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SHORT COMMUNICATION

Per-oral flexible laryngoscopy in awake neonates and infants: the 'pacifier' technique

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Abstract

Background: It is common for ENT specialists to be called to neonatal intensive care units to assess neonates with suspected laryngomalacia. At Addenbrooke's Hospital, Cambridge, UK, it is standard practice to initially try to assess the larynx whilst the patient is awake. This can cause the patient to cry and become irritable, and can induce worry in the parents. A literature search revealed that numerous procedures have been successfully performed on neonates and infants whilst they were being pacified.

Objectives: This paper describes various procedures where pacification has been used effectively. Furthermore, it reports a pacification technique developed for per-oral flexible laryngoscopy in awake neonates and infants.

Key words: Laryngomalacia; Laryngoscopy; Neonatal Intensive Care

Introduction

Flexible laryngoscopy is now an indispensable tool in ENT practice. It has superseded direct and mirror laryngoscopy. This is because it allows the clinician to thoroughly assess the functional anatomy of the larynx in the awake patient, without the need for sedation or anaesthesia.

Whilst this is true in adults, assessment of the paediatric airway still poses a challenge for clinicians. The most common indication for visualisation of the larynx in the neonate is stridor, of which laryngomalacia is the main cause. Per-oral flexible laryngoscopy in the neonate is well documented. This technique has replaced the more traditional method of rigid laryngoscopy under anaesthesia. It has been shown to be a safe and effective procedure; however, in practice it can cause distress to both the patient and parents, which can impede performance of the procedure.

A number of techniques have been reported in the literature that aim to reduce the pain and distress experienced by awake neonates during invasive procedures. We describe a novel pacifier technique for use during flexible laryngoscopy for assessment of the neonatal airway.

Materials and methods

The preparation for this technique is quick and easy. Specifically, a small hole of approximately 5 mm in diameter is cut from the tip of a sterile disposable bottle teat (available in most paediatric wards).

The teat is then gently stroked along the corner of the child's mouth eliciting the 'rooting' reflex, followed by the sucking reflex. This will pacify the patient. Once the flexible laryngoscope is ready, it can slowly be advanced through the hole created at the tip of the teat.

This technique keeps the tip of the laryngoscope central, preventing the neonate from sucking and manipulating the laryngoscope tip with its tongue.

The child usually remains calm, making the experience less distressing for both the patient and their parents if present (Figure 1).

If manipulated gently, the gag reflex may be avoided, provided that the laryngoscope does not make contact with the oropharyngeal wall. Another alternative is to spray some flavoured topical anaesthetic agent such as benzocaine into the bottle teat before putting it in the patient's mouth. The sucking also elicits swallowing and hence prevents accumulation of saliva in the hypopharynx, thereby enabling a better view of the hypopharynx and larynx.

At this point of the procedure, the teat can be withdrawn from the patient's mouth. This usually leads to phonation or crying, which enables a view of vocal fold movement and assessment of the epiglottis (and potential diagnosis of laryngomalacia) (Figure 2).

The use of a video-laryngoscope allows better views (via a high-definition screen), and the recording of the footage enables slow-motion assessment.

Discussion

Assessment of the neonatal airway can be a challenge for the ENT clinician. The patient can cry, and become very restless and distressed. This can cause the parents, who are often present during the procedure, to worry. Hence, the clinician often has to battle between achieving a good view of the larynx and minimising distress.

Currently, if flexible laryngoscopy is not tolerated by an awake neonate or infant, the patient will typically undergo rigid laryngoscopy under general anaesthesia. In such instances, the patient is subjected to a more invasive procedure and anaesthetic risks, causing further distress. This is associated with logistical challenges too, as the patient will need admitting to hospital, an operating theatre will be required, and the appropriate staff team and paediatric anaesthetists will be needed.

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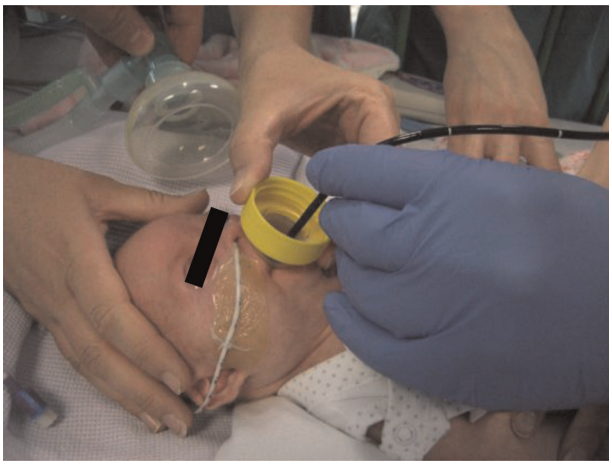

FIG. 1
Photograph taken during flexible laryngoscopy, showing the 'pacifier' in situ.

When a neonate is distressed or crying, the first thing often sought is a pacifier; this response to crying dates back to Neolithic times.[1] Pacifiers tend to soothe and comfort a distressed child.

Non-nutritive sucking has been shown to provide analgesic effects. Other methods of pacification in neonates and infants include the use of oral sucrose solution and topical anaesthetic agents; these have been reported to be effective during minor procedures. Such methods have been described in the context of other medical fields, and have been used during intranasal steroid treatment for haemangiomas and screening for retinopathy of prematurity.[2–4]

A randomised, controlled trial of 150 neonates undergoing venepuncture demonstrated that the use of a pacifier (i.e. a 'dummy') was significantly more effective at reducing pain scores than oral sucrose.[5] In another study, pacifiers were an effective method of delivering pharyngeal anaesthesia during intubation in awake babies with genetic conditions; this was achieved by filling the teat of the pacifier with lidocaine jelly.[6]

This article describes a technique that does not require the administration of prescribed substances, such as local anaesthetic or sucrose solution; hence, the consideration of side-effect profiles is not necessary. The technique takes advantage of the closest method to natural pacification (suckling) as a means to feed the flexible laryngoscope into the patient's larynx.

FIG. 2
Photograph taken during flexible laryngoscopy, showing withdrawal of the 'pacifier' to elicit cry or phonation, thus enabling functional assessment of the larynx.

Several studies have demonstrated the safety and effectiveness of flexible laryngoscopy performed on the awake patient.[7,8] Furthermore, the technique is cost effective as it can be performed in the out-patient setting.[9]

Pacifiers and oral sucrose solution have both previously been associated with transient choking and oxygen desaturation during venepuncture.[2] We argue that the risks of these events are low in flexible laryngoscopy, which is a relatively non-invasive and quick procedure. Furthermore, we propose that the addition of the pacifier to flexible laryngoscopy performed on awake neonates and infants may improve the reliability rate of working diagnoses, which has been quoted by one study as being 80 per cent.[10]

Conclusion

This paper reports a novel technique, whereby flexible laryngoscopy is performed on awake neonates via the use of a pacifier. This technique reduces patient and parent distress, and facilitates performance of the procedure. It is an easy, safe and effective method of examining a functional larynx. The technique eliminates the need for general anaesthetic and can easily be performed in the out-patient setting.

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