



The purpose of this study was to compare the pressure of injection rate and CT number of a 24-gauge fenestrated catheter with an 22-gauge non-fenestrated catheter for i.v. contrast infusion during CT” Yoshiura et al (2019).

Abstract;

PURPOSE: A three-dimensional (3D) image from computed tomography (CT) angiography is a useful method for evaluation of complex anatomy such as congenital heart disease. However, 3D imaging requires high contrast enhancement for distinguishing between blood vessels and soft tissue. To improve the contrast enhancement, many are increasing the injection rate. However, one method is the use of fenestrated catheters, it allows use of a smaller gauge catheter for high-flow protocols. The purpose of this study was to compare the pressure of injection rate and CT number of a 24-gauge fenestrated catheter with an 22-gauge non-fenestrated catheter for i.v. contrast infusion during CT.

METHODS: Between December 2014 and March 2015, 50 newborn patients were randomly divided into two protocols; 22-gauge conventional non-fenestrated catheter (24 newborn; age range 0.25-8 months, body weight 3.6 ± 1.2 kg) and 24-gauge new fenestrated catheter (22 newborn; age range 0.25-12 months, body weight 3.3 ± 0.9 kg). Helical scan of the heart was performed using a 64-detector CT (LightSpeed VCT, GE Healthcare) (tube voltage 80 kV; detector configuration 64×0.625 mm, rotation time 0.4 s/rot, helical pitch 1.375, preset noise index for automatic tube current modulation 40 at 0.625 mm slice thickness).

RESULTS: We compared the maximum pressure of injection rate, CT number of aortic enhancement, and CT number of pulmonary artery enhancement between both protocols. The median injection rate, CT number of aortic enhancement, and CT number of pulmonary artery enhancement were 0.9 (0.5-3.4) ml/s, 455.5 (398-659) HU, and 500.0 (437-701) HU in 22-gauge conventional non-fenestrated catheter and 0.9 (0.5-2.0) ml/s, 436.5 (406-632) HU, and 479.5 (445-695) HU in the 24-gauge fenestrated catheter, respectively. There are no significantly different between a 24-gauge fenestrated catheter and 22-gauge non-fenestrated catheters at injection rate and CT number. Maximum pressure of injection rate was lower with 24-gauge non-fenestrated catheters (0.33 kg/cm²) than 22-gauge non-fenestrated catheters (0.55 kg/cm²) ($p < 0.01$). Conclusion: A 24-gauge fenestrated catheter performs similarly to an 22-gauge non-fenestrated catheter with respect to i.v. contrast infusion and aortic enhancement levels and can be placed in most subjects whose veins are deemed insufficient for an 22-gauge catheter.

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Yoshiura, T., Masuda, T., Matsumoto, Y., Sato, T., Yamashita, Y., Kobayashi, Y., Ishibashi, T., Oku, T., Imada, N. and Funama, Y. (2019) Usefulness of Fenestrated Catheters for i.v. Contrast Infusion Cardiac CT Angiography for Newborn Patients during the Congenital Heart Disease. *Nihon Hōshasen Gijutsu Gakkai Zasshi*. 75(8), p.765-770. doi: 10.6009/jjrt.2019_JSRT_75.8.765. .

