ABSTRACT

Objective: To report experience with endoscopic high-pressure balloon dilation (HPBD) of the pediatric airway, validate its use based on existing guidelines for airway dilation, describe possible novel applications, as well as limitations and complications.

Methods: We reviewed the charts of all patients who had HPBD at our institution between 2008 and 2014. Recorded data included demographics, diagnosis with stenosis grade and length, comorbidities, indications, balloon size and pressure, number of dilations, dilation outcomes, adjunctive medications and complications.

Results: 34 children had HPBD for airway stenosis. 52% were female. The mean age was 5 years old (STD 5.9). 32 (94%) had two or more comorbidities including pulmonary HTN and heart failure. The mean number of procedures was 2.8 (STD 2.1). Twenty-three (67%) children had HPBD for airway stenosis in an effort to avoid tracheotomy or laryngotracheal reconstruction (LTR). The success rate was 86%. The average number of procedures was 2.8 (STD 2.1). Six (18%) children had HPBD in order to expand the lumen in high grade stenoses prior to LTR and 67% of these children were successfully decannululated following LTR, with a mean of 3.6 (STD 1.2) procedures. Four (12%) children had HPBD following slide tracheoplasty for distal tracheal stenosis, and 33% of these patients avoided tracheostomy, with a mean of 2.3 (STD 1.5) procedures.

Conclusions: HPBD appears to be equally safe and effective to more traditional methods of airway dilation, although a significantly more expensive one. Indications for HPBD appear consistent with existing guidelines for other dilation methods.

METHODS

With the approval of Lucille Packard Children’s Hospital’s institutional review board, we reviewed the charts of all patients who had HPBD at our institution between 2008 and 2014. Recorded data included demographics, diagnosis with stenosis grade and length, co-morbidities, indications, balloon size and pressure, number of dilations, dilation outcomes, adjunctive medications, duration of follow-up and complications.

REFERENCES


(Other references)

DISCUSSION

The indications for HPBD appear to be identical to that of rigid airway dilation. In particular, HPBD shows promise for:

1. The prevention of acute stenoses progressing to chronic stenoses (Figure 2)
2. Optimization of the airway caliber in anticipation of LTR (Figure 3)
3. Facilitation of extubation (Figure 4)
4. Expansion of the airway in the setting of multiple co-morbidities forbidding more invasive procedures (Figure 5)

These devices should be used with great caution since their expansive power does have risk of laryngeal fracture and tracheal rupture when the size and clinical findings of the airway are not carefully considered (Figure 6).

CONCLUSIONS

HPBD appears to be equally safe and effective to more traditional methods of airway dilation, although a significantly more expensive one. Indications for HPBD appear consistent with existing guidelines for other dilation methods.