The value of pulse pressure and stroke volume variation as predictors of fluid responsiveness during open chest surgery

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We investigated the ability of pulse pressure variation and stroke volume variation to predict fluid responsiveness during mechanical ventilation in patients undergoing open chest surgery by comparing their respective correlations with cardiac output changes induced by leg elevation. Serial leg elevation manoeuvres were performed before and after sternotomy in 15 patients scheduled for elective off-pump coronary bypass surgery. Under closed chest conditions, both pulse pressure variation and stroke volume variation correlated well with the induced cardiac output changes ($r = 0.856$, $p = 0.002$ and $r = 0.897$, $p = 0.0012$, respectively). These correlations were lost for both parameters following sternotomy. Our data show that pulse pressure variation and stroke volume variation are valid predictors of fluid responsiveness under closed chest conditions but that this property no longer holds when the chest is open.