

pressure from bedside evaluation of the jugular venous waveform is poor, particularly when performed by physicians in training. Conventional ultrasound measurement of the inferior vena cava(IVC) accurately predicts RA pressure, but the cost, lack of portability, and specialized training required to acquire and interpret the data render this modality impractical for routine clinical use. The objective of this study was to compare physical examination with hand-carried ultrasound(HCU) in the detection of elevated RA pressure(> 10 mm Hg). After limited training (4 hours didactic and 20 studies), 4 internal medicine residents using an HCU device estimated RA pressure from images of the IVC in 40 consecutive patients <1 hour after right-sided cardiac catheterization. RA pressure was also estimated from examination of the jugular venous pulse (JVP) in 40 patients before right-sided cardiac catheterization. RA pressure was successfully estimated from HCU images of the IVC in 90% of patients, compared with 63% from JVP examination. The sensitivity for predicting RA pressure > 10 mm Hg was 82% with HCU and 14% from JVP inspection. Specificities were similar between the techniques. Overall accuracies were 71% using HCU and 60% with JVP assessment. In conclusion, internal medicine residents with brief training in echocardiography can more frequently and more accurately predict elevated RA pressure using HCU measurements of the IVC than with physical examination of the JVP.

住院医师采用体检与手提式超声检查估计右房压的对比

医师于床旁根据颈静脉波形准确估计右房(RA)压力的能力较弱,尤其是培训医师。用传统超声测定下腔静脉(IVC)可以准确预测RA压力,但是由于费用高、不便携以及需要专业培训以便获取并解释检测结果等特点,使得这种方法不适于常规临床应用。本研究旨在比较利用体格检查与手提式超声(HCU)检查RA压力升高(> 10 mmHg)的准确性。接受有限的培训后(4 h教学和20次实习),4位内科住院医师利用HCU连续检测40例之前1 h内接受了右心导管术的患者,根据IVC图像估计RA压力。此外,在右心导管术前根据颈静脉波形(JVP)估计40例患者的RA压力。利用HCU检测的IVC图像可估计90%患者的RA压力,而根据JVP检查只可以估计63%患者的RA压力。利用HCU和JVP预测RA压力 > 10 mmHg的灵敏性分别为82%和14%。两种方法的特异性相似。HCU和JVP检测的总准确度分别为71%和60%。总之,与体格检查JVP相比,

内科住院医师经短暂超声培训后利用HCU检测IVC可更大范围、更准确地预测RA压力升高。

0737. Changes in Coronary Anatomy and Physiology After Heart Transplantation

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Cardiac allograft vasculopathy(CAV) is a progressive process involving the epicardial and microvascular coronary systems. The timing of the development of abnormalities in these 2 compartments and the correlation between changes in physiology and anatomy are undefined. The invasive evaluation of coronary artery anatomy and physiology with intravascular ultrasound, fractional flow reserve, coronary flow reserve, and the index of microcirculatory resistance (IMR) was performed in the left anterior descending coronary artery during 151 angiographic evaluations of asymptomatic heart transplant recipients from 0 to > 5 years after heart transplantation(HT). There was no angiographic evidence of significant CAV, but during the first year after HT, fractional flow reserve decreased significantly(0.89 ± 0.06 vs 0.85 ± 0.07 , $p = 0.001$), and percentage plaque volume derived by intravascular ultrasound increased significantly($15.6 \pm 7.7\%$ to $22.5 \pm 12.3\%$, $p = 0.0002$), resulting in a significant inverse correlation between epicardial physiology and anatomy($r = -0.58$, $p < 0.0001$). The IMR was lower in these patients compared with those ≥ 2 years after HT(24.1 ± 14.3 vs 29.4 ± 18.8 units, $p = 0.05$), suggesting later spread of CAV to the microvasculature. As the IMR increased, fractional flow reserve increased(0.86 ± 0.06 to 0.90 ± 0.06 , $p = 0.0035$ comparing recipients with IMRs ≤ 20 to those with IMRs ≥ 40), despite no difference in percentage plaque volume($21.0 \pm 11.2\%$ vs $20.5 \pm 10.5\%$, $p = \text{NS}$). In conclusion, early after HT, anatomic and physiologic evidence of epicardial CAV was found. Later after HT, the physiologic effect of epicardial CAV may be less, because of increased microvascular dysfunction.

心脏移植后冠状动脉解剖和生理的变化

心脏移植血管病变(CAV)是一种进行性过程,涉及心外膜和冠状动脉微血管系统。此二者异常发展的进程以及生理与解剖变化之间的关系尚不明确。在151例

心脏移植 (HT) 后 0 ~ 5 年的无症状移植受者进行冠状动脉造影检查时,采用血管内超声有创性评估冠状动脉左前降支的解剖和生理,并测定血流储备分数、冠状动脉血流储备和微循环阻力指数(IMR)。结果显示无明显 CAV 的冠状动脉造影证据,但是 HT 后第 1 年,血流储备分数显著降低 (从 0.89 ± 0.06 降至 0.85 ± 0.07 , $P = 0.001$),通过血管内超声测定的斑块体积百分比显著增加 (从 $15.6\% \pm 7.7\%$ 增至 $22.5\% \pm 12.3\%$, $P = 0.0002$),表明心外膜生理和解剖存在显著负相关 ($r = -0.58$, $P < 0.0001$)。与 HT 后 ≥ 2 年的患者相比,HT 后 < 1 年患者的 IMR 更低 (24.1 ± 14.3 U vs 29.4 ± 18.8 U, $P = 0.05$) ,提示晚期 CAV 累及至微血管系统。随着 IMR 的增加,血流储备分数也增加 ($IMR \leq 20$ 的患者与 $IMR \geq 40$ 的患者相比,血流储备分数为 0.86 ± 0.06 vs 0.90 ± 0.06 , $P = 0.0035$),尽管斑块体积百分比无显著差异 ($21.0\% \pm 11.2\%$ vs $20.5\% \pm 10.5\%$, P 值无显著性)。总之,HT 后早期,发现有心外膜 CAV 的解剖和生理学证据。HT 后晚期,由于微血管功能异常增加,心外膜 CAV 的生理学作用可能会消失。

0738. Comparison of Multidetector 64-Slice Computed Tomographic Angiography to Coronary Angiography to Assess the Patency of Coronary Artery Bypass Grafts

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This study prospectively evaluated the diagnostic accuracy of 64-slice computed tomographic angiography(CTA) in assessing the patency of coronary artery bypass grafts compared with invasive coronary angiography. In total 147 bypass grafts(100 venous grafts and 47 mammary artery grafts) were evaluated in 50 consecutive patients. Contrast-enhanced 64-slice CTA was performed and compared with invasive angiography. The computed tomographic angiographic scan protocol used 64- \times 0.5-mm slice collimation and 0.33-second gantry rotation time during simultaneous electrocardiographic gating. Patients with a heart rate > 65 beats/min received β blockers. Overall 145 of 147 bypass grafts(98.6%) were detected by CTA; 2 nonvisualized grafts were occluded at the time of invasive angiography. Of the grafts visualized, 28 were totally occluded, 103 were patent, and 14 had significant stenoses that were confirmed by invasive angiography. Ninety-five

percent(111 of 117) of patent grafts demonstrated good run-off distal to anastomoses but without an ability to accurately evaluate the presence of retrograde flow; 83% (97 of 117) of distal anastomoses were adequately evaluated, whereas the remaining 17% (20 of 117) were not well visualized due to vascular clips and/or calcification artifacts. Two grafts were not demonstrated by invasive angiography but were detected by CTA and found to be widely patent. In conclusion, multidetector 64-slice CTA is a valuable tool for direct visualization of coronary bypass grafts and assessment of their patency. Dysfunctional bypass grafts can be detected with high diagnostic accuracy.

多探头 64 层 CT 血管造影与冠状动脉造影评估冠状动脉搭桥术血管桥开放状态的比较

本研究前瞻性评估了 64 层 CT 血管造影 (CTA) 与有创性冠状动脉造影对冠状动脉搭桥术血管桥开放状态的诊断准确性。共评估 50 例连续入院患者的 147 支血管桥 (100 支静脉血管桥和 47 支乳内动脉血管桥)。采用造影剂增强 64 层 CTA,并与有创性冠状动脉造影进行比较。在同步心电门控过程中,CTA 扫描采用 64×0.5 mm 层面准直和 0.33 s 机架旋转时间。心率 > 65 次/min 的患者接受 β 受体阻断剂治疗。147 支血管桥中共有 145 支血管桥(98.6%)成功接受 CTA 检查。2 支不显影的血管桥在行有创性冠状动脉造影时发现闭塞。可显影的血管桥中,经有创性冠状动脉造影发现有 28 支完全闭塞,103 支开放,14 支显著狭窄。117 支开放的血管桥中有 111 支(95%)被证实吻合处远端流出道良好,但不能准确评估有无逆向血流;有 97 支(83%)可以充分评估远端吻合处,其余 20 支(17%)由于血管夹和(或)钙化伪影而显影不佳。有两支血管桥有创性冠状动脉造影术不能辨别,而 CTA 可显影并发现其开放良好。总之,多探头 64 层 CTA 是一种直接对冠状动脉血管桥显影并评估其开放状态的有效工具。利用其识别血管桥功能障碍具有极高的诊断准确性。

0739. Usefulness and Safety of Transcatheter Ablation of Atrial Fibrillation in Patients With Hypertrophic Cardiomyopathy

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Atrial fibrillation(AF) is common in patients with hypertrophic cardiomyopathy(HC) and predicts adverse outcome. Radiofrequency catheter ablation(RFCA) represents a potentially advantageous alternative to lifelong pharma-