Cardiac insufficiency as a main predictor for persistent effusions after surgery on congenital heart disease

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Objectives: This study analyses different pre-, intra- and postoperative risk factors for chylothorax and persistent serous effusions (>7d) after congenital heart surgery and develops equations to calculate probabilities for their occurrence.

Methods: Retrospective review of different medical databases at the University Hospital of Erlangen between 01/14 and 12/16. Full model regression analysis was used to identify risk factors. Logistic equations were set up to calculate probabilities. Discriminative power of the developed models was checked with the c-statistics.

Results: Sixty-eight of 745 patients developed chylothorax (9.1%) and 125 of 677 persistent serous effusions (18.5%). Lower temperature (p=0.043; OR=0.899), Trisomy 21 (p=0.001; OR=5.548), a higher VIS at the day of surgery (p=0.001; OR=1.070) and assist device usage (p=0.001; OR=5.779) were significantly associated with chylothorax. Risk factors for persistent serous effusions were a given or possible involvement of the aortic arch during the operation (p=0.000; OR=3.982 und 2.905), univentricular hearts (p=0.019; OR=2.644), a higher number of previous heart surgeries (p=0.014; OR=1.436), a higher VIS at 72h after surgery (p=0.019; OR=1.091), a higher CVP at surgery (p=0.046; OR=1.076) and an AoX time > 86min (p=0.023; OR=2.223), as well as assist device usage (p=0.002; OR=10.281). Both types of effusions were associated with a significantly higher morbidity and mortality.

Conclusion: Persistent serous effusions is associated with postoperative cardiac insufficiency, represented by a higher vasoactive ionotropic score at 72h after surgery, an AoX time > 86min and elevated CVP directly after surgery. The developed logistic equations help to estimate likelihoods in the future.