

TITLE: Soft tissue masses that are hypointense to muscle on T1W and hyperintense on fluid sensitive MRI sequences

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ABSTRACT:

Purpose: To assess the reliability of MRI features in distinguishing between benign and malignant masses that are hypointense to muscle on T1-weighted and hyperintense on fluid sensitive MRI sequences.

Materials and methods: MR images of 42 patients with histologically proven masses (29 benign and 13 malignant) were retrospectively reviewed in 24 females and 18 males (mean age, 53 years; age range, 23-82 years). Images were assessed for:

- 1) degree of homogeneity of the lesion (i.e., whether it was homogeneous or heterogeneous) was determined on both T1- and T2-weighted / STIR images,
 - 2) The dimensions of the mass in all 3 planes (craniocaudal, anteroposterior and transverse),
 - 3) presence or absence of lobulation,
 - 4) depth in relation to the superficial fascia,
 - 5) margin type (well-defined or poorly defined).
- Wilcoxon test was used for continuous variables and the Chi-squared test for categorized variables to calculate statistical significance. A P value of 0.05 or less was considered to indicate a statistically significant difference.

Results: The statistically significant MRI predictors of malignancy were: Average of the dimensions of the mass in the 3 planes with malignant lesions (mean of 7.2 cm range of 2.3 to 17 cm) larger than benign lesions (mean of 4.01 cm and range of 2.3 to 7.3 cm) with $P = 0.005$. Increased greatest dimension of the mass also favoured malignancy and was statistically significant ($P = 0.043$), but this significance is less than that for the average dimension of the mass.

The heterogeneity of the mass on T1-weighted sequence favoured malignancy ($P = 0.011$).

Age & sex of the patient, lobulation, heterogeneity on T2-weighted sequences, margin type, and depth in relation to superficial fascia were not statistically different between the benign and malignant masses.

Conclusion: The heterogeneity of lesions on T1-weighted sequences and larger dimensions of the mass are features that may be helpful in differentiating benign from malignant soft tissue masses that are hypointense to muscle on T1-weighted and hyperintense on fluid sensitive MRI sequences.