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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.