



This study is the first try to numerically find out what hemodynamic parameters are predisposed to the initiation and formation of thrombus after CVC insertion” Peng et al (2017).

Abstract:

The tunneled central venous catheter (CVC) plays an important role for hemodialysis patients, but CVC-related thrombosis in the central veins remain problematic. This study is the first try to numerically find out what hemodynamic parameters are predisposed to the initiation and formation of thrombus after CVC insertion.

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And the potential relationship between hemodynamic parameters and the incidence rates of thrombosis occurrence was explored. The results revealed that the CVC insertion led to a significant increase of hydraulic resistance, wide-ranging abnormally high wall shear stress (WSS), and a great loss of flow rotation in the vein. Moreover, the clinical data showed that thrombosis mainly occurred at sections where most blood flow lost spiral rotation after the CVC insertion, but no corresponding match was observed between the occurrence of thrombosis and the flow velocity or WSS. We speculate that the destruction of the flow rotation in the central vein is a precursor to the thrombus formation around CVC, and an

introduction of spiral flow with the CVC insertion may possibly help to protect the central vein from thrombosis. Further animal and clinical experiments should be carried out to test and verify this speculation.

Full Text

Reference:

Peng, L., Qiu, Y., Huang, Z., Xia, C., Dai, C., Zheng, T. and Li, Z. (2017) Numerical Simulation of Hemodynamic Changes in Central Veins after Tunneled Cuffed Central Venous Catheter Placement in Patients under Hemodialysis. *Scientific Reports*. 7(1), p.15955.

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