Lymph node involvement in prostate cancer after laparoscopic pelvic lymph node dissection

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Introduction

Despite current use of MRI for lymph node staging in patients with prostate cancer (PCa), extended pelvic lymph node dissection (ePLND) is still the gold standard. Lymph node staging is mandatory in patients with intermediate and high risk prostate cancer (EAU guidelines) when treatment with curative intention is chosen. The presence of disseminated lymph nodes gives an elevated risk of systemic dissemination of PCa. Thus accurate knowledge concerning LNI is very important.

Objectives

To present a table showing LNI in our patient cohort and to investigate the possibilities of using the tables for therapy decision making in our patients.

To asses the accuracy of other predictive tools in our patient population

Methods

We analyzed 395 patients (325 (83.1%) in center one and 66 (16.9%) in center two) who underwent a laparoscopic pelvic lymph node dissection (LPLND) from January 2000 until may 2012 in two general hospitals located in the Netherlands. The LPLND's were done according the current standard LND template and were performed by three urologists. We divided the groups according to the risk groups stated in the EAU guidelines for prostate cancer.

Results

Mean age was 65 years (SD ±6.5). Mean lymph node count was 11 (SD ±6.2). 72 (18.4%) of the 392 patients had LNI. None of the patients in the EAU low risk group had LNI. In the intermediate risk group 13 (8%) patients had LNI, in the high risk group 59 (30.7%) patients had LNI.

Table 1 - Patient Characteristics

	Overall	LN+	LN-	p-value
Age (yr), mean (±SD)	65.4 (±6.5)	65.0 (±5.4)	65.5 (±6.7)	0.5
PSA (ng/ml), mean (±SD)	23. 8(±36.6)	46.5 (±70.9)	18.7 (±19.3)	<0.001
No. of removed and examined lymph nodes, mean (±SD)	11 (±6.2)	12.3 (±7.7)	10.6 (±5.7)	0.06
n=	**395**	**73 (18.5%)**	**322 (81.5%)**	
PSA < 10	132 (33.4%)	11 (15.1%)	121 (37.6%)	
PSA 10 – 20	135 (34.2%)	21 (28.8%)	114 (35.4%)	
PSA > 20	128 (32.4%)	41 (56.2%)	87 (27%)	
				<0.001
cT1a-T2a	129 (32.7%)	8 (10.1%)	121 (37.5%)	
cT2b-T2c	186 (47.1%)	34 (46.6%)	152 (47.2%)	
cT3	80 (20.2%)	31 (42.5%)	49 (15.2%)	
				<0.001
Gleason 2-6*	202 (51.1%)	18 (24.7%)	184 (57.1%)	
Gleason 7*	133 (33.7%)	33 (45.2%)	100 (31.1%)	
Gleason 8-10*	60 (15.2%)	22 (30.1%)	38 (11.8%)	
				<0.001

SD= standard deviation, PSA = prostate specific antigen, LN+= lymph node involvement, LN-= no lymph node involvement, p-value's are comparing LN+ against LN- using Chi-square test. * Gleason score from prostate biopsy specimen

Table 2 - LNI in our patient cohort, categorized by PSA level, clinical stage (TNM) and Gleason score

	cT1a-cT2a		cT2b-cT2c		cT3	
	LN-	LN+	LN-	LN+	LN-	LN+
PSA <10 (n=132)						
Gleason <7 (n=75)	37 (100%)	0 (0%)	25 (92.6%)	2 (7.4%)	10 (90.9%)	1 (9.1%)
Gleason 7 (n=46)	16 (100%)	0 (0%)	21 (91.3%)	2 (8.7%)	4 (57.1%)	3 (42.9%)
Gleason >7 (n=11)	2 (66.7%)	1 (33.3%)	3 (75%)	1 (25%)	3 (75%)	1 (25%)
PSA 10-20 (n=135)						
Gleason <7 (n=75)	30 (96.8%)	1 (3.2%)	37 (92.5%)	3 (7.5%)	3 (75%)	1 (25%)
Gleason 7 (n=38)	6 (85.7%)	1 (14.3%)	17 (81%)	4 (20%)	7 (70%)	3 (30%)
Gleason >7 (n=22)	3 (60%)	2 (40%)	8 (80%)	2 (20%)	3 (42.9%)	4 (57.1%)
PSA >20 (n=128)						
Gleason <7 (n=52)	17 (94.4%)	1 (5.6%)	21 (77.8%)	6 (22.2%)	4 (57.1%)	3 (42.9%)
Gleason 7 (n=49)	9 (81.8%)	2 (18.2%)	9 (56.3%)	7 (43.8%)	11 (50%)	11 (50%)
Gleason >7 (n=27)	1 (100%)	0 (0%)	11 (61%)	7 (38.9%)	4 (50%)	4 (50%)

PSA = prostate specific antigen, LN+ = lymph node involvement, LN- = no lymph node involvement

= Low-risk group = Intermediate-risk group = High-risk group

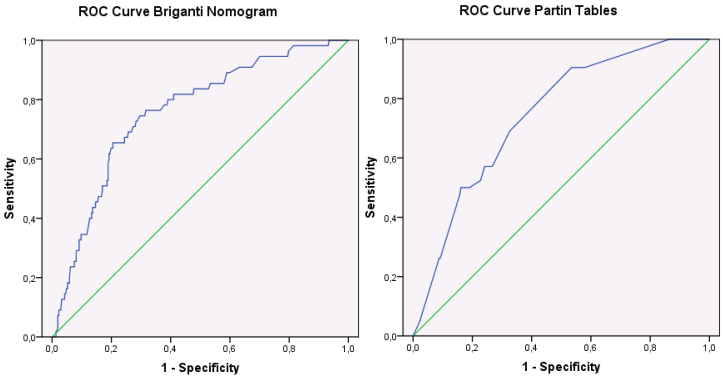

Table 3 - Area Under the ROC-curve

Briganti Nomogram [Briganti et al. 2006] (n=362)	76%	CI[0.69-0.83]
Updated Partin Tables [Makarov et al. 2007] (n=315)	75%	CI[0.67-0.82]

Conclusion

Due to population differences, stage and grade migration, bias of clinical staging and bias of pathologic staging, external validation of predictive tools is necessary to asses their usability in different hospital settings and different patient populations. We see differences in patient characteristics and incidence of LNI between our cohort and the the updated Partin cohort.
We propose standard registration of data concerning LNI in PCa and we promote the use of guidelines. In this way nomograms can be validated with contemporary and regional series to ensure their accuracy.