ABSTRACT

Objectives: Analyze the use and outcomes of Montgomery cannulas for airway management and identify indications for Montgomery cannula placement.

Methods: Patients who had a Montgomery cannula inserted at any point in time from 2003-2012 were retrospectively reviewed. Patient variables and outcomes analyzed included: BMI, medical co-morbidities, indications for a Montgomery cannula, recorded reasons for cannula failure, and complications.

Results: Indications for Montgomery cannula placement included: gliotic stenosis (n=7), obstructive sleep apnea (n=4), bilateral vocal cord paralysis (n=4), subglottic stenosis (n=4), supraglottic swelling after radiation (n=4), supraglottic swelling after tracheostomy (n=4), supraglottic swelling after radiation and GERD (n=1), vocal cord fixation secondary to arthritis and GERD (n=1), and seizure disorder associated with airway obstruction (n=1). 75% of patients (n=15/20) had successful use of a Montgomery cannula. 25% (n=5/20) required replacement with a Jackson tracheostomy tube due to persistent tracheostomal granulation tissue (n=2), patient sense of greater safety with the Jackson tracheostomy tube (n=1), a posterior scar band causing airway obstruction not adequately bypassed by the cannula (n=1), and inability to care for the cannula secondary to manual dexterity issues from rheumatoid arthritis (n=1). The Montgomery cannula was utilized as a successful decannulation tool in four patients.

Conclusion: This is the first reported series to analyze use of the Montgomery cannula as an airway management tool for indications other than obstructive sleep apnea. We identify features associated with successful use of the cannula and an additional indication for a Montgomery cannula as a step down management tool for decannulation.

INTRODUCTION

The silicone tracheal cannula, also known as a Montgomery cannula, was first introduced in 1978. It is comprised of an inner flange shaped to fit against the anterior tracheal wall and an outer shaft with circumferential ridges that secure a face plate or ring washer in place against the anterior cervical skin (Figure 1). The standard maintenance tracheostomy tube employed at our institution for long term use in adult patients who do not require positive pressure ventilation is the Jackson metal non-fenestrated tracheostomy tube, ranging in size from #4 to #8. Advantages to the Montgomery cannula favoring its use over this standard tracheostomy tube include: the lack of an intraluminal projection into the airway, its lower profile and, in most cases, improved ease of care (Figure 2). Indications for Montgomery cannula placement as first described by Montgomery included sleep apnea, bilateral vocal cord paralysis, laryngeal carcinoma with gliotic insufficiency during radiotherapy, chronic lung disease requiring suctioning, and intermittent laryngeal insufficiency. To our knowledge, there are no publications to date that have evaluated Montgomery cannula use in other patient populations besides obstructive sleep apnea (OSA).

RESULTS

Twenty patients received a Montgomery cannula from 2003-2012 at the University of Iowa Department of Otolaryngology. 75% of patients (n=15/20) had successful use of a Montgomery cannula. 25% (n=5/20) required replacement with a Jackson tracheostomy. Four patients used the Montgomery cannula as a step down management tool for decannulation.

Indications for Montgomery cannula placement included: gliotic stenosis (n=7), obstructive sleep apnea (n=5), bilateral vocal cord paralysis (n=4), subglottic stenosis (n=4), supraglottic swelling after radiation (n=4), supraglottic swelling after tracheostomy (n=4), supraglottic swelling after radiation and GERD (n=1), vocal cord fixation secondary to arthritis and GERD (n=1), and seizure disorder associated with airway obstruction during seizure activity (n=1). Five patients had multiple indications for Montgomery cannula placement.

Patients with subglottic stenosis or obstructive sleep apnea were more likely to have failure of their Montgomery cannula compared to other indications. Two patients with subglottic stenosis (n=2/4) and three patients with obstructive sleep apnea (n=3/5) required replacement of the Montgomery cannula with a Jackson tracheostomy (Figure 3).

Granulation tissue contributed to two patients who had their cannulas removed permanently and two patients who had the cannula removed intermittently (Table 1).

Obese patients who underwent a four-flap epithelial lined tracheostomy were more likely to have success with the Montgomery cannula than obese patients who received standard tracheostomy (Figure 5).

CONCLUSIONS

This is the first study of its kind to analyze the use of Montgomery cannulas for airway management in a variety of indications. This favorable experience supports our enthusiasm for use of this device in motivated patients with favorable anatomy who are not 100% tracheotomy dependent. We also identified an additional indication for a Montgomery cannula as a step down management tool for decannulation. Granulation tissue may limit cannula use — further stressing the importance of careful selection of patients who have the ability to care for the cannula. Further evaluation of indications and success with Montgomery Cannula in a larger patient population will help to continue to refine its use in the management of airway obstruction.

REFERENCES