2019 FEASIBILITY AND EFFICACY OF SPECT MYOCARDIAL PERFUSION IMAGING USING A SCANNING Gd-153 SOUCE FOR ATTENUATION CORRECTION: RESULTS OF A PILOT TRIAL

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Photon attenuation is responsible for artifact production (diaphragm, breast) in many pts undergoing SPECT myocardial perfusion imaging. The current study employed a method of attenuation correction (AC) by use of a collimated, electronically-shuttered line source of Gd-153, allowing for the simultaneous collection of emission (E) and transmission (T) data with a 90° dual detector camera (Vertex™, ADAC Labs). A comparison of E and AC images was performed in 41 pts, with blinded and unblinded image interpretation. Separately acquired E images were similar to E data obtained simultaneously during T scan. Unblinded interpretation of the E and AC images revealed perfusion defect improvement in 63% of pts, 8% of segments; complete normalization occured in 23 of these 26 pts. Therefore, this technique for AC appears to be allow for the acquisition of an emission image undistorted by a simultaneous T scan. The improvement of defects presumed to be artifacts by AC, suggests this method may be clinically valuable.

2020 A study of basic properties of scintillation ganma camera using a pinhole collimator.

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A pinhole SPECT was reconstructed using a modified cone-beam algorithm developed for Toshiba ganma camera (GCA-901A/HG). Basic studies such as sensitivity and resolution and uniformity were investigated at 2mm, 3.3mm, 4.8mm and 6.9mm pinhole aperture. Measeament of sensitivity was made by changing a distance of disk source containing 111MBq of ^{99m}Tc along the axis. A spatial resolution was measured using three capillary tubes line source with 37MBq of ^{99m}Tc. Myocardial imagings of rats were obtained with ^{123}I-MIBG and ^{201}Tl. Clear infarction imaging of rat was observed in myocardial SPECT in vivo using a pinhole SPECT.

2021 Comparison of Cationic Myocardial Perfusion Agents by Using Cultured Smooth Muscle Cells

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The uptake and washout kinetics of two cationic lipophilic Tc-99m-labeled myocardial perfusion agents, Tc-99m-MIBI and Tc-99m-Tetrofosmin, were studied in cultured smooth muscle cells and compared to Tl-201. Both Tc-99m-MIBI and Tc-99m-Tetrofosmin had a 4-fold greater net accumulation than Tl-201, and they were washed out of cells through similar kinetics which had slower rates than Tl-201. Incubation with metabolic inhibitors had a modest influence on the uptake of these two Tc-99m-labeled agents, although their extents were different. Ion transport inhibitors did not affect the uptake of Tc-99m-MIBI, although the Tc-99m-Tetrofosmin uptake was slightly inhibited when the Na^++K^++2Cl^- transport system or the Ca^{2+} channel were blocked. Our studies indicate that Tc-99m-MIBI and Tc-99m-Tetrofosmin were taken up by smooth muscle cells under similar pharmacokinetic patterns, but their accumulation reflected a different meaning for cell viability.

2022 Isosobide dinitrate(ISDN)intervention in myocardial perfusion imaging to evaluate myocardial viability

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12cases had been studied.4cases of old infarction were demonstrated by coronary angiography.8 segments of them had defect and abnormal wall viable studies.8 cases of CAD and infarction had 15 segments radioactive defect.10 segments showed perfusion improvement after giving ISDN.After PTCA,99m-Tc-MIBI imaging showed perfusion improvement in 8 segments.Both coincident rate was 80%

This results suggest this method is very useful for evaluating myocardial viability.

2023 Quantitative Analysis of Tc-99m MIBI SPECT during Isosorbide Dinitrate Infusion in Assessment of Viable Myocardium: Compared to post-CABG Imaging

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Isosorbide dinitrate (ISDN) can significantly increase the uptake of Tc-99m MIBI in hypoperfusion area. 17 patients were studied. The uptake fo MIBI was quantified from circumferential profiles. The abnormality was identified as < 80%. After ISDN, the uptake increased from 60.3 ± 17.7% to 69.2 ± 16.9%, $p<0.01$. The perfusion was improved in 42 segments(seg) (61.9 ± 10.4% vs 73.4 ± 10.1%). After CABG, the uptake increased from 60.3 ± 17.7% to 68.6 ± 18.4%, $p<0.01$, The perfusion was improved in 45 seg (61.2 ± 10.0% vs 75.4 ± 11.3%). The wall motion (MW) was improved in 40 seg post-CABG, perfusion was also improved in 32 seg after ISDN. The accuracy of ISDN for detecting viable myocardium was 82.9%. In conclusion: ISDN infusion Tc-99m MIBI SPECT is valuable in assessing viable myocardium after myocardial infarction.

2024 Dual Isotope Rest Tl-201/Stress Tc-99m Myocardial Perfusion Scintigraphy Permits Differentiation of Myocardial Ischemia from Soft Tissue Attenuation Artifact.

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To determine whether the relative distribution of regional activity derived from perfusion agents with differing energies would differentiate true perfusion defects from attenuation artifacts, maximal count circumferential profiles and count *difference* polar maps were compared in 23 patients with angiographically confirmed CAD and 42 patients with a low CAD likelihood. In normal studies, differential radioactivity was well matched, with extensive areas of Tc-99m excess. Regions of Thallium-201 excess were limited in extent. Tc-99m excess was significantly greater in the right coronary distribution of males vs. females suggesting attenuation artifact. Patients with CAD had greater Tl-201 excess than normal values ($p<0.0005$) in 81% of angiographically involved areas. Analysis of maximal count circumferential profiles and Tl-201/Tc-99m *difference* polar maps permit the differentiation of perfusion abnormality from artifact caused by soft tissue attenuation.

Presented by Medical*Online