

Monthly Safety Notice

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National Baromedical Services, Inc.

Previous Pulmonary Lobectomy as a Hyperbaric Risk

Background

Patients with a history of intrathoracic surgery have an increased risk for pulmonary barotrauma, pneumothorax and concomitant arterial gas embolism while undergoing hyperbaric oxygen therapy. Therefore, previous chest surgery should be considered as a relative contraindication to HBO.

The Issue

In patients who have undergone a lobectomy the resulting void is typically replaced by fluid and is likely to be noted on plane film or computed tomography. As fluid is a non-compressible medium, there should be no significant risk of decompression barotrauma as such; however, it is possible that a leak could exist or occur at the surgical anastomotic site. Alternatively, traction on existing lung tissue, because of scarring, could result in barotrauma. In general, any scarring or lesions that involve the pleural surfaces have a greater risk for pneumothorax during changes in pressure while those lesions deeper within the lung parenchyma may be less likely to result in development of extra-pleural gas accumulation. Another issue is the presence of underlying disease in the remaining lung. Should pulmonary barotrauma result in a pneumothorax, significant pulmonary compromise could result in the setting of reduced lung capacity. In addition, consideration should be given to the theoretical risk of enhanced tumor angiogenesis in patients with active or a history of cancer.

As a general rule, patients who have undergone chest surgery pose a low risk for barotrauma when hyperbaric oxygen therapy is applied appropriately. HBO treatment should be held for a minimum of 2 weeks post operatively. Full radiographic resolution of any extra-pulmonary gas should be documented with an otherwise normal lung exam prior to offering a trial of pressure. The inhalation of 100% oxygen increases resorption of extra-pulmonary gas by several orders of magnitude, which lessens the risk of developing a tension pneumothorax in the event of a trans-pulmonary gas leak. In addition, the use of a slow ascent rate (0.5psi/min) will lessen the risk of barotrauma by allowing a greater time for pressure equilibration across the lung.

Consideration should also be given to having a nebulized bronchodilator available within the chamber in the event of bronchospasm.

Bottom Line

While the post-pneumonectomy patient is at risk for complications related to HBO, prior chest surgery need not be considered as an absolute contraindication. If the benefits of HBO are deemed to outweigh the risks, a trial of pressure would be in order after an appropriate evaluation and proper risk mitigation techniques (e.g. slow decompression rate) are employed.