SUMMARY

This thesis included the study of the role of magnetic resonance imaging (MRI) examination in the detection and characterization of malignant tumors of the breast.

The review of literature enclosed the anatomical background of the breast as well as the pathologic bases of the benign and malignant breast tumors. The indications of MRI examination of the breast and the MRI appearance of malignant breast tumors were also revised.

The practical work included the MRI examination of 20 cases, presenting with breast lesions suspicious for malignancy using double breast coil. The examination protocol included the rapid dynamic imaging within the first ten minutes after I.V. injection of gadolinum contrast agent.

The MRI examination was preceded by clinical evaluation of the cases as well as mammographic and sonographic examination.

The results of this study showed the value of MRI in increasing detectability of malignant breast lesions especially in cases of mammographically dense breasts and recurrent breast tumors as well as the detection of multicentrcity and breast tumors located near the chest wall. The thesis showed also the value of delayed imaging after gadolinium injection in differentiation between benign and malignant breast tumors on the basis of different morphological and quantitative signs.

CONCLUSION

From the results of our study we can conclude the following:

1. MR imaging of the breast can be used as a problem-solving method whenever conventional modalities are equivocal. Conventional imaging modalities remain the method of choice for screening programs and as the first imaging aid to the clinical examination when breast malignancy is to be excluded.
2. Compared to mammography, MR imaging has high sensitivity (93%) specificity (86%) and accuracy (90%) in comparison to mammographically problematic cases in which the sensitivity, specificity, and accuracy are (71%), (83%), and (75%) respectively.
3. Absence of enhancement on MR examination totally excludes malignancy if clinical, mammographic and sonographic examinations are equivocal, except if suspicious microcalcifications are present on mammography.
4. The morphological signs of malignancy are peripheral enhancement of the lesion, irregular border of the lesion whether stellate or non-stellate, early enhancement, and early washout and type III time / signal intensity curve.
5. All morphological criteria are to be used in the interpretation of an enhancing lesions as benign lesions could also show early enhancement.
6. Quantitatively, benign and malignant breast lesions can be differentiated by the slope of the time-intensity curves on the delayed images (10 min), benign lesions show plateau-like curve, while the malignant lesions show steep decline.
7. Both qualitative and quantitative methods are needed for evaluation of lesions.

8. The double breast coil is preferred to the single one for detection of bilateral lesions.
9. Total coverage of the whole breast is essential to exclude multicentric involvement.
10. Based on our results, we think that MR imaging of the breast is indicated in the following cases:
    A- Detection of suspected malignancy in a breast with dense parenchymal tissue. This situation is encountered in young women below thirty years and elderly women under replacement therapy.
    B- Characterization of indeterminate lesions by mammography and ultrasonography.
    C- Detection of recurrence in the residual breast parenchyma after breast-conserving surgery.
    D- Detection of suspected chest wall involvement in cases of malignant breast lesions near the chest wall and detection of recurrent malignant nodules after total mastectomy.
    E- Exclusion of bilaterality prior to surgical procedure.
    F- For exclusion of multicentricity and exact determination of the tumor size, if conservative surgery is contemplated.
    G- Detection of malignant breast lesions in patients with free mammographic and sonographic examination, in whom the axilla is involved by suspected malignant lymph nodes.