Impact of the interval between prostate biopsy and radical prostatectomy on the paramaters of the surgical specimen

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Background : Currently, most patients are diagnosed with localised prostate cancer (PC) based on prostate-specific antigen testing[1]. With the rising incidence of PC, some of these patients might be confronted with a delay in therapy due to limited capacities. Other patients will request second or third opinion on the treatment selection. A few studies have shown that a time to radical prostatectomy (RP) has no impact on biochemical failure rate[2,3]. Moreover, hasty indication for surgery may result in a higher rate of complications[4].

Aim : Assessment of the time between prostate biopsy (PB) and radical prostatectomy (RP) and its possible association with histopathological parameters of the surgical specimen.

Material and methods : Between 2000 and 2012 we have performed a total of 1028 RP at our department. Cases with a neoadjuvant hormonal therapy (n=63), time to RP longer than 12 months (n=23), no tumour in surgical specimen (n=14) and missing data (n=23) were excluded. We have recorded standard clinical data, pathological stage (pT), Gleason score (GS) and the highest Gleason grade (Gmax) in biopsy and the change of GS and Gmax in the surgical specimen, margin status and perineural invasion (PI) in all cases. We have evaluated input parameters by using the method of nonparametric ANOVA (Wilcoxon test) or contingency tables (Chi-square test).

Table 1. Preoperative characteristics (n=905)

	n	%
Age		
< 50 years	17	1.9
50 - < 60 years	236	26.1
60 - < 70 years	552	61.0
≥ 70 years	100	11.0
Clinical T stage		
T1c	532	58.8
T2	334	36.9
T3	29	3.2
Biopsy Gleason score		
≤6	683	75.5
7	171	18.9
8-9	51	5.6
iPSA levels		
< 10 ng/ml	612	67.6
10-20 ng/ml	244	27.0
> 20 ng/ml	49	5.4
Time to radical prostatectomy (days)		
0-59	320	35.4
60-120	471	52.0
121-365	114	12.6

iPSA – initial prostate-specific antigen

Table 2. Histopathological characteristics (n=905)

	n	%
Pathological T stage		
pT2	649	71.7
pT3a	127	14.0
pT3b	122	13.5
pT4	7	0.8
Prostatectomy Gleason score		
≤6	555	61.3
7	265	29.3
8-9	85	9.4
Surgical margin		
negative	687	75.9
positive	218	24.1
Perineural invasion		
negative	223	24.6
positive	494	54.6
not mentioned	188	20.8

Fig. 1. Impact of clinical T stage on time to RP

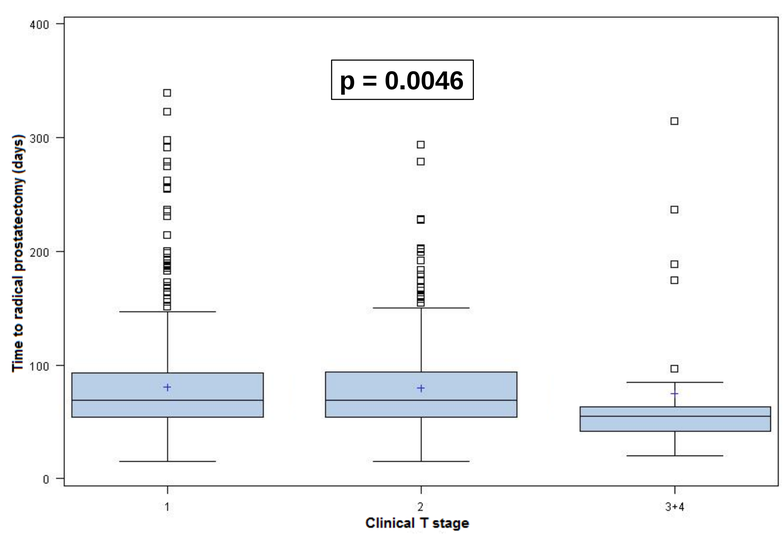

Fig. 2. Impact of time to RP on pathological T stage

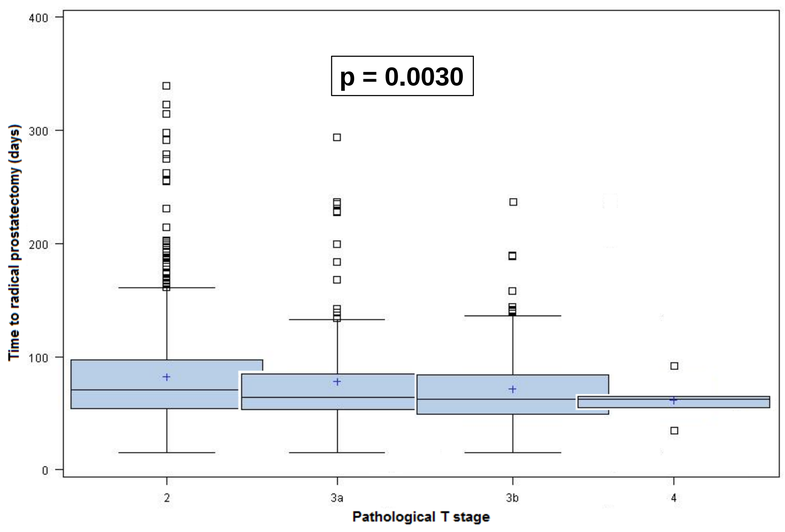

Table 3. Correlation with time to surgery

Preoperative parameters	p-value
Age	0.7366
iPSA	0.3592
Clinical stage	**0.0046**
Biopsy GS	0.6430
The highest biopsy grade	0.3730
Postsurgical parameters	
Pathological stage	**0.0030**
Prostatectomy GS	0.0562
The highest prostatectomy grade	0.1593
Sugical margin status	0.2402
Perineural invasion	**0.0098**

Table 4. Differences of tumour grade (p-values)

Impact of time to RP on a change	Difference of change between interval	Trend analysis
Biopsy - prostatectomy GS change		
0.7071	0.1940	< 0.0001
Biopsy - prostatectomy highest grade change		
0.6796	0.6796	< 0.0001

Comment : Differences of both biopsy - prostatectomy Gleason score and the highest Gleason grade were tested in three ways. Firstly, correlation of the absolute change with time to radical prostatectomy was analysed. Secondly, analysis of the frequency of variances within respective intervals was performed. Both analysis were done by using nonparametric ANOVA.

Both tests were not statistically significant, time to radical surgery has no impact on the change of tumour grade, moreover variances of tumour grade are similar within respective intervals.

Trend analysis was performed by using Sign-test. For the whole group, there was a statistically significant change to worse Gleason score or the highest grade in prostatectomy specimen.

Comment : Patients with presumably advanced tumour were more often indicated for an early surgery. Clinical stage is considered as one of parameters predicting pathological stage. This selection bias caused statistically significant difference of pathological stage between respective intervals to radical prostatectomy.

Conclusion : Time to RP has no significant impact on worsening of pathological finding in the specimen after RP. Patients with more clinically advanced tumour are in general operated on sooner.

Results : A total of 905 patients entered the analysis, time between PB and RP was divided into three intervals: 0-59 (n=320), 60-120 (n=471) and 121-365 (n=114) days. Clinical stage was significantly different between the intervals (p=0.0046), patients were operated on sooner in case of more advanced tumour. Longer interval between PB and RP did not worsen any of the monitored parameters. In patients that were operated on sooner, the findings of pT3-4 stage (p=0.0030) and PI (p=0.0098) were more frequent. We demonstrated significant increase of the GS and Gmax values in the surgical specimen (p<0.0001) in the whole cohort, however differences between respective intervals were not statistically significant.

References :

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