

IS MRI CONTRAST NECESSARY IN THE WORKFLOW OF SCANNING ADIPOCYTIC TUMORS?

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Abstract

Aim: To determine whether eliminating post-contrast sequences can achieve the same diagnostic outcome at identifying atypical features of adipocytic tumors.

Materials and method: 47 cases (including control cases) were reviewed by two radiologists specialized in musculoskeletal radiology who were asked to omit the post-contrast sequences and identify the cases with atypical features. Results are compared with clinical notes on electronic patient record (ePR).

Results: Both radiologists identified 100% of the cases with atypical features without the post-contrast sequences

Conclusion: Post-contrast sequences do not improve sensitivity in identifying atypical features of superficial adipocytic tumors.

Introduction

Fat-containing tumors are commonly encountered in our routine diagnostic services, especially at our hospital (Queen Mary Hospital, Hong Kong) where musculoskeletal oncology services are provided.

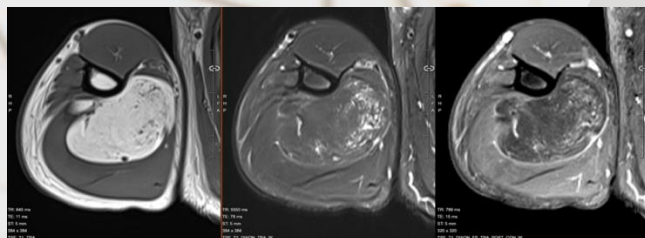
The following imaging features are associated with malignant histological features:

- Largest length over 10 cm for superficial lesions; over 5 cm for deep lesions 1.
- Mediastinal, retroperitoneal, intra-abdominal, pelvic or spermatic cord origin 1.
- Intralesional non-fat signals¹; coexistence of fatty and solid areas; intralesional calcifications 2.
- Presence of thick septa (>2mm) or irregular or nodular septa with marked enhancement 3.
- Significant increase in size over time by either clinical or radiological examinations.
- Involvement of adjacent organs including cortical bone erosion.

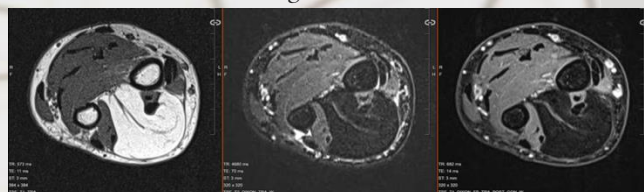
Most atypical features listed above could be identified without post-contrast sequence apart from “marked enhancement of septa after contrast injection” which is rather subjective and often accompanied by considerably thickened septa as prerequisite.

References:

- 1 Kransdorf MJ, Bancroft LW, Peterson JJ, Murphy MD, Foster WC, Temple HT. Imaging of fatty tumors: distinction of lipoma and well-differentiated liposarcoma. *Radiology*. Jul 2002.
- 2 Murphy MD, Carr oll JF, Flemming DJ, Pope TL, Gannon FH, Kransdorf MJ. From the archives of the AFIP: benign musculoskeletal lipomatous lesion. *Radiographics*. Sep 2004.



From left to right: T1 sequence; T2 DIXON water only sequence and T1 DIXON water only post-contrast sequence. Intramuscular lipomatous lesion within triceps muscle. T2 hyperintense non-fat suppressed components are identical to enhancing territories.



Thickened septum within the intramuscular lipomatous lesion looks identical on T2 and post-contrast sequences.

Materials and method

A total of 47 cases were included in this study. In which 25 of these cases had atypical features apart from size mentioned in the report. Two radiologists with more than 1 year of musculoskeletal radiology experience were given the images of these 45 cases and were instructed to only review the T1 and T2 DIXON water only sequences. They were asked to determine whether the tumors have atypical features or not. The lists prepared by the two radiologists were 100% coherent, meaning the same diagnostic outcome was achieved without the post-contrast images.

Conclusion

In index MRI scans for subcutaneous and intramuscular lipomatous lesions, T2 fat suppressed images are sufficient for identifying atypical features. Additional post-contrast sequences do not improve sensitivity in identifying atypical features.

Discussions

Findings of this study were conveyed to orthopedic surgeons. Case examples were shown. Suggestion of booking non-contrast MRI scans for workup of superficial lipomatous lesion was welcomed. MRI radiographers were also informed of the new workflow.

3 Ohguri T, Aoki T, Hsuoka M, et al. Differential diagnosis of benign peripheral lipoma from well-differentiated liposarcoma on MR imaging: is comparison of margins and internal characteristics useful? *AJR Am J Roentgenology*. Jun 2003.