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MP81-01

Diagnostic performance of Fusion (US/MRI guided) prostate Biopsy: comparison between elastic versus rigid fusion system

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Introduction & Objectives

Many software for US/MRI guided prostate biopsy (PB), available for elastic or rigid fusion technology, have been developed in the last years. Most of data in literature reported diagnostic performance of fusion PB compared to systematic biopsy. However, there are few data comparing diagnostic accuracy of different systems based on fusion software.

We assessed diagnostic performance of elastic (EF) versus rigid fusion (RF) PB.

Material & Methods

A total of 615 fusion PB were prospectively collected from 2 different centres. Overall, 359 PB were performed using a RF system and 265 using a EF software. All procedures were performed transrectally by an expert urologist. The two groups were compared for the main clinical features. Detection rate (DR) for any prostate cancer (PCa) and clinically significant (cs) PCa were compared and stratified for PIRADS Score.

Chi square and Fisher test were used to compare categorical variables and Student T test for continuous variables.

Results

The two cohorts were homogeneous for the main clinical variables, except for rate of previous biopsy (p=0.044) and number of total cores taken (p<0.001 (Table 1). At a per patient analysis, DR of EFPB was higher than that obtained with RFPB (71.3% vs 59.3%, respectively, p=0.002), while detection rate of csPCa was comparable between the two groups (46.8% and 52.1%, respectively p=0.76). At a per core evaluation, DR of any PCa cancer and csPCa was comparable between the two cohorts (all p>0.164). (Table 2) After stratifying for PIRADS Score, DR of any PCa was higher in the EFPB group only for PIRADS 4 (77% vs 63%, p=0.007). Concerning csPCa, DR was comparable between the two cohorts for every PIRADS score. (Table 3)

Table 1	Rigid FPB (n = 359)	Elastic FPB (n = 265)	p value*
Age, Median (IQR)	70 (65-75)	66 (59-71)	0.08
PSA, ng/ml Median (IQR)	8 (5.8-20)	7.5 (5.2-10.8)	0.48
Prostate Volume, ml Median (IQR)	53.9 (42.9-58.3)	54 (35-59.3)	0.810
N° of ROI, Median (IQR)	1 (1-2)	1 (1-2)	0.96
ROI Max diameter, mm Median (IQR)	10 (8-15)	8 (6-13)	0.07
DRE N (%)	79 (22)	53 (20)	0.72
Previous Biopsy N (%)	43 (11.9)	41 (15.5)	**0.044**
PI-RADS Score, N (%)			
3	97 (27)	51 (19.2)	
4	192 (53.5)	152 (57.4)	0.214
5	70 (19.5)	62 (23.4)	
Total Cores, Median (IQR)	15 (8-17)	22 (19-30)	**< 0.001**
Target Cores, Median (IQR)	6 (5-8)	6 (4-8.5)	0.754

*** Student-t test or Chi-Square test**

Table 2

Per patient Detection rate (%)	EFPB	RFPB	p
Any G score	71.3	59.3	**0.002**
G score≥7	46.8	52.1	0.196
Per Core Detection Rate (%)			
Any G score	22.5	20	0.164
G score≥7	17.5	19.1	0.687

Table 3

Detection rate (%)	PI-RADS score	EFPB N (%)	RFPB N (%)	p
Any GS	3	17/51 (33.3)	29/97 (29.9)	0.711
	4	117/152 (77)	121/192 (63)	**0.007**
	5	55/62 (88.7)	63/70 (90)	0.810
GS>6	3	5/51 (9.8)	21/97 (21.6)	0.110
	4	71/152 (46.7)	105/192 (54.7)	0.158
	5	48/62 (77.4)	61/70 (87.1)	0.171

Conclusions

Fusion PB guarantee high diagnostic accuracy for csPCa, regardless the fusion technology. Prospective randomized study are needed to confirm these data.