

One Lung Ventilation

A. Indications:

- 1) Prolonged unilateral lung collapse for more than one week and fail conservative therapy
- 2) Persistent unilateral severe acquired cystic lung disease. Less effective for congenital lesions (e.g. cystic adenomatoid malformation, congenital lobar emphysema)
- 3) Persistent unilateral PIE
- 4) Broncho-pleural fistula not responsive to treatment with a tube thoracostomy (may require surgery for fistula suturing)
- 5) Prevention of infected material to spill over to the opposite lung, e.g. a lung abscess.

B. Technique of selective bronchial block:

- 1) Use a 5 FR Swan-Ganz catheter (SGC) or Fogarty catheter.
- 2) Pretests SGC balloon for leakage and verify air volume necessary for inflation (usually 0.6 cc).
- 3) Pre-measure distance necessary for SGC insertion on infant's chest radiograph and from endotracheal tube length.
- 4) Insert SGC via the nostril. Under direct laryngoscopy, using an alligator forceps pass the catheter into the trachea alongside the endotracheal tube (ETT). If this is difficult to accomplish, and then pull the ETT into the hypopharynx, insert the SGC into trachea, and then re-intubate with ETT.
- 5) For insertion of SGC into left main bronchus, position head in extension toward the right. For passing SGC into right truncus intermedius, turn the head toward the left.
- 6) Advance catheter to predetermined length. DO NOT INFLATE BALLOON YET.
- 7) Check catheter tip position by rapidly injecting air through the SGC lumen (not balloon side port) while two assistants auscultate simultaneously on each axillae. If the catheter appears inappropriately positioned, pull catheter back to original starting position (but not out of trachea) and repeat steps 5, 6 and 7.
- 8) If SGC keeps entering the wrong side, advance ET tube to the main bronchus (the wrong side)

- and then advance SGC. This may increase chance for SGC to enter the correct side.
- 9) Confirm SGC position by chest x-ray.
 - 10) Securely fix ET tube and SGC (nasal route is preferred).
 - 11) Now inflate SGC with pre-determined volume (usually 0.6 ml) closely observing vital signs and oxygenation.
 - 12) Every hour on the hour, the balloon must be completely deflated and then re-inflated with pre-determined volume. This prevents partial bronchial occlusion from partially deflated balloon, which may cause a ball-valve effect and lead to pneumothorax.
 - 13) Daily chest x-ray or prn.
 - 14) Radiological resolution of the lesion usually takes 3-5 days. The SGC is left inflated (with deflation and reinflation every hour on the hour) for an additional 24 hours.
 - 15) SGC is then deflated and left in position for another 24 hours (for in case of recurrence).
 - 16) Remove catheter if no evidence of recurrence.

C. Complications

- 1) Hypoxia
- 2) Bradycardia
- 3) RUL collapse (for SBI of right lung)
- 4) Pneumothorax (partial occlusion and ball-valve effect)
- 5) Sudden severe deterioration (deflate balloon to rule out occlusion of trachea by balloon)
- 6) Pneumonia
- 7) Pressure necrosis at balloon site

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