Impact of the cardio-hepatic syndrome on outcomes after transcatheter mitral valve edge-to-edge repair

L. Stolz[1], M. Orban[1], N. Karam[2], E. Lubos[3], M. Wild[4], F. Praz[4], D. Braun[1], P. Doldi[1], N. Tence[2], C. Hagl[5], J. Mayerle[6], M. Naebauer[1], D. Kalbacher[3], S. Massberg[1], J. Hausleiter[1]

[1]Clinic of the University of Munich Großhadern, Medizinische Klinik und Poliklinik I, Munich, Germany; [2]European Hospital Georges Pompidou, Paris, France; [3]The University Medical Center Hamburg-Eppendorf, Hamburg, Germany; [4]Inselspital - University of Bern, Bern, Switzerland; [5]Clinic of the University of Munich Großhadern, Herzchirurgische Klinik und Poliklinik, Munich, Germany; [6]Clinic of the University of Munich Großhadern, Medizinische Klinik und Poliklinik II, Munich, Germany

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Background: The prognostic value of impaired liver function in the presence of moderate-to-severe and severe mitral regurgitation (MR), also called cardio-hepatic syndrome (CHS), for outcomes in patients undergoing transcatheter edge-to-edge repair (TEER) has not been studied yet.

Purpose: In this work, we aimed at identifying the prognostic impact of the CHS on two-year all-cause mortality in patients undergoing TEER compared to established risk factors. Furthermore, we evaluated the change in hepatic function after TEER.

Methods: Hepatic function was assessed by laboratory parameters of liver function (bilirubin, gamma glutamyl transferase [GGT], alkaline phosphatase [AP], aspartate and alanine aminotransferase [AST and ALT]). We defined CHS as elevation of at least two out of three laboratory parameters of hepatic cholestasis (bilirubin, GGT, AP). The impact of CHS on two-year mortality was evaluated using a proportional hazards Cox model. The change in hepatic function after TEER was evaluated by repeat laboratory testing at follow-up.

Results: We included 1083 patients who underwent TEER for highly symptomatic primary or secondary MR at four high volume academic European centers between 2008 and 2019. In 66.4% of patients, we observed elevated levels of either bilirubin, GGT or AP. CHS was present in 23% of patients and showed strong association with a reduced two-year survival (52.9% vs. 87.0% in patients without CHS, $p<0.01$). In a multivariate Cox regression model, CHS was identified as a strong and independent predictor of increased two-year mortality (hazard ratio 1.49, p=0.03). In patients with successful MR reduction $\leq$2+ (90.7% of patients), parameters of hepatic function significantly improved from baseline to follow-up (–0.2 mg/dl for bilirubin; –21 U/l for GGT, respectively, $p<0.01$), while they did not in case of residual postprocedural MR $>$2+.

Conclusions: CHS can be observed in up to 25% of patients undergoing TEER and is associated with impaired two-year survival rates. Successful TEER is associated with decreased levels of hepatic enzymes at follow-up evaluation.