from the ventilator two days later. The patient...
Fig. 1. (A) CXR revealed T-stent at the level of the true vocal cord. (B) Bronchoscopy revealed granulation and glottic stenosis. (C) The stenosis was relieved following removal of granulation using microdebrider. (D) Patent glottic lumen at 18 months following surgery.

Fig. 2. (A–C) CT and bronchoscopy revealed vocal granuloma and a silicone stent immediately below the vocal cord. (D) Patent glottic lumen at 19 months following surgery.
was discharged home eight days following surgery. The patient developed respiratory distress and bronchoscopy indicated stent migration 18 months following surgery. A rigid bronchoscope identified a large vocal cord granuloma with 90% airway obstruction, and a silicone stent was identified immediately below the vocal cord. Following stent removal, the granuloma was ablated using microdebrider through the suspended laryngoscope. The patient was extubated smoothly the day following surgery. At 19 months follow-up, the patient showed good respiratory status and acceptable phonation (Fig. 2).

3. Discussion

Airway stent is well known to occasionally cause granulation tissue formation. The mechanisms of granulation tissue formation include bacterial infections, inflammatory reaction, and foreign body irritation [4]. In the current case, granulation formation resulted from malplacement and migration of the silicone stent to the glottic region.

Management of granulation tissue, including electrosurgical resection, cryosurgery, laser ablation, cold-knife excision and dealing with vocal cord granulation presents challenges to physicians. Most studies have reported good results applying laser surgery to vocal cord granulation. However, other studies have indicated that cold-knife surgery has the benefit of protecting normal vocal cord tissue from thermal injury [5—7].

Microdebrider has been demonstrated to be effective in complex lesions. For patients with airway stenosis, microdebrider has achieved enormous success in granulation stenosis, laryngeal papillomas, and endobronchial tumor [1—3,8]. In the present patients, the microdebrider has proven effective and efficacious when applied to treating glottic stenosis and have extended the utility of microdebrider for glottic stenosis following airway stenting.

The advantage of the microdebrider is that it provides a safe, accurate therapeutic approach and minimizes trauma to the vocal cord mucosa. As in the present patient, use of laser ablation is associated with complications such as thermal injury, scar formation, and airway restenosis. Meanwhile, cold-knife surgery requires meticulous surgical technique and a high standard of surgical training.

To summarize, delicate surgical technique is required for managing glottic stenosis owing to stent irritation. Microdebrider offers an effective and convenient treatment option.

References