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MEASUREMENT OF THE COMPLIANCE OF THE HUMAN FOREARM VEINS WITH PLETHYSMOGRAPHY USING RADIONUCLIDE.

H.Takatsu, K.Gotoh, T.Suzuki, Y.Ohsumi, Y.Yagi, T.Tsukamoto, S.Hirakawa. The Second Department of Medicine, Gifu University School of Medicine, Gifu 500, Japan.

We measured specific compliance (C_{vsp}) of human forearm veins by performing occlusion plethysmography with radionuclide (RN), using gamma camera, in 22 patients with various cardiac disease. After RN-angiocardiology was performed with Tc-99m-RBC and equilibrium was achieved, RN counts of the ROI and the venous pressure (VP) measured from the needle of the forearm were recorded simultaneously before and after inflating or deflating rapidly a cuff placed round the upper arm. Then RN counts-pressure curve was constructed. From this curve, volume-pressure (V-P curve) of the forearm veins was plotted by using our own equation; $C_{vsp} = k \cdot (R_{10} - R_a)$, where k is the slope of the tangent drawn on this curve at 10 mmHg of VP, R_{10} and R_a represent the RN counts when VP is 10 mmHg and a mmHg.

Specific compliance ($C_{vsp}(10)$) of human forearm veins at 10 mmHg of VP, which was obtained by using the V-P curve, was $0.024 \pm 0.007 \text{ mmHg}^{-1}$ (mean $\pm$ SD). In addition, human systemic venous compliance ($C_{sv}(10)$), which was estimated from our the other equation; $C_{sv} = C_{vsp} \times (\text{total blood volume} - \text{central blood volume}) \times 0.8$, was $73.8 \pm 22.1 \text{ ml mmHg}^{-1}$ (mean $\pm$ SD).

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CLINICAL EVALUATION OF RADIONUCLIDE ANGIOGRAPHY FOR ARTERIAL DISEASES.

S.Sugiyama, K.Miyaishi, Y.Nakamura, H.Niibe, T.Nagai. School of Medicine Gunma University Gunma.

Since radionuclide angiography (RNA) is a non-invasive examination for arterial disease. The number of RNA examination is increasing in our institute. The purpose of this study to evaluate the clinical value of the diagnosis of arterial diseases. The subjects were 125 patients including 74 patients with ASO, 32 with aneurysm, 19 with aortitis syndrome, on whom RNA examination by Tc-99m HSA had been performed. Stenotic change (SC), obstructive change (OC) and collateral circulation (CC) were evaluated by visual interpretation of RNA images. In ASO cases, results of RNA were compared with Fontaine's classification which indicated the grade of clinical symptoms by ischemic changes. The frequency of CC associated with SC and OS in grade 2 showed higher frequency than in grade 3 or 4. In comparison with the contrast X ray angiography, RNA showed a sensitivity of 71%. In cases of aneurysm and aortitis syndrome, RNA showed the sensitivity of 53% and 42%, respectively.

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K.Nagase, H.Mitsuyama. Juntendo University School of Medicine, Tokyo.

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EVALUATION OF HEMODYNAMIC CHANGES OF DEEP VEIN BY RI VENOGRAPHY.

N.Takeyasu, K.Taira, T.Sakai and S.Yabuki. 3rd dept. of Internal Med. Toho Univ.School of Med, Tokyo.

RI Venography is one of the noninvasive method to detect venous thrombosis. In this study, the hemodynamic change of the deep vein blood flow was evaluated using this method.

Subjects were 15 patients with VVI permanent pacemaker and 15 normal subjects. The initial change of the deep vein blood flow is measured by the postural change from supine to upright position and compared with the flow in supine and that in upright position. Tc-99m HSA (6 mCi) was injected into the superficial vein at the back of the foot. Gamma camera interfaced with minicomputer was placed on the knee joint and the scintiscan was performed for 200 sec. (2 sec. interval) after the injection. Two ROIs (25 pixel) were settled on the deep vein with 30 cm distance on CRT imaging monitor and time activity curves were recorded. The flow velocity and the blood volume were determined using the time between two activity peaks and the peak count of activity respectively.

According to the postural change, the patients with a pacemaker showed the decreased flow velocity and the increased blood volume, i.e., the marked venous congestion in lower extremities. This result indicates that RI Venography shows relatively good applications to the hemodynamic study.