INTRODUCTION AND AIM OF THE WORK

INTRODUCTION

Differentiation of benign from malignant hepatic lesions is a frequent diagnostic problem. This differentiation has important treatment implications in patients who have or suspected of having cancer or in patients with lesions detected incidentally. ***(Katsuyoshi, et al., 1997)***

The role of different imaging modalities is vital not only in the detection of such lesions, but also characterization of them. The availability of the new different imaging technique promises great hope in characterizing these lesions and on the other hand, creates a sort of confusion in selecting the best diagnostic tool. Till the moment, there is no gold standard mean of diagnosis of such lesion. However, the combination of more than one technique may offer a precise diagnosis and save other invasive diagnostic tools. ***(Takayama, et al., 1990; Cameron, et al., 1993; Ferrel, et al., 1992).***

MR imaging represents a powerful imaging tool, with its high inherent soft tissue contrast resolution, technical versatility for sequence selection and modification, provision of biochemical as well as anatomic information, multiplaner imaging, intrinsic sensitivity to blood flow and blood breakdown products, as well as lack of ionizing radiation. ***(Mark R, et al., 1997)***

MR imaging has taken longer to find its role in liver imaging and has been regarded more as a problem-solving technique, to be used when

CT and US are unable to provide a complete answer to particular clinical problem or when alternative imaging is contraindicated. ***(Mark R, et al., 1997)***

MR imaging which has a high degree of specificity for characterizing hepatic tumors, is taking an important place in clinical practice for the examination of patients with such tumors. ***(Philippe, et al., 1997)***

During the past 5 years, multiple techniques have been developed for MR imaging of the liver. Optimization of pulse sequences is a critical issue in MR imaging of the liver as image quality and diagnostic value greatly depend on imaging protocol. ***(Philippe, at al., 1997)***

Newly developed MR imaging sequences have been tested with the two major goals of decreasing motion artifacts and increasing intrinsic liver-to-lesion contrast. ***(Reining JW, 1995; Rydberg JN, 1995)***

Unenhanced T_2 weighted MR images obtained at high field strengths, remain important in routine practice for detection of hepatic tumors. ***(Reining JW, 1989)***

To overcome the limitations of conventional spine-echo technique (long acquisition time, image degradation due to motion artifacts, and decreased signal-to-noise ratio), fast spin-echo imaging has been proposed to obtain efficient T_2-weighted images. ***(Catasca JV, 1994; Outwater, 1994)***

In addition, breath-hold techniques have been used to obtain T_2-weighted images of the liver, and these techniques provided excellent contrast-to-noise ratios, with a shorter imaging time than that needed with conventional T_2-weighted spine-echo images. However, the applications to liver imaging of these new sequences are still limited and their true sensitivities for tumor detection have not yet been reported. ***(Rydberg, 1995; Taupi TZ)***

Some investigators have reported that heavily T_2-weighted conventional spine-echo (SE) MR images can be used to distinguish non solid benign lesions (hemangiomas or cysts) from malignant tumors, but others have advocated the acquisition of gadolinium-enhanced images for accurate discrimination. ***(Mcfarland, 1994; Itoh, 1990)***

Fast SE MR imaging techniques have largely replaced T_2-weighted conventional SE techniques for most abdominal applications. The use of a fast SE sequence can potentially result in the faster acquisition of heavily T_2-weighted images than a conventional SE sequence can. ***(Outwater EK, 1994)***

Additionally the differences in signal intensity between solid and non solid lesions are greater on fast SE images than on conventional SE images, probably because of the greater magnetization-transfer contrast. ***(Wittenberg J, 1988)***

If heavily T_2-weighted fast SE images could be used for differentiation of benign from malignant lesions in lieu of heavily T_2-weighted conventional SE or gadolinium-enhanced images, important time and financial saving would be possible in MR imaging of liver. ***(Katsugoshi Ito, 1997; Whitrey WS, 1993)***