

Utility of Core Needle Rebiopsy of Initially Non-diagnostic Musculoskeletal Lesions

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Introduction/Problem

Biopsy of musculoskeletal lesions allows for histologic diagnosis, guiding medical and surgical management. Open surgical biopsy is considered the gold standard for diagnosis; however, image guided core needle biopsy (CNB) is often performed first due to its minimally invasive nature, decreased recovery time, lower cost, and lower complication rate.

Although non-diagnostic CNB results can be useful; in cases suspicious for malignancy, a definitive histologic diagnosis is often still needed. This can be accomplished by a surgical biopsy or a repeat CNB.

Repeat core needle biopsy has been shown to be useful in other body parts including the breast and kidney. It is unclear whether this is true for musculoskeletal lesions.

Aim/Goal

The purpose of this study is to assess the utility of repeat core needle biopsy following an initially non-diagnostic CNB.

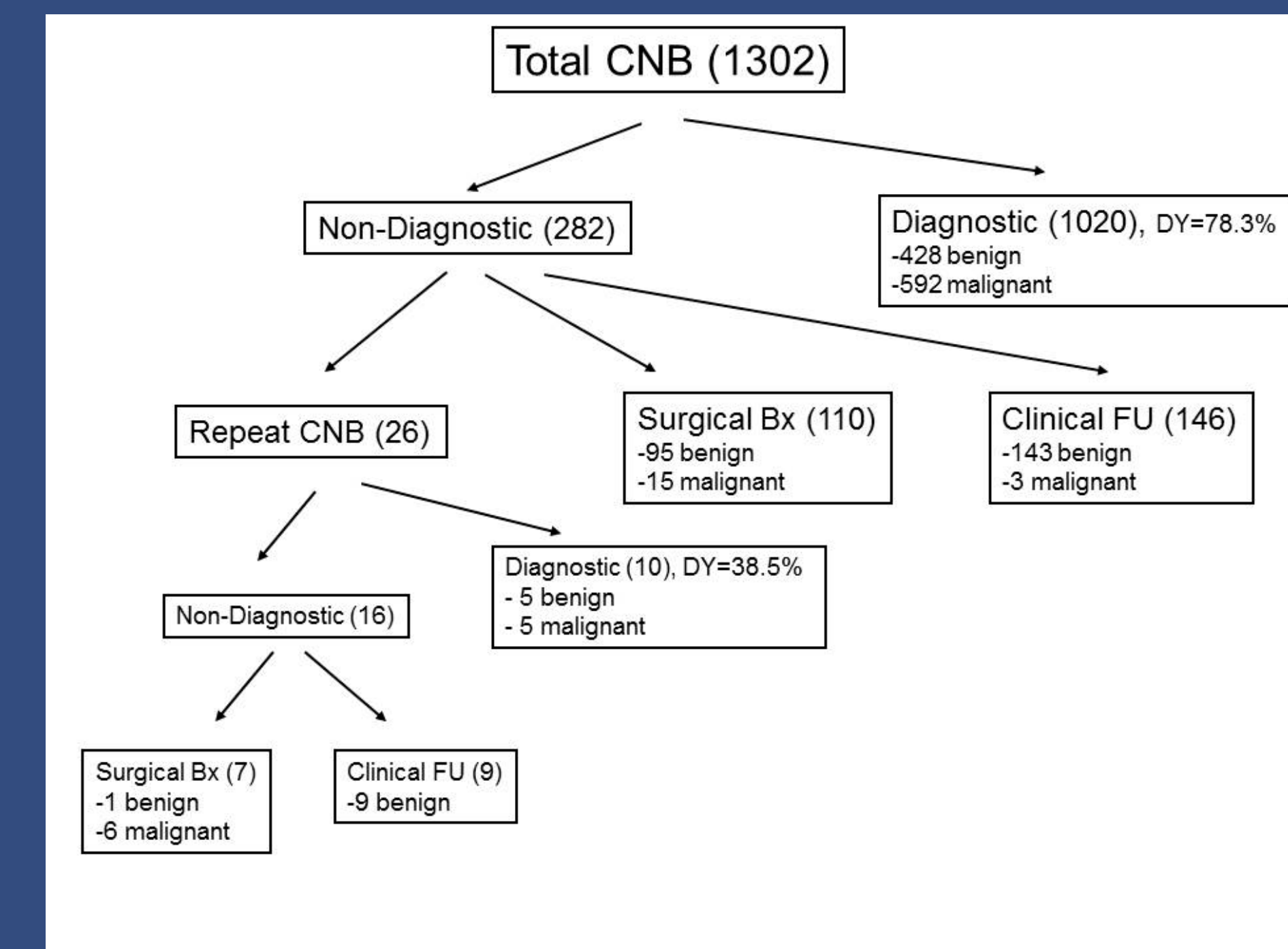
The Team

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The Interventions

- A retrospective review was conducted in 1302 consecutive core needle biopsy examinations performed on bone or soft tissue lesions at a tertiary academic center between June 2004 and September 2014. Biopsies were performed on indeterminate or suspicious musculoskeletal lesions requiring a pathologic tissue diagnosis. Cases in which a repeat biopsy of the same lesion was requested by the referring physician due to non-diagnostic biopsy results were included in the study (n=26). Exclusion criteria included those cases in which an alternative lesion was biopsied at time of the second image-guided biopsy procedure, as well as pediatric and vertebral body cases as these are not performed by our musculoskeletal radiology service. This retrospective study was approved by our institutional review board with waiver of requirement for informed patient consent.

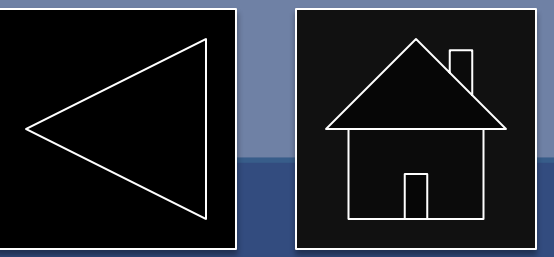
Results/Progress to Date



CNB-core needle biopsy, Bx-biopsy, FU-followup, DY-diagnostic yield

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More Results/Progress to Date

Lesion type	Number	Diagnostic on Rebiopsy
Metastatic carcinoma	3	2 (66%)
Lymphoma	2	1 (50%)
Ewing sarcoma	2	1 (50%)
High grade sarcoma	2	1 (50%)
Malignant peripheral nerve sheath tumor	1	0 (0%)
Chondrosarcoma	1	0 (0%)

	# of cases	Diagnostic yield	p-value (Chi ²)
Increased number of passes	13 (50.0%)	61.5%	0.047*
Modality change	3 (11.5%)	33.3%	0.738
Biopsy needle upsize	4 (15.4%)	75.0%	0.150
Different radiologist	18 (69.2%)	50.0%	0.234
Different area of lesion biopsied	13 (50.0%)	46.2%	0.691

Summary of malignant lesions undergoing repeat CNB

Effects of changes in technical factors on diagnostic yield at rebiopsy

Lesion type	Number	Diagnostic on Rebiopsy
Osteomyelitis/sacroiliitis	3	1 (33%)
Paget disease	2	2 (100%)
Stress fracture	2	0 (0%)
Ossifying fibroxanthoma	1	1 (100%)
Solitary fibrous tumor	1	1 (100%)
Eosinophilic granulomatosis	1	0 (0%)
Atypical histiocytoid	1	0 (0%)
Unknown	3	0 (0%)

Lessons Learned

- We evaluated the musculoskeletal core needle biopsy database of a large academic university based medical center over a 10-year period to determine the utility of repeat CNB of musculoskeletal lesions that were initially non-diagnostic. Our results demonstrate that rebiopsy of such lesions is low but can result in a diagnostic biopsy in 38.5% of cases. Thus, rebiopsy may be underutilized.

Next Steps

- Repeat biopsies were requested in only 9.2% (26/282) of initially non-diagnostic biopsies. This finding is similar to those published by other tertiary care orthopedic oncology referral centers.
- Potentially, requests for repeat core needle biopsy of initially non-diagnostic lesions may be underutilized by referring physicians. Knowledge of the accuracy and expected diagnostic yields of lesions may be helpful in selecting which cases to rebiopsy.

Summary of benign lesions undergoing repeat CNB

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