	SPA	QCT	QCT-A	DPA	DPA-X
Site	Radius, heel	Spine	Spine, hip	Spine, hip, TB	Spine, hip, TB
Sensitivity	.5–1X	2–3X	2–3X	1X	1X
Precision	1–2%	2–5X	1–2%	2–4%	1%
Accuracy	5%	5–15%	5–10%	4–10%	3–6%
Time	15 min	15 min	10 min	40 min	5 min
Radiation	10 mrem	100–500 mrem	100–200 mrem	5 mrem	5 mrem
Cost	$50–75	$100–200	$100	$100–150	$75

can measure sites in the central skeleton. Quantitative computed tomography (QCT) provides a measure of purely trabecular bone of the vertebral spongiosum or other sites, while dual photon absorptiometry (DPA) measures an integral of compact and cancellous bone of the spine, hip or total body (TB). Recent software and hardware advances in QCT have substantially improved performance characteristics by controlling technical parameters and automating the procedure (QCT-A). Recent developments in DPA with the use of a dual-energy X-ray source in place of an isotope and improvements in detector configuration have greatly enhanced the speed and precision of this X-ray-based technique (DPA-X). The performance characteristics of these techniques are presented below.

A consensus has not yet been developed on which method or methods are most efficacious for diagnosing and monitoring of the individual patient or for extensive screening of large populations. In this review the relative merits of each technique will be discussed from the technical and clinical perspectives, and the indications for their use will be presented.

《招待講演 (6)》

Radiolabeled Antimyosin Antibody as a Tool for Evaluation of Myocardial Damage

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The usefulness of radiolabeled anticardiac myosin antibodies has been demonstrated in the detection of myocardial necrosis. It is reasoned that cell membrane integrity is disrupted after myocardial injury and this permits the entry of the antibodies that then bind cardiac myosin, the most abundant and highly insoluble myocardial protein in myocardial cells.

Initially it was developed as a method for identifying irreversibly necrotic myocardium in myocardial infarction. Experimental studies demonstrated an inverse relationship between regional myocardial blood flow and the uptake of the tracer even in areas of low blood flow. Antimyosin was labeled with either Tc-99m or In-111 for scintigraphic agents. When the Fab fragments of antibodies are used, immunogenecity can be reduced and blood clearance is shortened. Clinical studies have shown that the preparation is well tolerated with acceptable radiation dose for scintigraphy. Recently it's efficacy in the diagnosis of myocarditis and human cardiac transplant rejection has been advocated.

We have recently reported the usefulness of monoclonal antimyosin antibodies in the quantitative assessment of myocardial necrosis. In our experimental canine model, we compared the myocardial uptake of In-111 antimyosin antibody in

control group with that in verapamil treated group. Myocardial necrosis was produced in our experimental canine by 1 hour occlusion of the left anterior descending coronary artery followed by 90 minutes of reperfusion. In myocardial segments with flow reduction of 0 to 10% of normal, relative In-111 antimyosin uptake was 16.3±1.4 in the control group but it was reduced significantly to 5.7±0.6 in the verapamil treated group. There was also significant difference in In-111 antimyosin antibody uptake between the control group (7.3± 0.8) and the verapamil treated group (3.9±0.7) in regions with 11 to 30% reduction. So we could demonstrate the protective effect of verapamil on myocardium in coronary reperfusion following myocardial infarction using this antibody.

We also applied this to the detection of doxorubicin cardiotoxicity. After injection of doxorubicin, myocardial uptake of In-111 antimyosin and Tc-99m pyrophosphate were measured in 12 controls and 10 doxorubicin treated rabbits. In-111 antimyosin uptake in myocardium correlated well with the degree of pathology (r=0.95). The uptake ratio (expressed as percent injected dose per gram myocardium) of doxorubicin treated vs. control animals was 2.7: 1 for In-111 antimyosin antibody.

From these results, we suggest that In-111 antimyosin antibody is a potential agent as a probe for evaluation and detection of myocardial damage.