monoclonal antibody, Leucoscan, is an IgG murine Fab' fragment directed against an NCA-90 epitope located on the surface of granulocytes.

Methods:45 patients with suspected bone and joint infection (18 total hip prosthesis, 4 knee prosthesis, 8 vertebral infection and 15 long bones) were included in this study. All patients underwent conventional Rx, bone scan, 67 Ga scan and Leucoscan. Three phase 99mTc MDP bone scan and 67 Ga scan were performed using standard procedures.

For Leucoscan the antibody was labeled with 25 mCi of 99mTc and was injected intravenously over 30 seconds. Ten minutes planar images were taken 1h and 2 hrs p.i using a GE Millennium γ camera provided with a LEGP collimator. Images were evaluated as score 1 (no abnormal uptake), score2 (probably positive), score 3 (definitely infected) according the intensity of abnormally increased uptake. Results were compared with 99mTc MDP bone scan and 67Ga scans. The final diagnosis was given by the surgical verification with histopathology or culture.

Results :All 45 patients had pathologic proof of presence/ absence of bone and joint infection. 36/45 were positive for bone or joint infection and 9/45 were negative.30/36 patients with surgically proven bone and joint infection had true positive Leucoscan, 26/36 had true positive MDP bone scan and 20/36 true positive 67Ga scan.

Nine out of 9 patients with proven absence of inflammation had true negative Leucoscan, five of them had true negative MDP scan and 6/9 had true negative 67 Ga scan.

The sensitivity, specificity and accuracy for Leucoscan was 84%,100% and 86% respectively in comparison with MDP bone scan and 67Ga scan which was 75%, 55% and 68% and 61%,75% and 63% respectively.

Conclusion These preliminary results could demonstrate that monoclonal antibody labeled granulocytes scan, such as Leucoscan, have higher sensitivity, specificity and accuracy than bone scan and 67Ga scan, with superior image quality and more accurate lesion localization.

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AT0200411   **17.9**

Improving the Accuracy of Myocardial Perfusion Scintigraphy Results by Machine Learning Method

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Objective
Machine learning (ML) as rapidly growing artificial intelligence subfield has already proven in last decade to be a useful tool in many fields of decision making, also in some fields of medicine. Its decision accuracy usually exceeds the human one.

Aim
To assess applicability of ML in interpretation the results of stress myocardial perfusion scintigraphy for CAD diagnosis.

Patients and methods
The 327 patient's data of planar stress myocardial perfusion scintigraphy were reevaluated in usual way. Comparing them with the results of coronary angiography the sensitivity, specificity and accuracy for the investigation was computed.

The data were digitized and the decision procedure repeated by ML program "Naive Bayesian classifier". As the ML is able to simultaneously manipulate of whatever number of data, all reachable disease connected data (regarding history, habitus, risk factors, stress results) were added. The sensitivity, specificity and accuracy for scintigraphy were expressed in this way. The results of both decision procedures were compared.

Results

Stress myocardial perfusion planar scintigraphy	Sensitivity	Specificity	Accuracy
Standard decision	86	85	86
ML decision	92	87	91,5

Conclusion

With ML method 19 patients more out of 327 (5.8%) were correctly diagnosed by stress myocardial perfusion scintigraphy. ML could be an important tool for decision making in myocardial perfusion scintigraphy.