18-6224 False Positive Lesions on MRI Fusion Prostate Needle Biopsy and Inflammation

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Introduction

Inflammation is known to mimic prostate cancer lesions on MRI, for example chronic prostatitis or nodules following BCG treatment.
However, it is unknown how commonly inflammation plays a role in MRI Fusion Ultrasound-Guided (MRI-US) prostate needle biopsies. We investigate inflammation identified on pathology reports from recent UroNav MRI Fusion prostate biopsy patients.

Methods

- We retrospectively identified 43 men with 62 MRI lesions noted on prostate MRI prior to MRI-US fusion prostate biopsy
- We utilized the UroNav system from Invivo (Gainesville, FL)
- Men underwent 3T MRI with Siemens TIM MRI system and lesions were identified and marked with the DynaCAD system.
- MRI fusion was performed with standard MRI fusion techniques: scanning and segmentation prior to prostate biopsy attempt
- The target lesions were performed prior to standard 12-core needle biopsy
- A target lesion was biopsied 3 times (2 sagittal and 1 transverse views) if only one lesion was present and, if there was more than one lesion, 2 cores were taken of each lesion
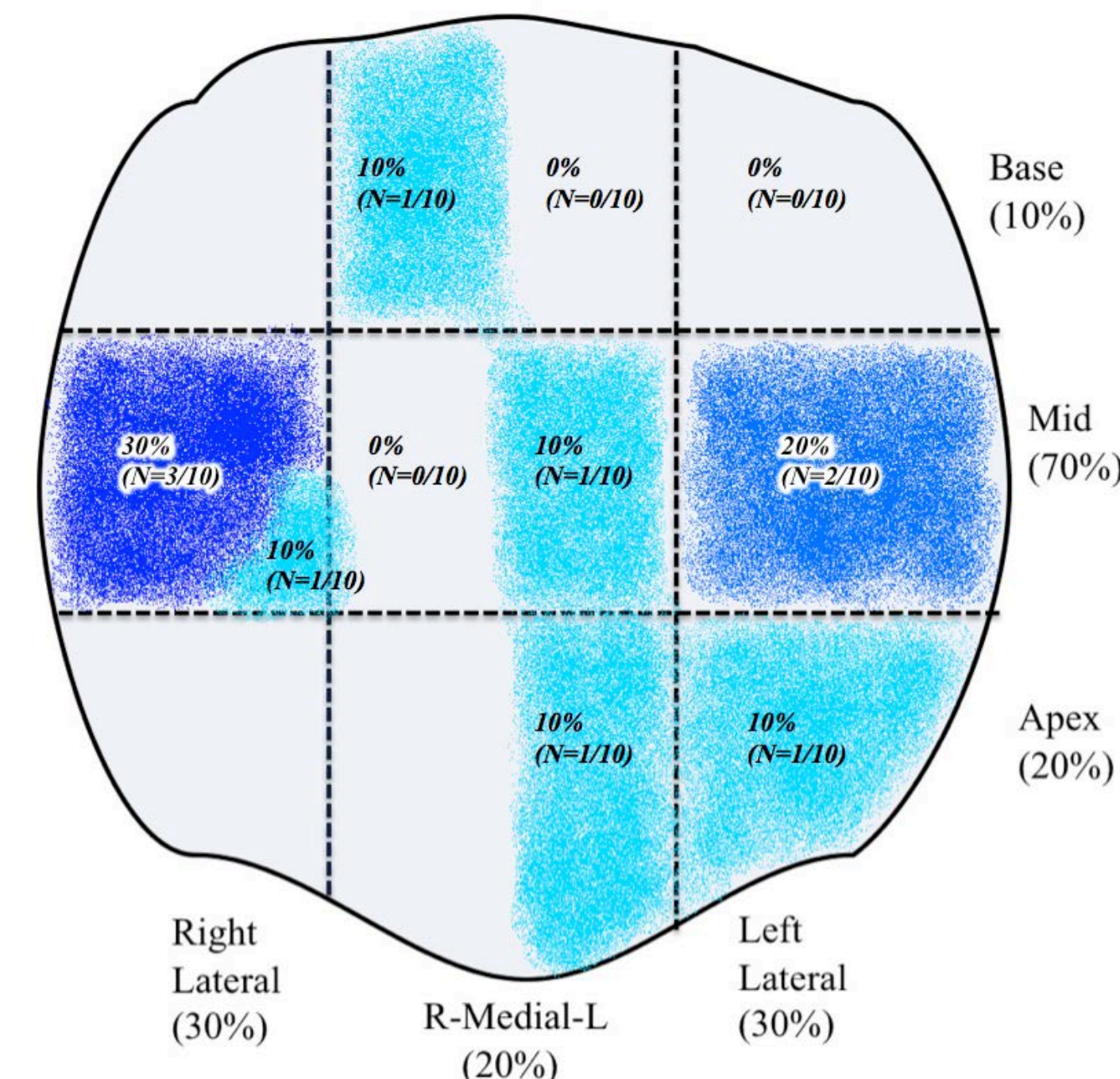- Pathology was retrospectively reviewed for inflammation

Figure 1: False Positive Lesions on MRI-Ultrasound Prostate Needle Biopsy and Proportion of Inflammation on Pathology
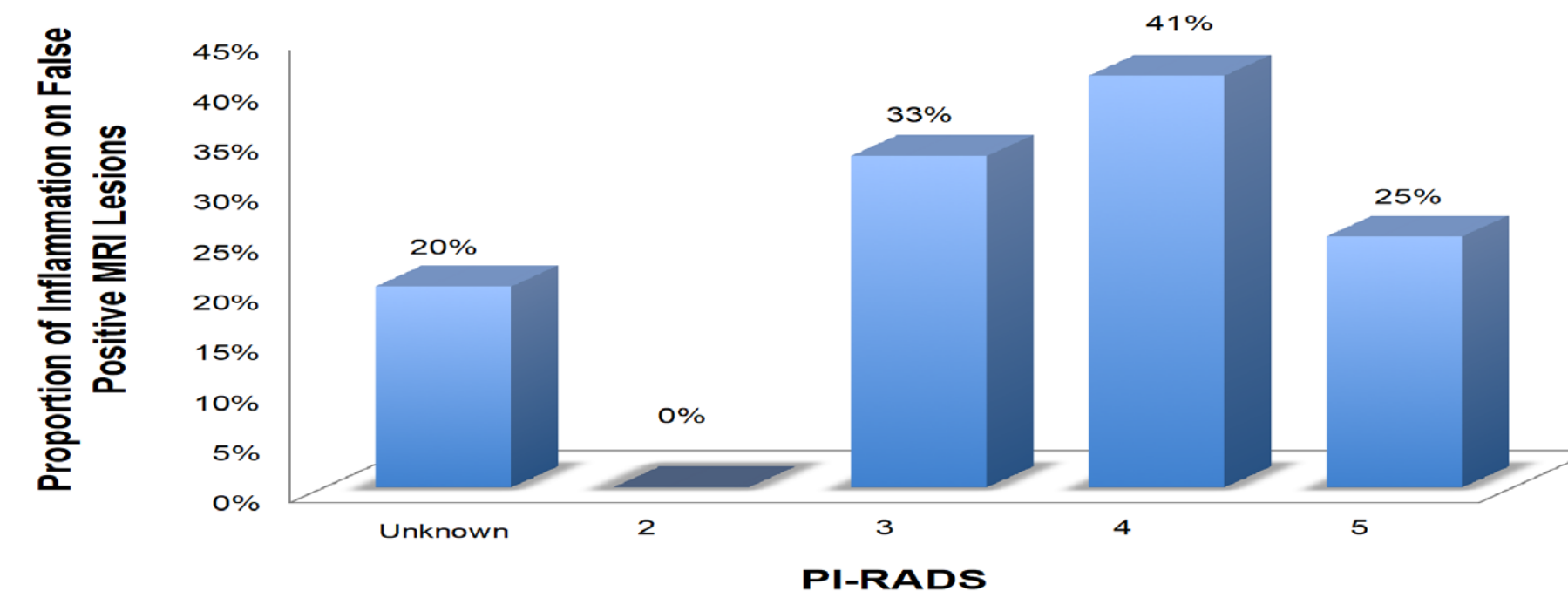
Figure 2: Proportion of False Positives Based on Location
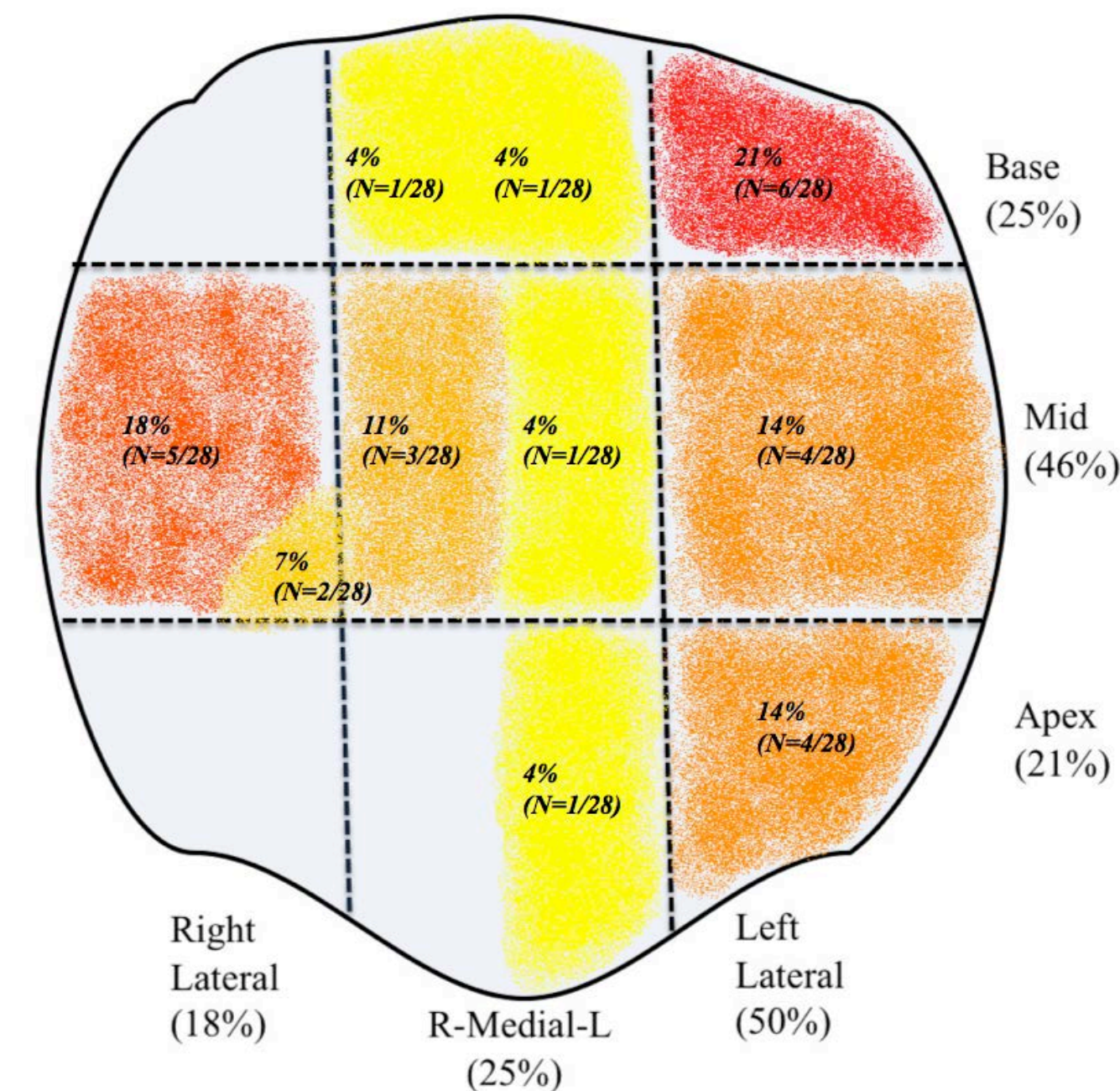
Figure 3: Proportion of Inflammation in False Positives Based on Location

Results

- A total of 32 (52%) false positive lesions were noted
- 22 having no cancer on any cores
- 10 subjects with cancer noted on systematic biopsy but not in the target region
- Of the men with cancer, only 1 of the false positive lesions had inflammation in the location of the targeted region of interest (10%, 1/10)
- 22 men with an identified lesion on MRI with negative pathology in all cores (no prostate cancer identified), 54% had inflammation on prostate biopsy pathology (12/22, p=0.024).
- Figure 1 displays the proportion of false positive targets and corresponding PI-RADS scores
- The highest proportion of inflammation was noted on PIRADS 4 (41%) and 3 (33%) lesions
- Figures 2 and 3 demonstrate proportion of false positives based on location and inflammation

Conclusions

- Inflammation can confound interpretation of MRI by mimicking prostate cancer.
- The false positive rate for MRI-Fusion biopsies can be high
- Several influencing factors including: MRI quality, radiology read, importing/segmentation of images and biopsy accuracy.
- We identify inflammation as one cause of false positives on MRI-Fusion biopsy that will need to be addressed in larger studies or combined with novel inflammatory biomarkers