Southern African Journal of Anaesthesia and Analgesia 2014; 20(5):218-219
doi: 97962910.1080/22201181.2014.979629

South Afr J Anaesth Analg
ISSN 1608-4356 EISSN 1727-9835

Case Report

Intubation of a neonate with glossopalatine ankylosis using a paraglossal approach and a laryngoscope with a straight blade

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Abstract:

Glossopalatine ankylosis presents a challenge to the anaesthesiologist because of its intraoral attachment which obstructs the view of the oral cavity. When preoperative assessment by direct laryngoscopy is possible, a paraglossal approach using a straight blade can be used in such cases. We share our anaesthesia experience of a neonate with glossopalatine ankylosis.

Keywords: glossopalatine ankylosis, paraglossal straight blade laryngoscopy, glossopalatine bands, direct laryngoscopy, endotracheal intubation

Introduction

Glossopalatine ankylosis is characterised by intraoral bands that attach the tongue to the hard palate or maxillary alveolar ridge. It could be part of the group of oromandibular-limb hypogenesis syndromes that comprise anomalies like a cleft palate, an absent or underdeveloped tongue, mandibular hypoplasia, upper lip hypoplasia, hypodontia and various limb anomalies.[1] The aetiology is unknown and the syndrome appears to be sporadic and rare.[2] We report on the successful anaesthetic management of a neonate with glossopalatine ankylosis using right paraglossal laryngoscopy. Anaesthesiologists are often challenged by difficult intubation due to multiple oral deformities, and having to share the airway with the surgeon.

Case study

A 2.4 kg, seven-day old female infant with glossopalatine ankylosis was admitted to our institution for separation of the ankylotic bands. She was unable to bottle or breastfeed. She did not have a history of prematurity, perinatal asphyxia, pneumonia or hyperbilirubinaemia. The maternal history did not include any drug intake, trauma or illness during pregnancy. None of her siblings had oromandibular defects.

On physical examination, there was oligodactyly of both hands, a small mouth and the drooling of secretions, and the tip of the tongue was attached to the hard palate. Mouth opening was restricted, and the view of the oral cavity obscured by the large fleshy glossopalatine mass. The infant's neck movement was normal. The chest was clear, with normal heart sounds. The neonate did not have micrognathia, mandibular hypoplasia or a small upper lip.

Direct laryngoscopy was performed preoperatively in the operating theatre. The tip of the epiglottis could only be visualised with difficulty. The gloved finger of the anaesthesiologist could be hooked behind the connection between the tongue and the palate. We judged that the bands did not extend beyond the hard palate.

Preoperatively, the neonate was kept in a lateral position with intermittent oral suctioning, and fed through a nasogastric tube. She maintained oxygen saturation in room air.

The plan was to ensure that the neonate could be ventilated by bag and mask, and then to attempt endotracheal intubation with inhalational anaesthetics while she breathed spontaneously. If endotracheal intubation failed, separation of the glossopalatine bands would be attempted with local anaesthetic infiltration.

Written informed parental consent was obtained. The patient was brought into the operating theatre and standard monitors attached. The cart for difficult intubation was kept ready, with adequate-sized oropharyngeal airways, nasopharyngeal airways and a cricothyrotomy set. Anaesthesia was induced with sevoflurane 1% in 100% oxygen. While maintaining spontaneous ventilation, atropine (70 µg) and fentanyl (7.5 µg) were administered intravenously. After ensuring ease of ventilation with the bag and mask, anaesthesia was deepened by 0.5% increments of sevoflurane, up to 6%.

On attaining adequate depth of anaesthesia, direct laryngoscopy was carried out using the paraglossal approach with a size 0 Miller's blade. The tip of the blade was introduced from the right angle of the mouth. The blade was then guided into the groove between the right alveolar margin and the glossopalatine ankylotic band. The glossopalatine band could be pushed slightly to the left with the flange of the blade by applying leftward and anterior pressure. With further advancement of the blade, the epiglottis was identified with great difficulty, and the tip of the blade positioned posteriorly to reveal the anterior end of the glottis. The view improved to some extent with optimal external laryngeal manipulation. A 3.5 mm internal diameter endotracheal tube loaded with a stylet was placed in the trachea. After confirmation of tube placement, it was fixed at the right corner of the mouth and atracurium (1.5 mg) administered intravenously.

Anaesthesia was maintained by intermittent positive pressure ventilation with oxygen, nitrous oxide and sevoflurane (1%). The ankylotic band was clamped and divided. After division of the band, an intraoral pack could be placed and surgery continued.

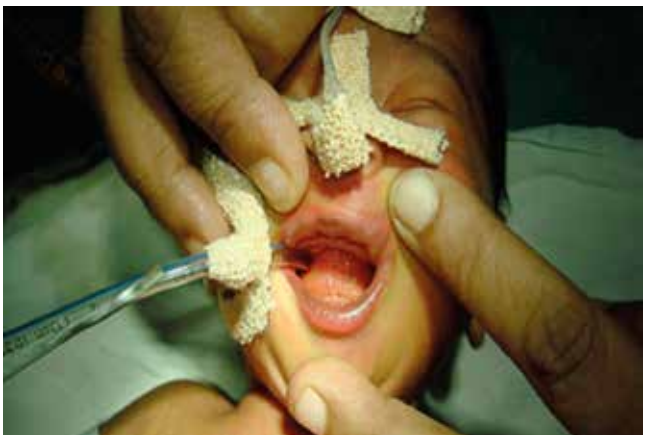

Figure 1: The glossopalatine band after successful intubation of the neonate

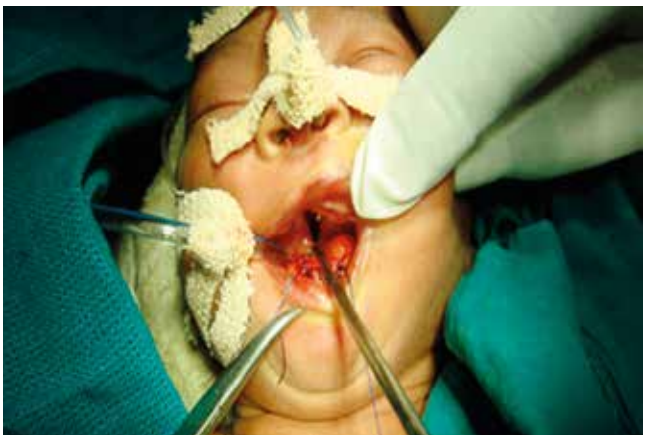

Figure 2: The cleft in the palate after removal of the palatal attachment of the ankylotic band

On removal of the palatal attachment, a cleft in the palate was visualised. At the end of surgery, neuromuscular blockade was reversed and the endotracheal tube removed after the infant had awakened fully. She was shifted to the recovery room and postoperative recovery was uneventful.

Discussion

Glossopalatine ankylosis is characterised by a fibromuscular band of varying thickness arising from the tongue and extending to the hard palate. This mass not only obscures the intraoral view, it also makes indirect laryngoscopy impossible and direct laryngoscopy difficult. The challenge lies in difficult mask ventilation, the introduction of a supraglottic device (in cannot-ventilate, cannot-intubate situations), laryngoscopy and intubation of the neonate, sharing the oral cavity with the surgeon, and inaccessibility of the oral cavity before and during surgery.

Our options were fibre-optic nasal intubation, direct laryngoscopy and oral intubation, or division of the band after injecting local infiltration into the attachment between the band and the palate.

Our team had miminal experience of fibre-optic nasal intubation in neonates. Also, we were unsure of the condition of the nasopharynx. (During the course of surgery, we realised that the palate was clefted and that some of the bands extended into the nasal septum). The chances of bleeding during introduction of the endoscope could not be ruled out, which might have led to complete loss of the airway.

We decided to attempt direct laryngoscopy and orotracheal intubation since the tip of epiglottis could be visualised preoperatively and we believed that the mass was only attached to the hard palate. Batra et al reported on a similar case of glossopalatal ankylosis in a 10-month old boy.[3] They used left molar laryngoscopy with a Macintosh blade for intubation. Henderson recommends paraglossal straight blade laryngoscopy for a difficult intubation.[4] He reported successful intubation with a Miller blade using the paraglossal approach in 10 patients in whom laryngoscopy proved to be difficult when performed using a Macintosh blade. Agrawal et al reported on a series of five cases of successful intubation using the paraglossal technique with a Miller blade after initial failure with a Macintosh blade.[5] The advantages of this technique are that it reduces compression of the soft tissue (i.e. the central component of line of sight) lowers the proximal end of the line of sight, and decreases distal compression of the tongue and posterior displacement of the epiglottis.

Local infiltration would have been resorted to orotracheal intubation had failed. Tanrikulu et al surgically excised the fibrous band in a 10-month old baby with congenital alveolar synechium.[6] They injected a low dose of lignocaine into the regions in which the adhesions were located. Murphy and Rea divided a soft tissue band connecting the upper and lower jaws (restricting the mouth opening) with bipolar diathermy under a brief general anaesthetic using a face mask.[7] Kothari and Gupta reported separation of the fibromuscular bands by cauterisation in a case of ankyloglossia superior.[8] Ogino et al described the resection of a cord-like adhesion band between the hard palate and the floor of the mouth, leading to restricted mouth opening and feeding problems in a one-month-old boy.[9] Since the reports were not taken from anaesthesia journals, anaesthetic management was not mentioned.

In conclusion, paraglossal straight blade laryngoscopy may be useful in securing the airway when traditional dorsal placement and manoeuvring of the curved laryngoscope blade is not possible.

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Received: 08-02-2014 **Accepted:** 22-07-2014