

Basic Scope Care and Handling

Basic principles behind fibre-optic instruments

- Light and image transfer via coherent(image transmission) and incoherent (light) bundles
- Fibre coating with lower refractory index allowing for clearer image
- Working channel port
- Diopter rings/focusing
- Distal mobile segment
- Portable lithium light source or light guide cable

Scope Cleaning and Maintenance

- Checking the scope cleaned(soapy water) and sterilised
- Checking working channel flushed and working e.g. patent

Scope Handling

- Movement in 2 dimensions
- Body position/ straight scope technique
- Height of the patient/bed
- Angle of approach
- Lubrication
- Scope temperature/ Defogging

Oxford Box

- Familiarise
- Straight arm technique and planes of movement
- Orientation marker
- Emphasis on fine movements
- Emphasis on damaging the scope on withdrawal if tip bent

Demonstrate Oral Fibreoptic Intubation

- Recognise conduit airways- Ovassapian/Berman/VBM mask
- Tube introduction via oral route
- Repositioning Manoeuvres

Nasal Fibre-optic Techniques

Preparation

- Scope handling and body positioning
- Drying Agents
- Sniff Test
- Vasoconstrictors

Differences in asleep technique

- Apnoea technique or ventilated technique
- Jaw thrust
- Laryngoscopy
- Pulling tongue forward

Tubes and Aids

- Tube Sizes 6/6.5/7/7.5
- Chimney airway/endoscopy mask/ nasal airway
- Best success rates ILMA soft tip reinforced best first pass success
- Lubrication
- External Scope diameter: internal tube diameter ratios for best first pass success
- Tongue protrusion in awake patients
- Suction-oral via yanker and via scope

Fibre-optic intubation using AIRSIM manikin

Stay in the black and out of the red!

- Check for tracheal rings
- Orientation/ post tracheal ring defect
- Check scope not advanced with tube (bronchospasm as carina tickled)

Correct Tube Placement

- Capnography
- Bag + chest movement
- Check Carina

Discussion Points

- Reversible short acting sedation
- Adrenaline nebulisers
- Prophylactic Cricothyroid Oxygenation
- Split Nasopharyngeal Airways
- Awake Tracheostomy

Needle Cricothyroidotomy

Equipment

- Manikin
- Needles –Ravussin, Patil, Venflon, Quicktrack
- Manujet

Principles behind Cricothyroid Puncture

- Oxygenation not ventilation
- Quick fix. Maximum 40 mins
- Airway obstructed completely –air outlet required
- Elective Cricothyroid insufflation
- Local Anaesthesia with vasoconstrictor

Limitations of needle Cricothyroidotomy

Ravussin Cannulae

- Luer lock connector
- 15mm standard circuit connector
- Discuss conversion via guide wire to larger airway
- 13g kink resistant

Practical Technique

- Positioning
- Laryngeal stabilisation
- 90 degree puncture aspiration
- Turn to 60 degree angle
- Advance cannula over needle
- Check air aspiration
- Manujet Ventilation and connections
- Ravussin/Quicktrack/Patil/Venflon

Recognise

- Patil Set/ Quicktrack
- Quicktrach very short and only 4mm internal diameter i.e. unlikely to sufficiently ventilate only oxygenation possible
- Minitracheostomy performs poorly compared to needle and surgical and seldinger techniques

Surgical Cricothyroidotomy

Understand

- Traditional Cricothyroidotomy- Thyroid cartilage lifted cephalad
- Rapid Four Stage Technique- Cricoid cartilage lifted caudad
- Seldinger approach- insertion of a guide wire

Complications of Cricothyroidotomy

- Bleeding
- Misplaced tube and subsequent problems
- Surgical Ephysema, Pneumothorax
- Trauma

Prior Preparation and Planning ABC

- Infiltration with local anaesthetic and adrenaline

Practical Skill of RFST

- Stand cephalad
- Positioning like intubation
- ? More anaesthetist friendly
- Size 10/11 Blade
- Tracheal hook (double hook less likely to snap cricoid ring)
- Patient positioning
- Immobilise the larynx
- 1cm incision through membrane (single step or skin sweep first)
- Insert hook and lift cartilage
- Insert size 6 tube cuffed
- Check ventilation

Melker Seldinger Set

- pre peel set
- set comes disassembled
- Size 6 malleable tube cuffed or uncuffed
- Cuffed tube longer
- Flexible tip guide wire to avoid piercing trachea and aids passage
- 90⁰ skin puncture and air aspiration followed by re-angulation to 60⁰
- Insertion of guide wire removal needle
- Stab incision at least 1cm to skin and membrane
- Melker dilator over guide wire
- Remove guide wire- obturator complex leaving Melker tube in situ
- Inflate cuff
- Check ventilation

Intubating and Proseal Laryngeal Mask Airways

Principles behind ILMA

- 93-99% (blind insertion) success rate with up to 2 attempts
- Oesophageal placement
- Trauma
- Fibreoptic assistance increases success rate
- Avoids unnecessary trauma
- Slightly slower

Clinical application

- Anticipated airway challenge
- Can ventilate cannot intubate

Disadvantages

- Expensive
- Requires 20mm mouth opening
- Training and skill retention
- Lower success with cricoid pressure
- Trauma used blind
- End of tube/Murphy's eye mistaken for carina

Practical Skills

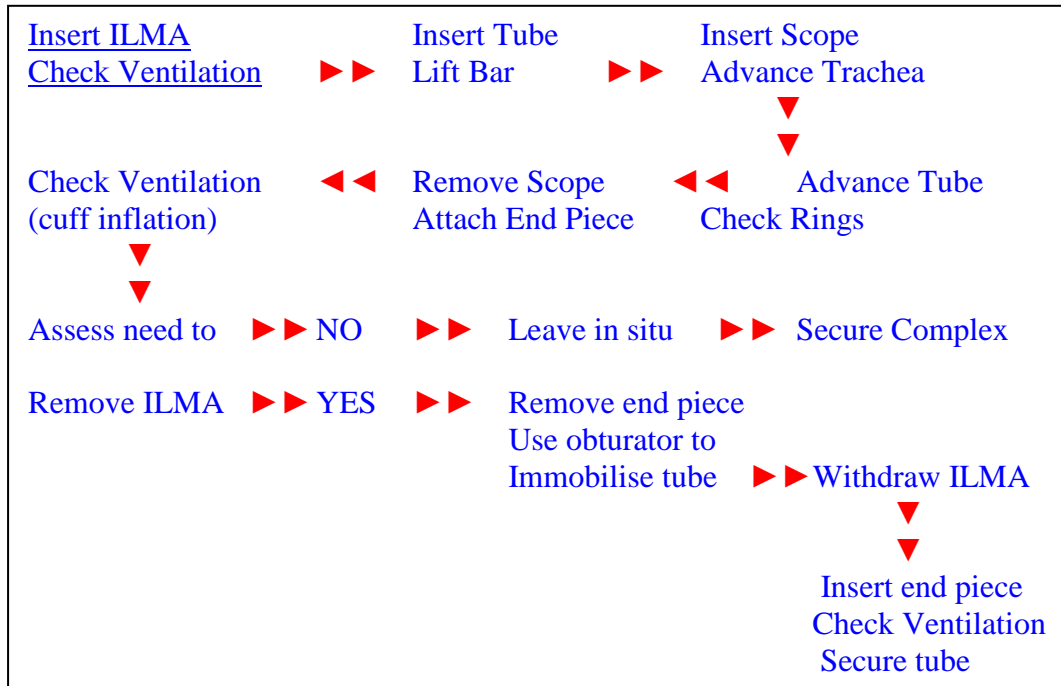
- Anatomical curve aids insertion without head and neck manipulation
- Rigid airway tube –centralises tracheal tube minimises arytenoid trauma and misplacement
- Guiding handle
- Standard 15mm connector
- Elevating bar-rigid, elevates + protects epiglottis but may damage scope

Tubes

- Multiuse or disposable tubes
- Reinforced
- Standard detachable end connector
- Bevelled end (lower risk of impinging on vocal cords)
- Specific Obturator

ILMA and Proseal cont.

ILMA Insertion



Principles of Proseal LMA

- Drain tube -clinical confirmation of correct mask position
- Designed to protect against aspiration Drain tube may prevent gastric insufflation in artificial ventilation
- PPV
- Seal pressures greater
- Introducer reduces need to place fingers in the patient's mouth

Proseal LMA Insertion

- Double cuff /Drain tube/Confirmation of placement/ use with NG tube

Rescue Airway with LMA and Aintree Catheter

Indications for Aintree assisted Oral Intubation

- Anticipated Difficult Airway e.g. spinal injury
- Can't intubate can ventilate via Berman or LMA

Demonstrate Aintree

- 4mm internal diameter blue conduit specifically designed for use with fibre-scope
- Ability to jet ventilate – show connections to Manujet
- Ability to connect to circuit 15mm standard connector- show connections

Serious Considerations

- NOT a tube exchange catheter
- Too short and stiff for nasal route
- Barotrauma
- Direct Trauma to trachea/lungs and oesophagus
- Misplacement and inflation of stomach

Demonstrate Limitations Intubation via LMA

- Size 4 reusable LMA will allow passage size 7 tube (NOT all reinforced 7's though)
- Disposable LMA's differ dramatically
- Reinforce- awareness of knowing if tube passes via LMA if using in rescue situation

Practical Demonstration fiberoptic assisted intubation via LMA

**Practical Demonstration fibreoptic assisted
Aintree Intubation**

- Insert LMA/Berman- check ventilation
- Demonstrate placing aintree onto scope with lubrication
- Insert aintree scope complex and confirm tracheal rings
- Remove scope (**reinforce not** an aggressive aintree over scope railroad or trauma via bronchi will ensue; aintree left in situ as scope removed)
- Demonstrate aintree connections to 15mm & manujet
- +/-Remove LMA
- Demonstrate tube over aintree
- Check ventilation
- Check rings

Airway Anatomy and Anaesthesia of the Airway

Nerve Supply;

- Nasal Mucosa- Trigeminal (Ethmoidal Nerves)
- Oropharynx- Glossopharyngeal
- Superior Larynx and Cords - Superior Laryngeal Nerves
- Infraglottic Airway-Recurrent Laryngeal Nerve

Methods of Anaesthesia

- Nerve Blockade
- SAYG

LA Preparations -Amide

- Infection and pH of tissues- lipid soluble free base release
- First pass metabolism- 70%
- Plasma lignocaine concentrations primarily from trachea and bronchial tree
- Toxic Doses 1-10mg/kg have been described but textbook 7mg/kg with vasoconstrictor

Topicalisation of Nasal Mucosa

- Otrivine (Xylometazoline 0.1%)
- Nebulised lignocaine
- Instillagel (2%)
- Phenylephrine and Lignocaine preparations
- Cocaine (5%)

Topicalisation Oropharynx

- Nebulisers (smaller particles go further!)
- Swish and Swallow with Instillagel
- 10% spray (banana essence)
- SAYG
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Topicalisation Vocal Cords

- SAYG directly via scope working channel port
- SAYG via epidural catheter via working channel
- MAD devices oral and nasal
- Mad devices and topicalisation via nasopharyngeal airways

Practical Demonstration of Anaesthesia for Awake Fiberoptic Intubation

- Drying agents
- Sedation
- Topicalisation

Discuss

- Glossopharyngeal Nerve Block
- Superior Laryngeal Nerve Block
- Cricothyroid Puncture