

Rigid Endoscopic Examination of Neonatal Larynx in OPD as a Screening Procedure

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ABSTRACT

Objectives/hypothesis: To describe a novel method of examination of neonatal larynx, using a 70° rigid 4 mm fiber optic endoscope in OPD as a screening procedure for evaluation of neonatal stridor/hoarse cry.

Study design: Examination technique and safety profile of a novel method of examination of neonatal larynx in OPD using widely available 70° rigid 4 mm endoscope.

Results: Ten neonates, underwent laryngoscopy as described below, whose age and weight in kilograms were recorded. The pulse rate, O₂ saturation levels and mean arterial pressure were recorded during the procedure to know the effect of the procedure on hemodynamics and respiration of the neonates. Time taken for the procedure for satisfactory view of larynx is also recorded and tabulated.

Conclusion: The novel method of examination of neonatal larynx using 70° 4 mm rigid endoscope in OPD/ward is a safe procedure and gives excellent view/recording of neonatal larynx in its native anatomical and functional status.

Keywords: Neonate, Neonatal laryngoscopy, 70° 4 mm rigid endoscope.

How to cite this article: Pingili HCR, Kumar SR. Rigid Endoscopic Examination of Neonatal Larynx in OPD as a Screening Procedure. *Int J Phonosurg Laryngol* 2012;2(2): 74-76.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

Clinical examination of neonatal larynx is always a challenge, which may require hospitalization and occasionally is done in an operation theater under anesthesia.¹ Direct laryngoscopy under general anesthesia using a laryngoscope is the primary technique for evaluation of laryngeal disease in neonates, in most of the centers. Use of a laryngoscope with its blade in vallecula, which lifts the epiglottis up, distorts the anatomy of the larynx because of which, moments of the vocal cord (spelling corrected) cannot be assessed accurately.² Use of an anesthetic with a muscle relaxant interferes with the function of the larynx and administration of general anesthesia to neonate is always considered a risky procedure. The advantages of awake endoscopic examination compared to examination under general anesthesia include the ability to perform the examination expediently in the office setting with the parents present, without the need for sedation, leading to less

medical expense.³ In this paper, we present our early experience with a novel method of awake endoscopic evaluation of neonatal larynx, which is minimally invasive and provides excellent visualization of neonatal larynx. The procedure is safe enough to be used in clinic/OPD.

MATERIALS AND METHODS

1. 4 mm 70° standard nasal endoscope, camera and a recording facility.
2. Multiparameter monitor capable of recording subject's SPO₂, pulse rate and blood pressure.
3. Intubation kit and drugs for resuscitation in emergency.
4. A neonatal anesthetist as stand by.

Ten neonates who were referred from our new born intensive care unit for evaluation of inspiratory stridor were included in this study. Of them seven were male and three were female neonates. Age of the subjects ranged from 4 to 30 days and their weight ranged from 1.70 to 4.0 kg.

PROCEDURE

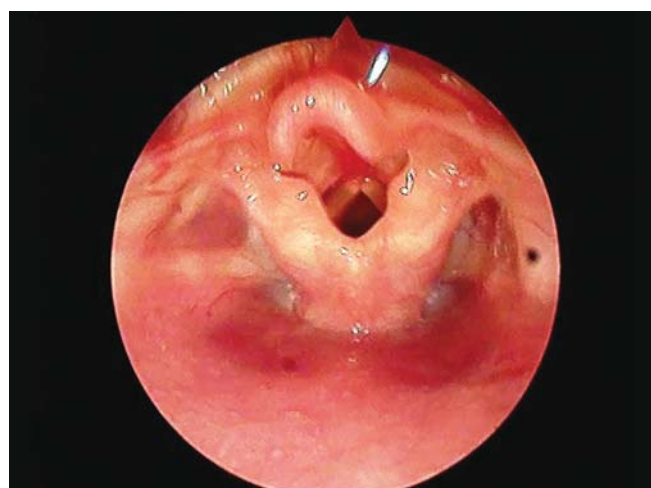
The baby is placed in supine position on the examination table and suitably restrained in a towel. The neonate's mouth is kept open by insinuating examiners left index finger between the jaws of the neonate on left side. The head is restrained by the thumb and rest of the fingers of left hand and slightly extended (Fig. 1).

The endoscope is taken in the right hand of examiner with its bevel facing forward. The tip of the 70° 4 mm rigid endoscope is passed between both jaws and gently advanced over the base of tongue into hypopharynx and is gently maneuvered to visualize the larynx during the gag reflex. No attempt is made to restrict the tongue movements of the neonate, with the left index finger of examiner which is in between the gums of the neonate. No attempt is made to forcefully visualize the larynx by rigorously moving the endoscope. The examiner shall patiently wait till the neonate gags up to show the larynx (Fig. 2). Excessive secretions in the pharynx during the procedure may be aspirated through a small catheter passed through the nose.

Usually satisfactory visualization of larynx is completed in less than 1 minute. Recording facility is advised so that it can be reviewed again. No surface anesthetic is used which

Table 1: Variation of selected parameters during the procedure in each neonate and time taken for satisfactory visualization of larynx

S. no.	Name of the baby	Sex	Age in days	Weight in kg	Pre VLS SPO ₂	Post VLS SPO ₂	Pre VLS pulse	Post VLS pulse	Pre VLS MAP	Post VLS MAP	Time taken in sec
1	B/O Mounika	F	04	2.50	88	89	154	149	43	45	36
2	B/O Swapna	M	06	2.70	100	100	164	182	52	47	39
3	B/O Laxmi	M	09	1.70	99	98	117	107	24	36	31
4	B/O Kavitha	M	09	3.00	94	94	107	151	59	91	27
5	B/O Divya	F	13	2.50	91	91	116	108	52	69	34
6	B/O Rajitha	F	21	2.25	93	92	143	127	45	41	33
7	B/O Yakamma	M	27	2.25	99	99	128	130	54	37	29
8	B/O Yakamma	M	27	2.28	99	99	128	113	49	49	43
9	B/O Rajitha	M	28	4.00	100	98	167	166	49	64	46
10	B/O Renuka	M	30	2.00	96	94	128	115	57	72	43

**Fig. 1:** Position of the neonate for laryngoscopy. Note: The finger between both jaws on left side does not restrict tongue movements**Fig. 3:** The neonatal larynx recorded during laryngoscopy done as described in the article**Fig. 2:** Position of the endoscope during the procedure

would suppress the gag reflex. NBM period for 2 hours is advised prior to procedure. SPO₂, pulse rate and mean arterial pressures were noted before and after the procedure. The parameters were tabulated as shown in the Table 1 as

per the age of the neonates in ascending order. Each parameter variation due to procedure was statistically evaluated. Time taken for satisfactory visualization of larynx for each neonate is recorded.

RESULTS

Excellent visualization of larynx was obtained in all neonates. The time taken for satisfactory visualization of the larynx ranged from a minimum of 27 seconds to a maximum of 46 seconds. There is no incidence of regurgitation of food during the procedure. No procedure was abandoned due to any complication. All procedures and postexamination periods were uneventful (Fig. 3).

DISCUSSION

Our early experience with this new technique of endoscopic neonatal laryngoscopy shows that it is a safe and feasible procedure which can be done in a clinic or OPD, as a primary

screening procedure in evaluation of stridor or hoarse cry in a neonate.

The approach is less invasive and less traumatic than other procedures of direct laryngoscopy under general anesthesia with (or) without use of a rigid endoscope. Flexible endoscopes are not widely available, ultra thin neonatal flexible laryngoscopes do not have a suction port. Disadvantages of flexible fibre optic laryngoscopes are that they are high in cost and the instrument is very delicate. Maintenance and sterilization costs are very high.⁴ The 70° endoscope used in this procedure may also be connected to a standard stroboscope which provides additional information, especially in vocal cord paresis.⁴

CONCLUSION

The per oral rigid 70° endoscopic examination of larynx without fixing the tongue in neonates is more satisfactory than other methods of examination, in terms of cost of equipment and safety profile. The examination can be safely

undertaken in OPD as a routine screening procedure for evaluation of neonatal stridor or hoarse cry.

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