



## ENDOSCOPY ROLE IN ASSESSMENT AND DIAGNOSIS OF PAEDIATRIC STRIDOR – A SERIES OF 515 CASES

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**ABSTRACT** Aim: The role of endoscopy (Direct laryngoscopy/Video laryngoscopy, Flexible /rigid bronchoscopy) in analyzing and establishing diagnosis of stridor in paediatric population Study design- A Retrospective study of 515 cases, between March 2013-March 2014 , done at our ENT department below 12 years of age presenting with respiratory distress to the Emergency department/ ENT department. Result: Out of 515 cases, in 482 cases diagnosis for stridor was established while in 2 cases of extra luminal pathology scopy was normal. In 31 cases of medical causes for stridor scopy was not performed. Conclusion: Stridor in paediatric age group is a frequent finding and may reflect a variety of diseases. ENT surgeons and paediatricians should recognize the causes of stridor to treat it precisely. Endoscopy is a safe procedure in experienced hands for diagnosing the causes of stridor in paediatric age group

**KEYWORDS :** Paediatric, Stridor, Endoscopy, Diagnosis

### Introduction

Stridor may be defined as the presence of noisy respiration resulting from the turbulent passage of air through a narrowed airway. Depending on its location stridor may be inspiratory (pharynx or supraglottic), biphasic (glottic or infraglottic) ,or expiratory (trachea or lower airways)(1). Congenital and acquired airway diseases are responsible for upper respiratory distress in children<sup>(2)</sup>.

Stridor is an emergency situation. In tertiary care centres where more complex diseases are seen by the ENT surgeons and Paediatricians, they should analyze and recognize early to establish the severity of stridor and cause of stridor. Endoscopy, when indicated should be detailed and carefully done to diagnose and initiate treatment.

**Aim:** The role of endoscopy (Direct laryngoscopy/Video laryngoscopy, Flexible /rigid bronchoscopy) in analyzing and establishing diagnosis of stridor in paediatric population.

### Inclusion criteria:

1. Age group of newborn up to 12 years
2. History of respiratory distress due to structural anomaly of respiratory tract intra luminal/ extra luminal pathology
3. Patients of acquired pathology of airway causing respiratory distress

### Exclusion criteria

1. Respiratory distress due to medical diseases like asthma, cardiac, haematological causes
2. Post intubation subglottic stenosis were excluded from study

### Materials and methods:

A retrospective study of 515 cases, between March 2013-March 2014, done at Department of ENT, Institute of Child Health, Madras Medical College , Chennai in paediatric age group patients, below 12 years of age presenting with respiratory distress to the Emergency department/ ENT department.

The primary management was to maintain the airway in all cases by intubation if respiratory distress is severe, intravenous line established, intravenous fluid /antibiotics / steroids / racemic adrenaline, followed by history of the respiratory distress from the parents/ caretakers. Then according to the provisional diagnosis evaluation is done with X-ray neck AP/ Lateral with chest / Computerised Tomography / Magnetic Resonance Imaging. The various scopy performed are direct laryngoscopy/ flexible bronchoscopy/rigid bronchoscopy/ oesophagoscopy. Tracheostomy was performed in few cases to bypass airway obstruction. Definitive treatment was instituted according to

the diagnosis.

### Observations:

**Table 1 Less than one year**

Diagnosis	No of Cases
Laryngomalacia	348
Choanal atresia	5
Subglottic web	2
Cystic hygroma	2
Cyst floor of tongue	1
Cellulitis neck	1
Trachea oesophageal fistula	1
Pierre- Robin Syndrome	1
Total	361

**Table 2**

**One year to 12 years**

Causes	No of Cases
Foreign body Bronchus	122
Recurrent laryngeal papillomatosis	7
Laryngo-tracheo bronchitis	7
Acute epiglottitis	2
B/L Vocal cord palsy	2
Retropharyngeal abscess	2
Foreign body cricopharynx	2
Subglottic haemangioma	1
Diphtheria	1
Epiglottic cyst	1
Innominate vessel compression	1
Pseudo-aneurysm arch of aorta	1
Total	154

**Table 3**

**EndoScopy**

Scopy	No of cases
Direct Laryngoscopy	349
Video laryngoscopy	10

Flexible bronchoscopy	49
Rigid bronchoscopy	122
No scopy performed	21



Fig 1 (Laryngomalacia)



Fig 2 (Laryngeal Papillomatosis)



Fig 3(Sub glottic Haemangioma)



Fig 4 (Subglottic stenosis)



Fig 5 (Cellulitis floor of mouth)



X rays  
Fig 5(Retropharyngeal Abscess)



Fig 6 (Right lung hyper inflation)



Fig 7 (Right lung collapse) FB  
Right Bronchus

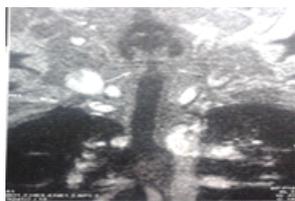


Fig 8 (Right brachiocephalic artery



Fig 9 (Pseudo Aneurysm arch  
of aorta)

**Discussion**

The first report of foreign body removal with a rigid bronchoscope as published in 1897, and Chevalier Jackson in 1936 reported the first successful removal of bronchial foreign bodies with new bronchoscopic system (3,4). The flexible fiberoptic bronchoscope was developed in 1968 by Ikeda and the initial reports of foreign body removal with flexible bronchoscope was published in 1970s(5,6).

In neonates and children less than 1 year of age, congenital airway anomaly is the most common cause of stridor, of which laryngomalacia is the main cause similar to study(7,8,9) (Fig 1). The other causes are listed in (Table 1). In children above 1 year Foreign body airway was the most common cause (Table 2)(Fig 6,7). In our study direct laryngoscopy was done in 348 cases allowing a more detailed

assessment of supraglottic region and vocal cord movements. In elder children video laryngoscopy under topical local anaesthesia was done as a diagnostic procedure for 10 cases (Table 3).

In suspecting lower airway pathology, or when stridor not controlled with medical management, flexible bronchoscopy under local anaesthesia was done in 49 cases. Rigid bronchoscopy was done as a therapeutic measure for removing foreign bodies in 43 cases diagnosed by flexible bronchoscopy and directly in 77 cases, when there is definitive history of foreign body aspiration or history suspicious history of foreign body aspiration (Table 3). The cases diagnosed after flexible bronchoscopy were proceeded for foreign body removal immediately. Rigid bronchoscopy was done under general anaesthesia, with induction by propofol, relaxation and apnoea with scoline, oxygenation with jet ventilation thus similar to the studies that flexible/ Rigid bronchoscopy is required for diagnosis of foreign body airway (10).

Scopy was not performed in 21 cases which was diagnosed on the basis of imaging. There were 2 cases in which the scopy was normal and when advanced imaging (CT scan, MRI angiogram) was done it was found that the cause of distress was due to extraluminal compression (Fig 8,9). Thus the extraluminal compression should be considered in cases where the scopy is normal in cases of respiratory distress.

**Conclusion**

Stridor in pediatric age group is a frequent finding, and may reflect a variety of diseases. ENT surgeons and pediatricians should recognize the main causes of stridor and carefully analyze each case to treat precisely. Thus direct laryngoscopy/ video laryngoscopy is best for diagnosing supraglottic / glottic pathology in neonates and children, flexible bronchoscopy for diagnosing lower airway anomalies, while rigid bronchoscopy for foreign body retrieval. Thus endoscopy is a safe procedure in experienced hands for diagnosing the causes of stridor in pediatric age group.

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