

The Learning Curve for Multi-parametric MRI/US Fusion Guided Prostate Biopsy: A Single Center Experience



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Introduction

Multi-parametric MRI (mpMRI) with ultrasound fusion targeted biopsy has been increasingly utilized as a diagnostic procedure for patients suspected of having prostate cancer. Several aspects of fusion biopsy require learning, including lesion targeting and the mechanical use of various fusion biopsy devices. As targeted biopsy gains further adoption in prostate cancer diagnostics, understanding the learning curve of the procedure will be helpful for institutions considering implementation into their practice.

Materials and Methods

- Retrospective review of 173 cases
- mpMRI/US fusion targeted biopsies performed with Artemis™ (Eigen) fusion biopsy device
- Biopsies performed by one of five urologists with no prior experience with technique
- Procedure performed under local or monitored care anesthesia
- 5 biopsy cores obtained from each region of interest (ROI) followed by 12-core systematic biopsy
- Operative records used to document primary end point of length of procedure (LOP)
- Analysis of variance and chi-square tests used to compare continuous and categorical variables
- Multiple linear regression was utilized to assess independent predictors of LOP

Figure 1.

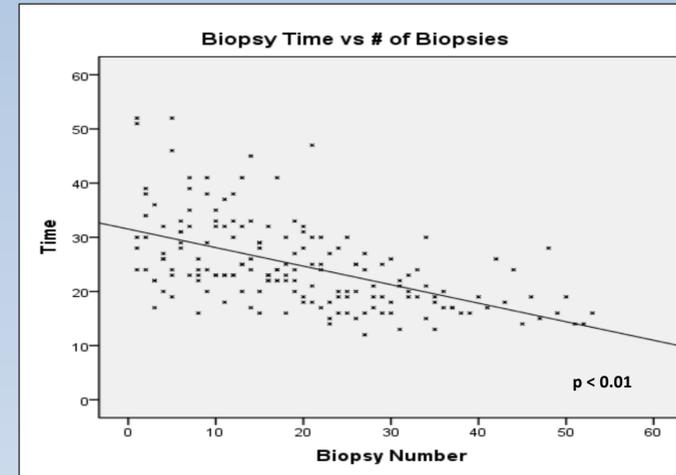


Figure 2.

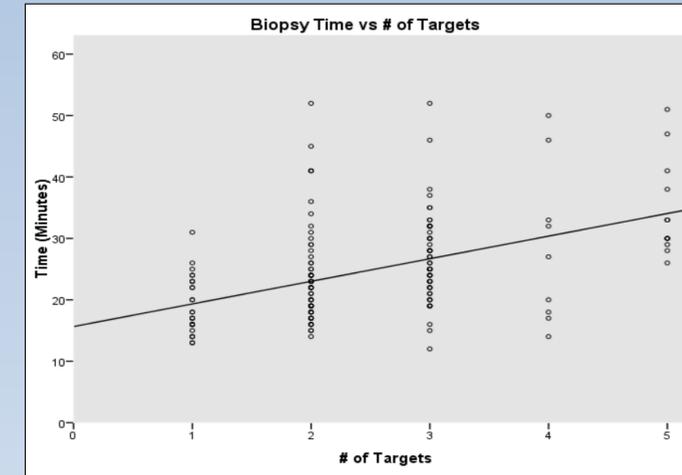
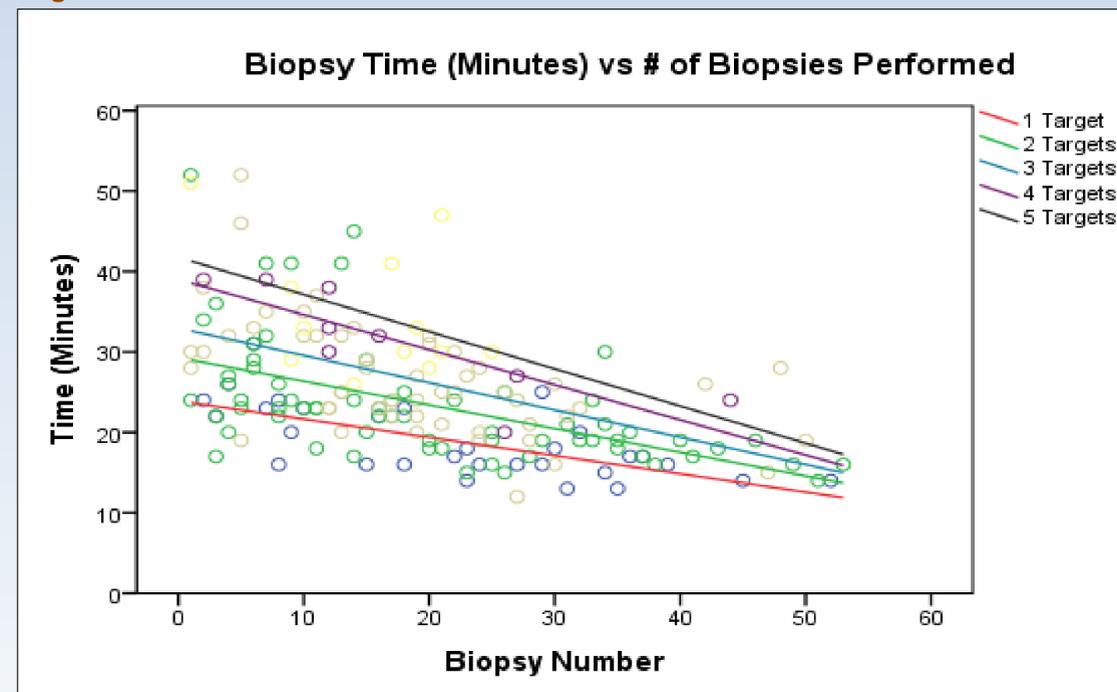


Figure 3.



Results

- LOP decreased with increasing operator experience, $p < 0.01$ (figure 1, table 1)
- No significant differences in number of ROIs detected over time, $p = 0.44$
- Lower number of ROIs and increasing biopsy experience were both significant predictors of shorter LOP, $p < 0.01$ (figures 2&3)

Table 1. Average case time by number

	Average minutes	SD	95% CI	
			Lower	Upper
Cases 1-10	30.4	9.3	27.7	33.0
Cases 11-20	25.1	7.3	23.0	27.2
Cases 21-30	21.6	6.4	19.5	23.7
Cases 31-40	18.6	4.3	16.7	20.5

Conclusion

- Decrease in LOP with increasing user experience
- Increase in LOP with increasing number of targets
- Likely to have further improvement in LOP with increasing experience