

Peripheral Zone Volume, Density, Ratio and Its Relation to Prostate Cancer and BPH

Introduction and Objective: Peripheral zone volume, density and ratio to transition zone use in the diagnosis of cancer.

Materials and Methods: There were 713 patients who had biopsy; 410 were benign and 265 had cancer (38 not assigned zones because of high grade cancer destroying the interface). We compared the biopsy cancer patients with 145 radical prostatectomies and then benign biopsy patients.

Results:

	Age	PSA	U test	P value
Benign biopsy	63	8		
Cancer biopsy	68	16.4	<0.001	
Surgery cases	62	7.5	<0.001	
Biopsies.			Cancer n =265	benign = 410 U test P value
			Volume cc	
Whole gland			46	58 <0.001
Transition zone			21	30 <0.001
Peripheral zone			25	27 >0.05
			Density ng/ml/cc	
Mean whole gland			0.41	0.16 <0.001
Transition zone			1.23	0.39 <0.001
Peripheral zone			0.76	0.34 <0.001
Comparison of biopsy cancer with surgical pre operative parameters.				
			Cancer on biopsy n =265	surgery n =145 U test P value
			Volume cc	
Whole gland			46	43 >0.05
Transition zone			21	17 <0.001
Peripheral zone			25	26 >0.05
			Density ng/ml/cc	
Whole gland			0.41	0.2 <0.01
Transition zone			1.23	0.93 >0.05
Peripheral zone			0.76	0.33 <0.001
Comparison of benign biopsy with surgical pre operative parameters				
			Benign biopsy n =410	surgery n = 145 U test P value
Mean whole gland			58	43 <0.001
Transition zone			30	17 <0.001
Peripheral zone			27	26 >0.05
			Density ng/ml/cc	
Mean whole gland			0.16	0.2 <0.001
Transition zone			0.39	0.93 <0.001
Peripheral zone			0.34	0.33 >0.05
Ratio of peripheral zone to transition zone and peripheral zone to whole gland.				
	Volume		Density	
biopsy	Ratio PZ/TZ	PZ/WG	Ratio PZ/TZ	PZ/WG
Benign	0.9	0.46	0.9	2.1
Cancer	1.2	0.54	0.6	1.8
Surgery	1.52	0.6	0.35	1.65

Conclusion: The ratio could be discriminatory between benign disease and cancer (no confounding effect of varying gland sizes and PSA levels). There is a higher transition zone density in surgical patients due to the small transition zone. This could be a useful parameter in its own right? If the ratio of peripheral volume to transition volume is greater than one it is likely malignant and if less, benign.