

Direct and marginal cost analysis of not aiming for the target in a MRI-targeted prostate biopsy pathway

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INTRODUCTION

The overall diagnostic yield of clinically significant prostate cancer (csPCa) in non-targeted biopsies in men with a suspicious mpMRI is reported to be 1% to 11%.

The aim of this multi-centre study was to evaluate:

- I. Direct cost and marginal analysis (MA)
- II. Pathologist reporting
- III. Tumour board reviewing time

that result from non-targeted prostate biopsies when performed alongside MRI-targeted biopsies.

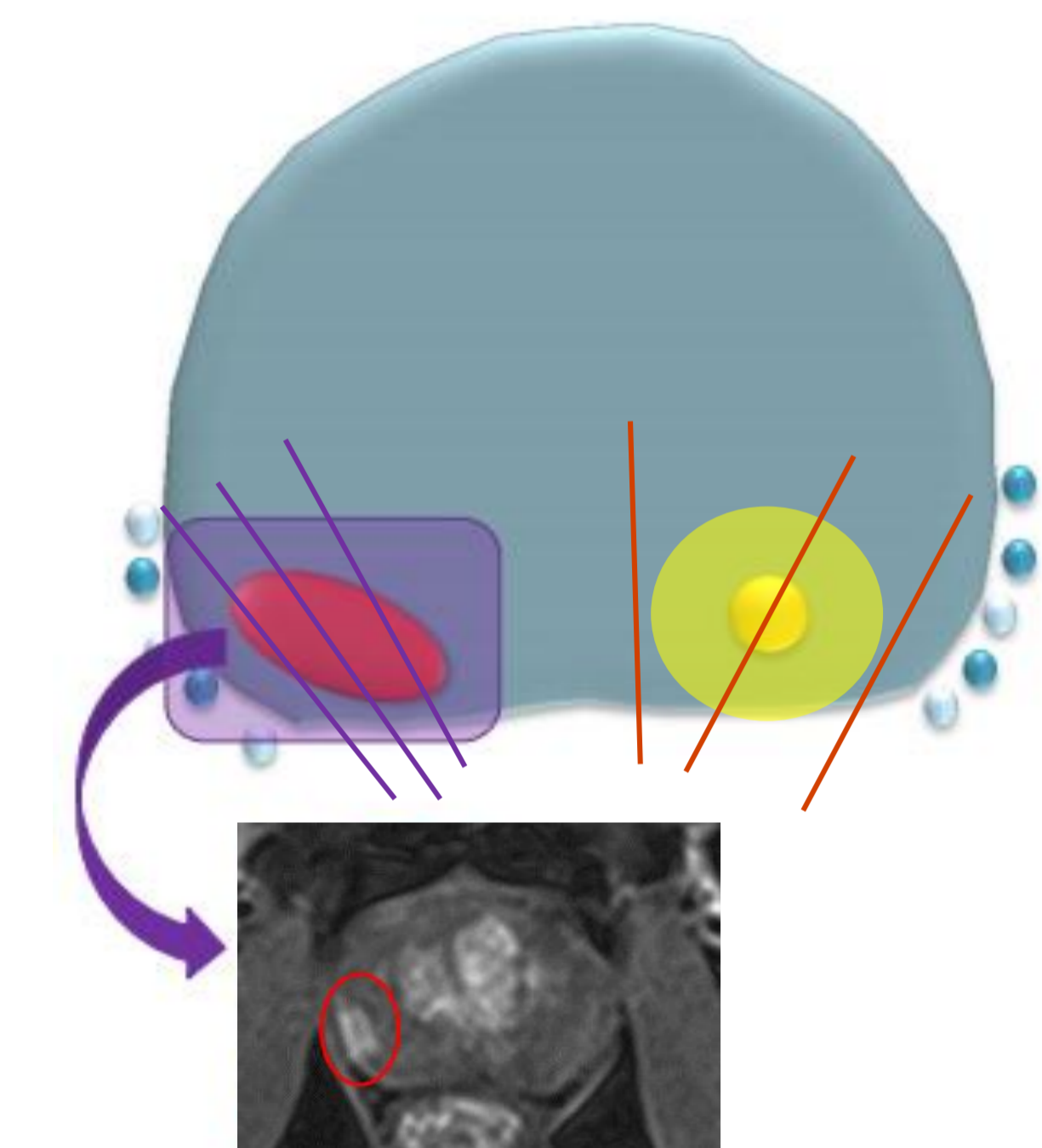


Figure 1. Targeted and systematic biopsy cores in relation to prior mpMRI. Targeted cores (purple line) of prostate tumour (red oval) demonstrated on pre-biopsy MRI (red circle). Second prostate tumour (yellow circle) without region of interest on mpMRI, detected on non-targeted systematic cores (red line).

METHODS

A prospective online cancer pathway registry of 1,719 consecutive patients (Apr/2017-Oct/2019). MA defined as cost to diagnose one additional case of csPCa. Reference cost of GBP£119/biopsy.

Pathologist reporting and tumour board reviewing time of 8 minute/biopsy and 1 minute/biopsy, respectively, were used. Patients were advised transperineal biopsy if MRI score was 4-5 or 3 with PSA-density ≥ 0.12 . csPCA was defined as Gleason $\geq 3+4$.

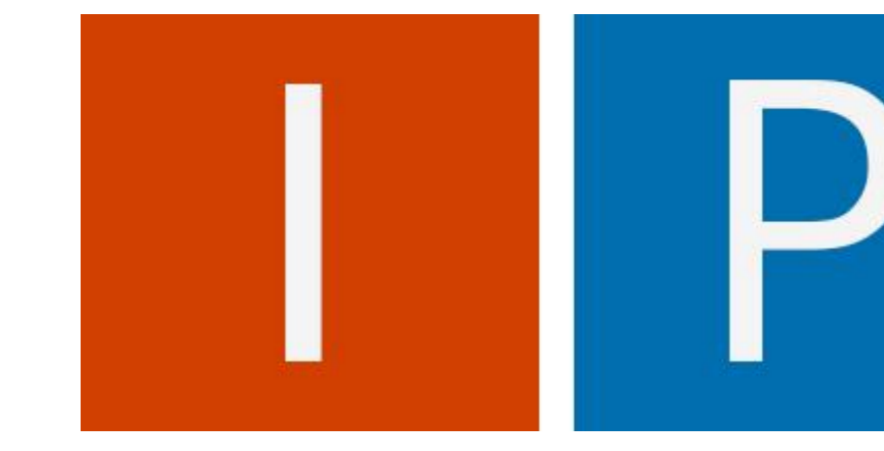
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£9,013.65 is the cost of detecting a clinically significant prostate cancer in a MRI non-targeted biopsy



RESULTS

- Mean age, median PSA and median prostate volume 65.7yrs (SD 8.5), of 6.7 (IQR 4.9-9.9) ng/ml and 50cc (IQR 35-75), respectively.
- 846 (49.2%) underwent biopsy with csPCa identified in 51.4% (435/846). csPCa was exclusively present in non-targeted prostate biopsies (i.e targeted biopsies had no cancer) in 2.5% (16/638).
- Direct cost of non-targeted negative or insignificant PCa was at £74,018.00 with 4,976 minutes of pathologist reporting and 622 minutes of tumour board reviewing time required.
- MA reported average cost per targeted and non-targeted case was £246.89 and £602.57, respectively.
- Marginal cost per case was £246.89 for targeted and £9,013.65 for exclusively non-targeted biopsy csPCa.

Biopsy Approach and Cancer Detection Rate						
Total referred patients	Number of prostate biopsies	Non-targeted and targeted prostate biopsies	Overall csPCa	csPCa exclusively present in non-targeted prostate biopsies		
1,719	846	638	51.4% (435/846)	2.5% (16/638)		
Direct Cost Analysis of Negative Non-Targeted Biopsies						
Direct histopathology cost (Reference Cost GBP£119/biopsy)		Pathologist reporting time (8 mins/biopsy)	MDT reviewing time (1 mins/biopsy)			
£74,018.00		4,976 minutes	622 minutes			
Marginal Cost Analysis						
Biopsy Type	csPCa detected	Additional cases detected	Number of biopsies	Total Histopathology cost (£)	Average cost per case (£)	Marginal cost per case (£)
MRI-Targeted	419	419	834	£99,246.00	£246.89	£246.89
Exclusive Non-Targeted	435	16	638	£252,478.00	£602.57	£9,013.65

Table 1. Direct cost and marginal analysis, pathologist and tumour board reviewing time

CONCLUSIONS

- Non-targeted biopsies performed in an MRI targeted-biopsy pathway have large direct and marginal costs per case.
- These consume valuable pathologist time but confer diminishing marginal benefit.