SHORT COMMUNICATION

Endoscopic Laser for Severe Laryngomalacia

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Stridor in the pediatric age group needs detailed evaluation. Laryngomalacia, the commonest cause of stridor is mostly benign, but in about 10% patients can be an important cause of morbidity and mortality. Laser surgical correction in patients with severe laryngomalacia gives good results. We evaluated 32 patients of stridor. All were screened with fibreoptic laryngoscopy and whenever indicated, direct endoscopy was carried out. 13 (40%) of the patients had laryngomalacia. Of these, 8 had severe laryngomalacia and underwent treatment with diode laser. All of them showed definite post procedure improvement.

Keywords: *Endoscopy, Laryngomalacia, Laser, Stridor.*

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Stridor is a symptom that should be thoroughly evaluated. Persistent stridor is generally due to anatomical abnormalities of airway, the commonest cause being laryngomalacia(1-3). Almost 90% patients with laryngomalacia can be managed by periodic observation only and 10% with severe condition require hospitalization, intense monitoring and maybe, a surgical intervention. Gastroesophageal reflux should always be ruled out(4). We conducted this study to assess the usefulness of fibreoptic laryngoscopy and direct endoscopy in evaluation of stridor, and efficacy of laser surgical correction in children with severe laryngomalacia.

METHODS

We retrospectively analyzed 32 pediatric cases of persistent stridor referred to our institute for further evaluation, diagnosis and management over a period of two years between August 2005 to August 2007. After a thorough history, all children were examined with a fibreoptic laryngoscope (Fusinon flexible nasopharyngoscope) in the outpatient clinic.

Patients with severe stridor were admitted. Proper hydration, oxygenation and supportive care was provided. Nebulization was carried out with adrenaline (5mL of 1:1000) and budenoside (2mg) in all. Systemic steroids (dexamethasone 0.15 mg/kg 8 hrly for three days) and bronchodilators (terbutaline 0.01 mg/kg s/c) were administered in patients with severe stridor. ABG was done in all children at admission and repeated only if initial ABG was abnormal. CT neck was done in 25/32 patients of patients to look for accompanying anomalies/ extraluminal cause of stridor. Direct laryngoscopy with 30º sinus endoscope (Storz endoscope) under anesthesia without any muscle relaxant was carried out in all. Subglottis and tracheal lumen were examined after giving 10% xylocaine spray over the vocal cords. Children with laryngomalacia were classified as mild, moderate, and severe as per the classification of European Laryngological Society(5).

Patients with severe laryngomalacia underwent surgical diode laser. Neonates were electively ventilated for 24-48 hrs post procedure, and monitored in an ICU setting. Nebulisation with adrenaline and budesonide was continued in all. Parenteral dexamethasone (0.15 mg/kg 8 hrly) for three days was also given. All patients were administered antireflux medication post surgery for three months. Once stable, patients were discharged

and called for follow-up after a week. Subsequently monthly follow-up was advised for next six months. Patients were also advised to report in case of any stridor, respiratory distress, feeding difficulty and noisy breathing.

RESULTS

Laryngomalacia was ascertained as the most common cause of stridor, seen in 13 cases (40%). The other causes included subglottic stenosis (9/32), bilateral vocal cord palsy (5/32), laryngeal web (4/32), and interarytenoid cleft (1/32).***Table* I** provides the details of 13 cases with Laryngomalacia.

Improvement was seen in all within 24 hrs and at discharge three to four days post surgery. Follow up done for a maximum of two years showed improvement in terms of feeding, weight gain and did not show any complications in terms of airway compromise even during future episodes of respiratory tract infection.

DISCUSSION

Awake flexible fibre-optic laryngoscopy is used as a screening procedure to examine the interior of the aerodigestive tract. It gives the definitive diagnosis of the cause of stridor in most patients(6-8). If in doubt, imaging studies are done. Direct laryngoscopy under a general anesthetic is the gold standard investigation that is required in a few patients to confirm initial findings and rule out lesions elsewhere in the respiratory tract.

Conventional treatment of the laryngomalacia with tracheostomy carries significant risk of morbidity and mortality(9). Endoscopic laser correction provides immediate improvement, avoids the need for tracheostomy and improves the quality of life(9). Many studies have found fibreoptic laryngoscopy to be safe and cost effective method as screening procedure in stridor evaluation, and have recommended the endoscopic evaluation for a group of patients in whom a diagnosis cannot be made in

TABLE I DATA OF PATIENTS WITH LARYNGOMALACIA

S.No	Age at Presentation	Age at onset	Sex	Severity	Treatment	Follow-up duration	Condition at last follow – up
1	1½ yr	2 m	M	severe	diode laser	6 m	weight gain good, no stridor
2	2½ yr	1½ yr	F	moderate	medical	on regular follow up	mild stridor during URTIs
3	3yr 2 m	2m	M	severe	diode laser	2yr	doing well, no complaints, good weight gain
4	4 m	birth	M	severe	diode laser	1yr	no feeding problems, mild stridor during URTI
5	5 m	1m	F	severe	diode laser	8 m	doing well
6	2 m	birth	F	severe	diode laser	9 m	good weight gain, feeding problems, no stridor, good weight gain
7	1 d	birth	F	severe	diode laser	8 m	mild stridor during URTI
8	1d	birth	M	severe	diode laser	6 m	weight gain good, no stridor
9	3 wk	birth	M	severe	diode laser	3 m	weight gain good, no stridor
10	2½ m	birth	F	moderate	medical	on regular follow up	mild stridor during URTI
11	1½ m	birth	F	moderate	medical	on regular follow up	mild stridor during URTI
12	2½ m	birth	M	mild	medical	on regular follow up	weight gain good, no stridor
13	5 m	birth	M	moderate	medical	on regular follow up	no feeding problems,no stridor

Laser indicates laser aryepiglottoplasty; Medical management includes nebulisation and steroids; wt: weight; URTI: upper respiratory tract infection.

WHAT THIS STUDY ADDS?

- Endoscopic laser surgery in severe laryngomalacia is safe and provides immediate improvement in symptoms.

outpatient clinic(6,8). Earlier studies have reported successful endoscopic correction of severe laryngomalacia(10,11).

Our study had certain limitations. Some cases were referred after tracheostomy was performed. Also patients with central nervous system causes of stridor were not evaluated separately. Better awareness regarding the available treatment options and early referrals for laser endoscopic correction can avoid episodes of severe airway compromise. A larger study for a longer duration is needed in the Indian scenario to further prove the efficacy of laser correction in severe laryngomalacia.

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