Compartment pressure of the rectus sheath accurately reflects intra-abdominal pressure in a porcine model

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BACKGROUND
To investigate whether the compartment pressure of the rectus sheath (CPRS) reflects the intra-abdominal pressure (IAP) under various conditions of intra-abdominal hypertension (IAH) in a pig model.

METHODS
Design: Prospective experimental study with in vivo pressure measurements. Setting: Institute for Clinical and Experimental Surgery, University of Saarland. Animals: Seven domestic male pigs (body weight 34.8+/-2.5 kg). Interventions: Stepwise increase and decrease of IAP by means of CO(2) pneumoperitoneum. Continuous direct measurement of the IAP and correspondent indirect IAP measurement techniques including analysis of intravesical pressure (IVP), femoral vein pressure (FVP), and CPRS.

RESULTS
Bland-Altman analysis comparing direct IAP measurement with correspondent CPRS showed good agreement for IAP between 12 mm Hg and 30 mm Hg (bias -0.5 mm Hg, lower and upper limits of agreement (LLA/ULA) -3.5/2.5 mm Hg). FVP (bias -0.3 mm Hg, LLA/ULA -2.3/1.6 mm Hg) and IVP (bias 0.4 mm Hg, LLA/ULA -2.1/2.9 mm Hg) demonstrated similar results compared with direct IAP measurement. Agreement was worse for all indirect IAP measurement techniques for IAP<12 mm Hg.

CONCLUSIONS
CPRS accurately reflects IAP for IAP> or =12 mm Hg. Accuracy is similar to established indirect IAP measurement techniques.

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