

This study investigates the best irrigation volume for an intravenous port by simulating the clinical scenario ex-vivo to access its usefulness” Wu et al (2018).

Abstract:

BACKGROUND: An intravenous port, which differs from a central venous catheter, has an injection chamber at the end of the catheter. This structural difference causes the irrigation flow pattern to be quite different from that of the central venous catheter. Furthermore, the intraluminal volume differs due to the size of the injection chamber and implanted catheter length. Hence, the ideal recommended irrigation volume varies because of differences in intraluminal volume, however, the recommended irrigation volume is 10 ml and may be a cause for reported port malfunctions. This study investigates the best irrigation volume for an intravenous port by simulating the clinical scenario ex-vivo to access its usefulness.

MATERIALS AND METHODS: This study was composed of two tests. The irrigation volume test attempted to quantify the irrigation volume of an implanted port while the irrigation rate test attempted to simulate daily nursing practice in order to clarify the effect of irrigation flow. The human blood needed for the simulation was donated by volunteers and the total volume was 10 ml per test. The irrigation volume test was done by syringe pump with varying pre-set irrigation volume after the port and connected catheter were filled with volunteer blood. After irrigation with pre-set volume, the retained intraluminal solution was collected and quantified by Bradford assay in order to titrate the best irrigation volume. The irrigation rate test tried to simulate daily maintenance practice in different settings with the quantified irrigation volume as identified by the irrigation volume test. The retained intraluminal solution was collected and quantified by Bradford assay in order to confirm the efficacy of the quantified irrigation volume.

RESULTS: In both SVC and IVC ports, we identified the twenty times the intravascular volume as sufficient for a complete wash out of the blood component in the irrigation volume test. The minimal irrigation volume for SVC and IVC port were 10 ml and 15.6 ml respectively. In irrigation rate test, the irrigation for SVC and IVC port was 10 and 20 ml, respectively, for the sake of preparation convenience. We not only identified the importance of preparation, i.e. irrigation of the extension line but also confirmed the efficacy of the recommended irrigation volume.

CONCLUSION: The irrigation volume should be varied according to the intraluminal

volume. Maintenance should be performed after the extension line has been irrigated. The recommended port irrigation volume for SVC and IVC route were 10 and 20 ml, respectively.

[Full Text](#)

Reference:

Wu, C.Y., Cheng, C.H., Fu, J.Y., Chu, Y., Wu, C.F., Chiu, C.H., Ko, P.J. and Liu, Y.H. (2018) Recommended irrigation volume for an intravenous port: Ex vivo simulation study. PLoS One. 13(8), p.e0201785.

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