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Right Elevated Hemidiaphragm Following Left-sided In-situ Right Internal Thoracic Artery Grafting: Incidence and Implications

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Background:

Contrary to the left side, the incidence, predictors and implications of right elevated hemi-diaphragm (REH) remain undetermined. In-situ left-sided right internal thoracic artery (RITA) grafting warrant high proximal RITA mobilization and pericardial tunneling, increasing the risk of right phrenic nerve injury.

Methods:

432 patients undergoing in-situ left-sided BITA configurations (2007-2012) were grouped according to retro-aortic (n=333, 77%) or ante-aortic RITA grafting. REH was determined following serial chest x-rays by independent radiologist and defined as complete (elevation of $\geq$ 2 intercostal spaces) or partial.

Results:

The overall incidence of complete REH was 2.5% (11/432), of whom 64% (n=7) were transient achieving radiologic spontaneous recovery by median 2.4 ± 0.3 weeks. Permanent REH was documented in 0.9% (4/432), comparable between the retro- and ante-aortic groups (4/333 vs 0/99, p=0.349), and similar to permanent left-side elevated hemi-diaphragm (LEH) (also 0.9%). However, distribution of permanent LEH was significantly higher in the ante-aortic technique (3/99 vs 1/333, p=0.039). Concomitant bilateral elevated hemi-diaphragm was not documented. During follow-up (median 38 months) none of the patients underwent right (or left) diaphragmatic plication. Partial REH occurred in 1.4% and was not associated with distinct adverse early or late respiratory outcome.

Conclusions:

The majority of REH is transient. Despite distinct right-side phrenic nerve anatomy the incidence of permanent REH is low, comparable between both crossover RITA techniques, and not higher than left-sided. Permanent LEH, however, is more frequent following ante-aortic RITA configuration implicating on LITA management. The entity of partial REH is not associated with adverse respiratory outcome.