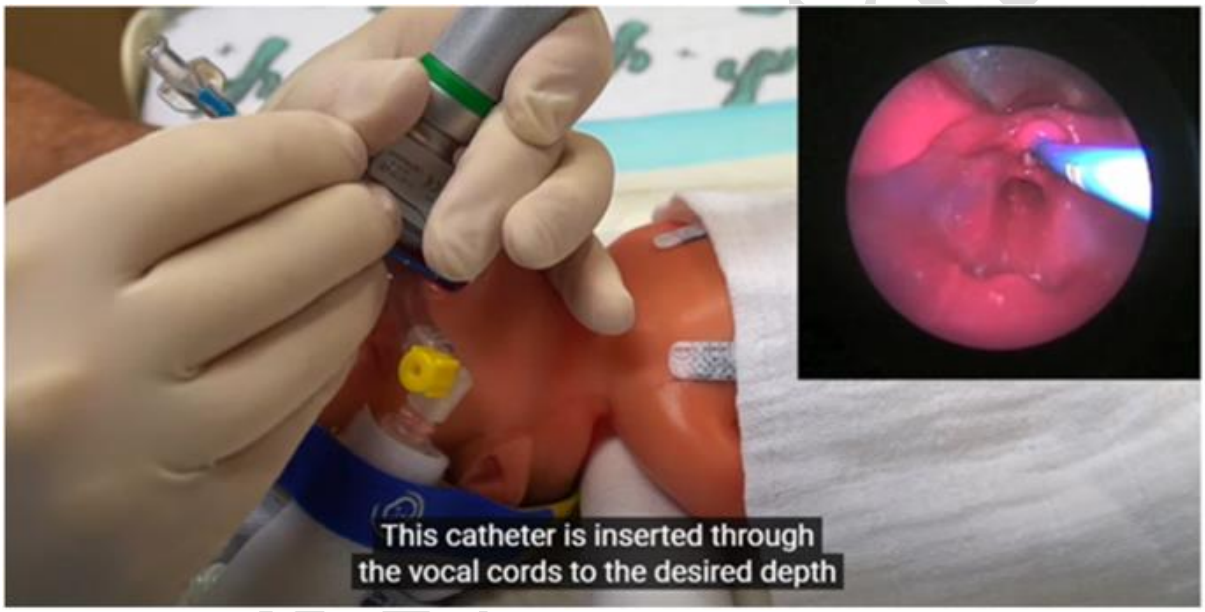
Minimally Invasive Surfactant Therapy (MIST)/ Less Invasive Surfactant Administration (LISA)

SURFCATH



INTRODUCTION

Preterm infants are increasingly being supported with nasal continuous positive airway pressure (nCPAP) at birth and are not routinely intubated, however, many of these infants have significant surfactant deficiency. New techniques of minimally-invasive surfactant therapy (MIST) have been developed, whereby exogenous surfactant can be administered to spontaneously breathing infants on non-invasive respiratory support without the need for intubation.

AIM

To safely administer surfactant to spontaneously breathing infants on non-invasive respiratory support.

EQUIPMENTS

- Oral sucrose
- Laryngoscope handle and blade – Miller 0 or 00
- Vygon surfcath 6 Fr, 0.8 x 2 mm, 200 mm
- Surfactant
- 3ml or 5ml syringe (slip lock)
- Atropine if needed

Preparation

1. Ensure that the infant is suitable for administration of surfactant via MIST. This should always be at the discretion of the neonatologist. In general, MIST should be used in infants that are clinically stable on nCPAP where it is felt that the infant does not require invasive respiratory support but would benefit from surfactant administration.
2. Do not use this technique in an infant that is rapidly deteriorating, haemodynamically unstable or in situations where escalation to invasive ventilation is imminent or likely. MIST should be used with caution in infants who have congenital airway anomalies or other respiratory conditions (eg. pulmonary hypoplasia) contributing to their respiratory status.
3. Ensure three staff members are available to assist (1 x proceduralist; 1 x airway assistant for surfactant administration; 1 x assistant for baby vitals monitoring).
4. Assemble necessary equipment to perform the procedure.
5. Ensure Neopuff circuit with appropriate sized mask is checked and functional if required.

6. Ensure intubation trolley and all necessary equipment required for invasive ventilation is readily available if required.
7. Draw up surfactant (calculated dose) in a 3- or 5-mL syringe. Draw up an additional 0.5 mL of air into the syringe, which allows for the dead space in the instillation catheter (~0.3 mL).

Procedure

1. Continue cardiorespiratory monitoring throughout the procedure.
2. Swaddle the infant and administer oral sucrose. It is optional to also give atropine (10 microg/kg) intravenously at fellow/consultant discretion if any concerns of bradycardia.
3. Position the infant as for a standard intubation procedure.
4. Ensure intragastric tube is secure and aspirate abdominal contents.

Procedurals

1. Perform direct laryngoscopy using a standard laryngoscope blade with nCPAP /HFNC remaining in situ. Video laryngoscope that can be used to ensure correct placement of the catheter.
2. Insert the Surf Cath orally and pass it through the vocal cords until the black marking is below the cords (the bend in the tube should be at the level of the cords) and hold it in position at the lips.
3. Remove the laryngoscope blade.
4. Close the mouth to maintain PEEP.
5. Take note of the measurement at the lips.

Airway Assistant

Connect the surfactant syringe to the catheter hub and instill the surfactant in 2-4 aliquots over 15-30 seconds.

Second Assistant

Aspirate intragastric tube intermittently during the administration of surfactant to ensure surfcath correctly positioned.

Proceduralist

1. If catheterization of the trachea is not possible within 20-30 seconds, remove the laryngoscope and allow recovery on nCPAP before attempting tracheal catheterization again. Consider abandoning the procedure after three unsuccessful attempts or surfactant aspirated through the intragastric tube.

2. Remove the catheter immediately after administering surfactant and continue nCPAP.
3. Apply chin strap.

Post-procedure

1. Remain with infant until heart rate, oxygen saturations and respiratory effort are close to baseline values.
2. Restore the infant to their previous position.
3. Avoid oral suctioning immediately after the procedure to avoid coughing or gagging.
4. Document the details of the procedure in the integrated clinical notes and record the procedure in the infant's observation chart.

STUDY:

Conclusions and Relevance: The results of this long-term multicentre cohort study suggest that LISA may be associated with reduced risks of adverse outcomes (BPD) in extremely preterm infants (**JAMA**
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