LUNG DEFLATION TECHNIQUES:
AN UPDATE

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Why lung deflation and not lung isolation techniques?. The answer will be given during the presentation.
We have classified different techniques on one lung deflation into: from within and from without techniques. From without means the use of capnothorax (CO2 insufflation) and single lumen endotracheal tube. From within, means all tools currently in use through tracheobronchial lumen.

A) Without technique:
General anesthesia with OLV and Capnothorax. This is our preferred technique for video-assisted thoracoscopic sympathectomy (VATS). That technique comprises the use of single lumen endotracheal tube (SLT) and capnothorax. From our experience on VATS procedures we believe that the combination of balanced anesthesia and SLT with interpleural CO2 insufflation provides excellent operating and oxygenation conditions during. Moreover, the use of interpleural CO2 insufflation at a rate of 0.5-1L/min with a maintained intrathoracic pressure (ITP) < 6mmHg provides appropriate hemodynamic stability. In our practice we start with ITP of<6 mmHg and maintain it at 2mmHg through the procedure. In a recent study we have showed significant decrease in the dynamic lung compliance during capnothorax under general anesthesia with no deleterious intra or postoperative sequelae.

B) Within technique:
1) Double lumen tube (DLT).
To accomplish OLV, double-lumen endobronchial tube (DLT) is commonly used for patients larger than 30kg b.w. Hypoxemia is the major drawback of OLV using DLT and neither its occurrence nor severity can be reliably predicted in the individual patient. Oftentimes, hypoxemia during OLV is due to improper positioning of the DLT. Therefore fiberoptic bronchoscopy (FOB) checking of DLT position is mandatory. It is recommendation that a FOB should be used to place accurately the DLT in all patients. Today a silicone type of DLT has been introduced with possible fewer traumas to tracheobronchial tree. In order to minimize the consequences of hypoxemia under general anesthesia, interventions possibly interfering with hypoxic pulmonary vasoconstriction (HPV) therefore should be avoided. Since high dose inhalational anesthetics in experimental setting worsened oxygenation during OLV, their use had been discouraged. However, anesthetics including volatiles, at normal doses do not inhibit HPV to a clinically relevant degree and therefore may be safely used in patients during OLV.
2) Bronchial blockers.
This technique can be accomplished with either, Fogarty catheter, Foley’s catheter or swan ganz catheter which is inserted guided by FOB through the single lumen endotracheal tube. Recently the Univent tube or torque control blocker (TCB) was introduced and successfully used to achieve OLV during thoracoscopy guided with FOB. If the patient is too small (less than 30kg b.w) the pediatric sizes of Univent tube are used and could replace the unavailability of pediatric DLT sizes. Wire endobronchial blockers (Arndt) are also available in two sizes, 9 and 5Fr. Also recently the Cohen deflecting tip blocker became available.

Further readings:
7. El-Dawlatly A. Internet J Anesthesiology 2002; 6(1).