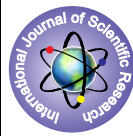


Role of Balloon dilatation in case of Tracheal stenosis



Medical Science

KEYWORDS :

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ABSTRACT

AIM & OBJECTIVE: The aim of the present study & evaluate role of Balloon dilatation in case of tracheal stenosis of various aetiology.

Method: 15 patients with tracheal stenosis participated in the study. Most common aetiology included was post intubation tracheal stenosis. All the patients who were operated at Civil Hospital, Ahmedabad were in the age range of 1 to 18 years. Retrospective as well as longitudinal study was carried out. Patients were followed up at 1,2, 6, 12 and 24 months of interval.

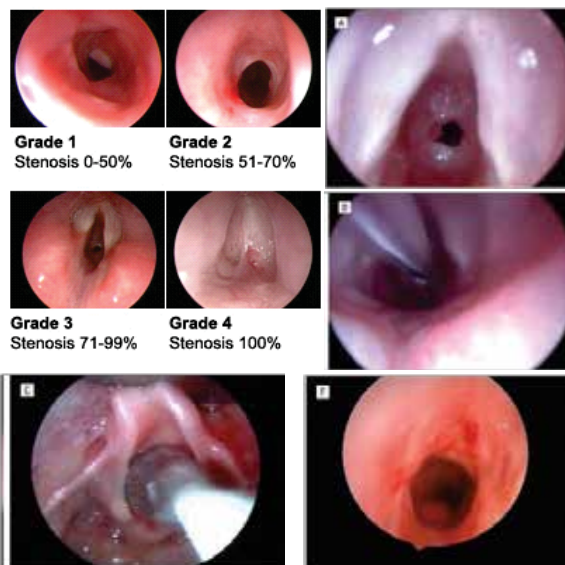
RESULTS: A case series of 15 patients with acquired tracheal stenosis reported that 60% (9/15) had resolution of symptoms after the first or second balloon dilatation. 5 patients (33%) having less advantage in resolution of symptoms. These patients required laser ablation with balloon dilatation, and 1 patient had to undergo tracheal stenting after laser ablation and balloon dilatation having recurrence of symptoms at mean follow up of 1 to 6 months.

CONCLUSION: The use of balloon dilatation technique in tracheal stenosis patients offers a good treatment modality with low incidents of restenosis and ease of procedure.

INTRODUCTION

Tracheal stenosis is narrowing of the airway that can be congenital, traumatic or mostcommonly iatrogenic after prolonged endotrachealintubation. The condition is common in pediatric age group. Symptoms include hoarseness, stridor, exercise intolerance andrespiratory distress. Prevalence of tracheal stenosis is 30% after tracheostomy tubeplacement and1%after lowpressure cuff endotracheal tube.The aim of endoscopic balloon dilatation is to dilate airway strictures withminimal mucosal traumaby applying pressure to an area of stenosis.Severity of tracheal stenosis can be assessed by the cross sectional areas shown in the diagram.

Subglottic or tracheal stenosis is a narrowing of the windpipe between the throat and the lungs, which can cause wheezing, hoarseness and shortness of breath. It most commonly occurs after a person has needed to use a ventilator (breathing machine) and has had a tube down their windpipe for some time. In this procedure, a small balloon is introduced into the narrowed windpipe through an endoscope (a flexible telescope), which is inserted down the throat. The balloon is then gently inflated to widen the narrowed windpipe.



Determined by differing-sized endotracheal tubes Four grades of stenosis:

- grade I lesions have less than 50% obstruction
- grade II lesions have 51% to 70% obstruction
- grade III lesions have 71% to 99% obstruction

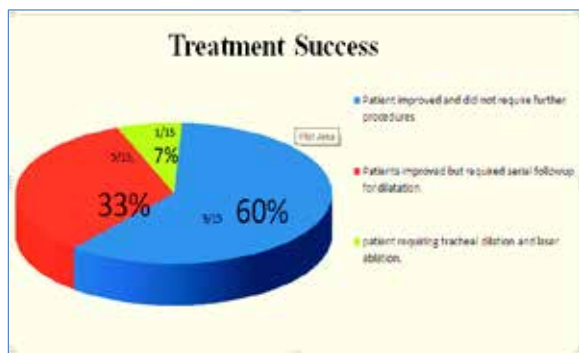
- grade IV lesions have no detectable lumen or complete stenosis

MATERIALS & METHOD

15 patients with tracheal stenosis participated in the study. Most common aetiology included was post intubation tracheal stenosis. All the patients were operated at Civil Hospital, Ahmedabad were in the age range of 1 to 18 years. Retrospective as well as longitudinal study was carried out. Patients were followed up at 1, 2, 6, 12 and 24 months of interval.

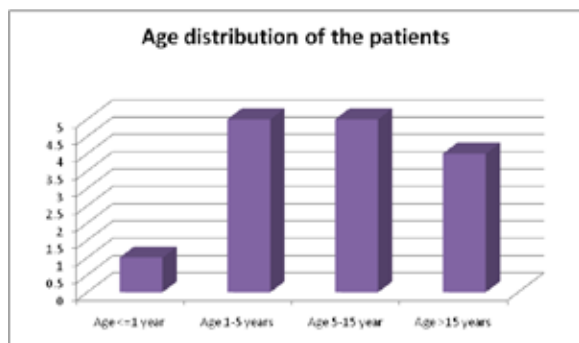
The procedure is usually done under general anesthesia and using direct laryngoscopic or bronchoscopic visualization. A balloon device is introduced into the airway and the balloon is gently inflated, applying radial pressure circumferentially to the stricture for 20 to 45 seconds at 4 atmosphere pressure. After dilatation, the balloon is deflated and the device withdrawn.

DISCUSSION



A case series of 15 patients with acquired tracheal stenosis reported that 60% (9/15) had resolution of symptoms after the first or second balloon dilatation. 5/15(33%) patients having less advantage in resolution of symptoms and they required laser ablation with balloon

dilatation. 1 out of 15 patient had to undergone tracheal stenting after laser ablation and balloon dilatation having recurrence of symptoms at mean follow up of 1 to 6 months.



The pathophysiology of acquired tracheal or bronchial stenosis is not exactly clear. Several necropsy studies have led to the suggestion that in the first hours or days of intubation, the endotracheal tube may initiate a pressure necrosis in the trachea or bronchus, resulting in oedema and ulceration. Trauma from suction catheters may have the same effect. Secondary infection and perichondritis, usually progressing to chondritis and cartilaginous necrosis, cause further damage. A period of healing begins, with epithelial regeneration and complete re-epithelialisation within a few weeks. It is assumed, however, that in some instances it will result in a fibrous stricture. After full thickness necrosis of the tracheal mucosa, collapse of the framework of the larynx may also occur.

The awareness that ventilation is a risk factor in developing acquired tracheal or bronchial stenosis, especially in preterm newborn infants, is the first step in its diagnosis. In the case of localised alternating hypoinflation and hyperinflation, atelectasis, stridor, or apnoea, a stenosis should be suspected. In ventilated (premature) newborn infants, unexplained increases in ventilatory or oxygen requirements or unexplained failure of pulmonary treatment may be a manifestation of a developing obstructive pathology. Whether a rigid or flexible bronchoscope is used to establish the final diagnosis is more or less a matter of preference. In our clinic we prefer a rigid bronchoscope for its better ventilation possibilities, and the possibility of combining it with treatment interventions if necessary. Bronchography is not always required and should be reserved for those patients in whom the distal trachea or the main bronchi cannot be seen, to establish the site and the length of the stenotic segment(s).

CONCLUSION

Balloon dilatation is an effective procedure for stabilizing a patient's airway and managing Tracheal stenosis. Tracheal stenosis although not very uncommon presents a challenging problem to otorhinolaryngologists. Various treatment modalities are available, but balloon dilatation is the recently introduced treatment modality for tracheal stenosis since this was not associated with significant mortality and morbidity. It has proven to be safe and effective.

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