

## **Pelvic lymph node dissection in prostate cancer: 'proof versus evidence'**

Jonathan Aning  
Uro-oncology fellow

### **PLND in Prostate Cancer**

- Clinically relevant topic
- Low risk patients receive active surveillance
- In whom, how and why to do PLND in the remainder is an important question
- Proof v Evidence: How do you know something is true
  - Proof = hard facts – logically / deductively define
  - Evidence = nuances – beauty is in the eye of the beholder

## Anecdote

- Papers premise v simple – at robotic prostatectomy we take pre-prostatic fat there are lymph nodes present and they may be positive. Send / Remove the tissue
- Reviewer comment: ‘ had an especially good ePLND been done, I bet that all patients would have had positive nodes elsewhere such that the study finding did not change anything, in my experience... ‘

## PLND - Issues

- EPLND is now advocated in guidelines
- What are appropriate boundaries?
- The staging effect seems logical
- ? therapeutic advantage in prostate cancer

## What is the extent of the problem?



### *The Incidence and Extent of Pelvic Lymph Node Metastases in Apparently Localized Prostatic Cancer*

JACKSON E. FOWLER, JR., MD,\* AND WILLET F. WHITMORE, JR., MD†

- 300 cases, biopsy proven CAP, 1970-1977
  - Lymph node dissection:
    - Bilateral extraperitoneal dissection
    - Superior – bifurcation of common iliac
    - Inferiorly – endopelvic fascia
    - Medial – perivesical fat and hypogastric
    - Lateral – side wall and genitofemoral nerve
    - \*all vessels skeletonised, nodes sent separately in all but 4 cases
  - 40% of patients lymph node positive
  - Distribution 61%: obturator and 39% external iliac
  - T2a/b, T2c, T3 = 7%, 43%, 60% +ve lymph node rate
- Pre PSA – lymph node positive rates >25%

Fowler et al. Cancer 1981

## Trends in PLND over the PSA era

- CAPSURE database analysis 1992-2004, n=4303
  - Rates of PLND decreased from 94%-80%
  - Positive nodes were identified in 0.87%, 2.0% and 7.1% of low, intermediate and high risk groups respectively ( D'Amico )
  - >90% of high risk patients had PLND
  - Mean number of nodes taken 5.7

Kawakami et al. J Urol 2006

## EPLND in the PSA era - Europe

- 365 men, median age 64, median PSA 11.9
- Lymph node dissection
  - Bilateral extraperitoneal dissection
  - Superior – bifurcation of common iliac
  - Inferiorly – endopelvic fascia
  - Medial – perivesical fat and hypogastric
  - Lateral – side wall
  - \*all vessels skeletonised, nodes sent seperately
- Median nodal yield 21
- Lymph node positive rate 24%
- If you stay above the obturator nerve with the dissection you will miss 19% of nodes

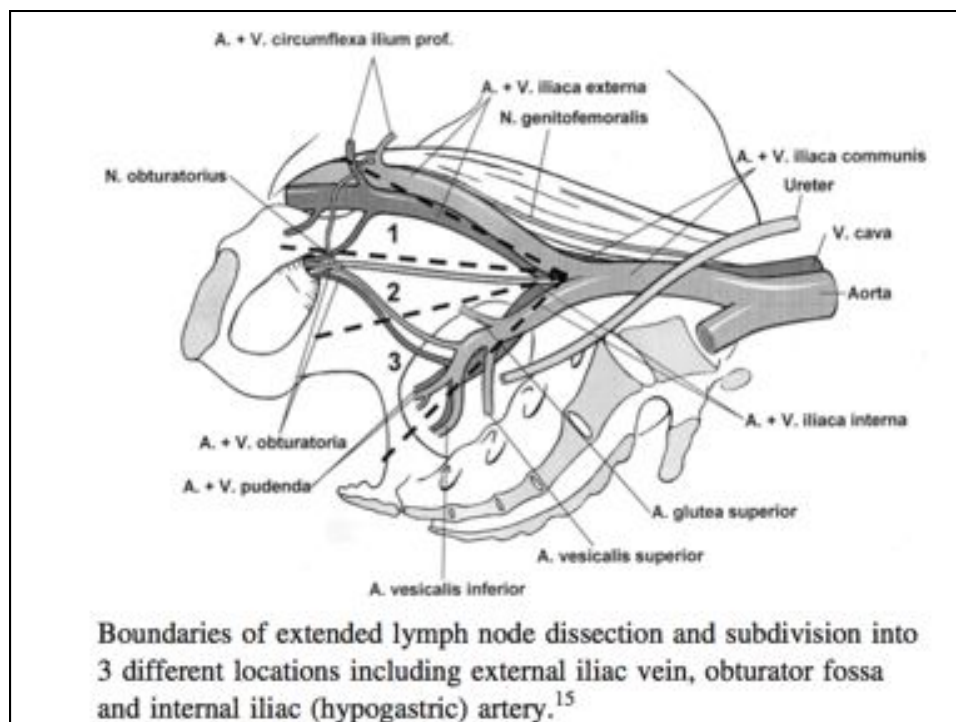
Even though there has been a stage migration in prostate cancer nodes are there

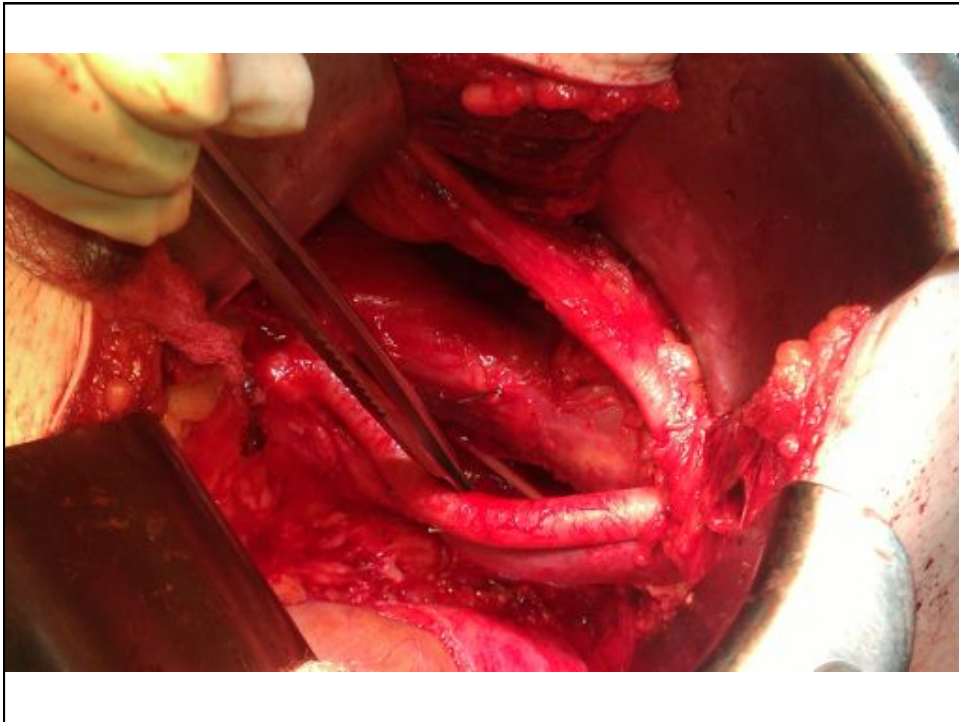
Bader et al. 2002

## EPLND in the PSA era - USA

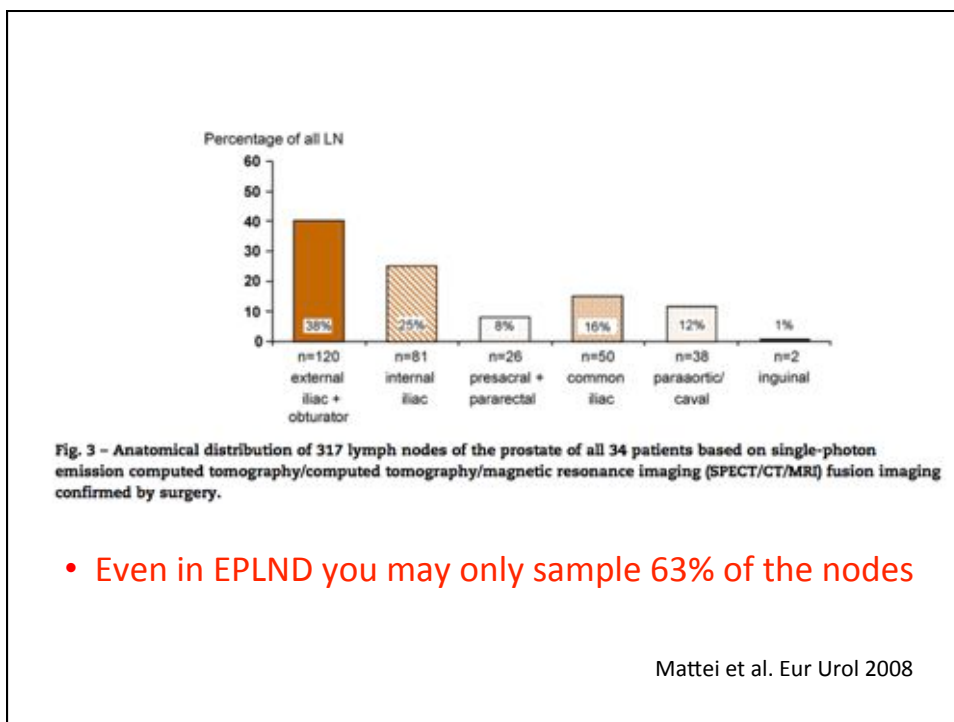
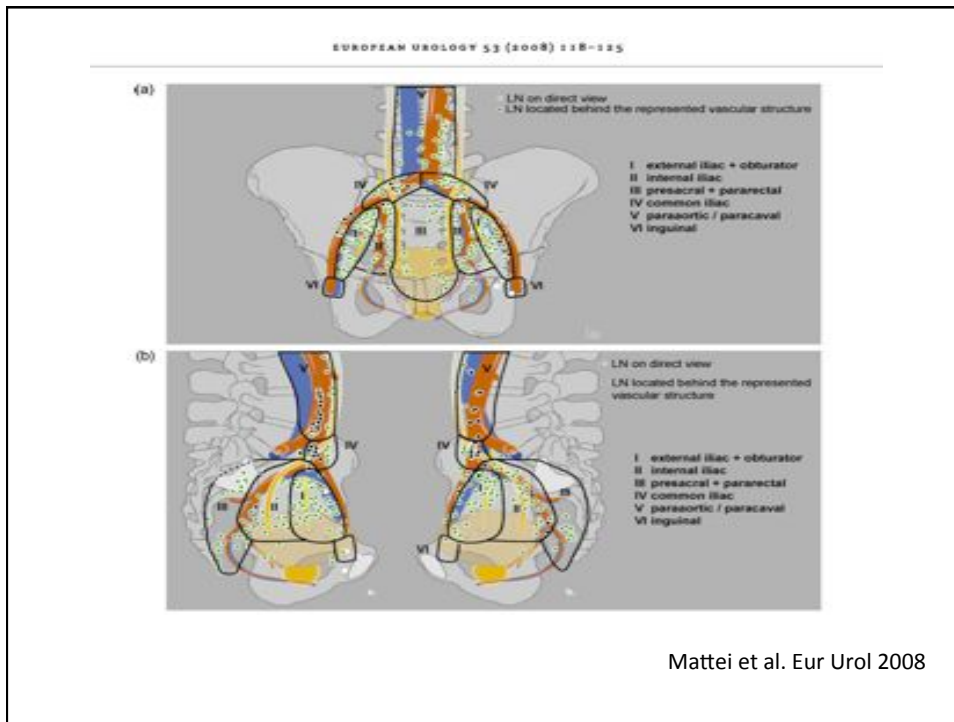
- 427 men, median age 60, median PSA 5.25
- Lymph node dissection
  - Bilateral extraperitoneal dissection
  - Superior – bifurcation of common iliac
  - Inferiorly – endopelvic fascia
  - Medial – perivesical fat and hypogastric
  - Lateral – side wall
  - nodes sent separately
- Median nodal yield 16
- Lymph node positive rate 8 %
- If you stay above the obturator nerve with the dissection you will miss 26% of nodes

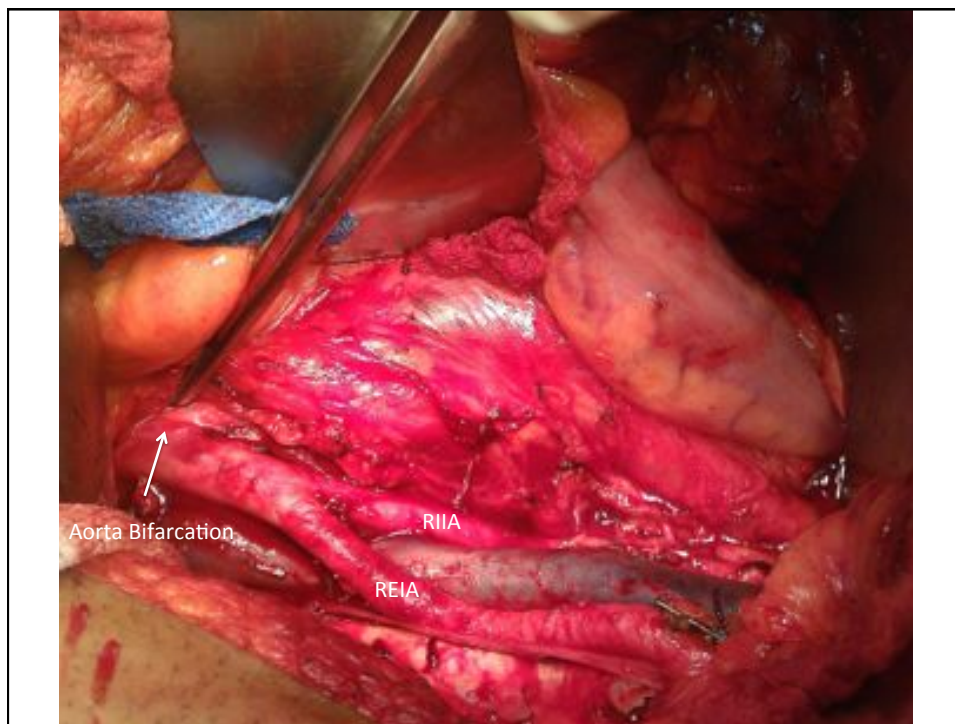
Godoy et al. J Urol 2012





**Where do prostate cancer lymph nodes drain to?**





**Can we detect or assess pelvic lymph node risk prior to surgery?**

**Imaging**

**Nomograms**



## Imaging – CT and MRI

- CT & MRI are poor for determining lymph node invasion
- Both are reliant on size criteria - 1cm short axis for oval nodes and 0.8cm for round nodes
- In a 2008 meta-analysis (24 studies included)
  - CT sensitivity 0.42 and specificity 0.82
  - MRI sensitivity 0.39 and specificity 0.82

Jager et al. Am J Roentgenol 1996  
Hovels et al. Clinical Radiology 2008

## Imaging – PET

- (18)F- disappointing for N staging  
When evaluated picked up 1 node which was positive by size criteria but missed 4 positive nodes out of 115 nodes sampled from 25 patients
- (11)C- better than nomograms but low sensitivity  
In intermediate and high risk patients pre op imaging had a sensitivity of 60% and specificity of 97%

Husarik et al. Eur J Nucl Med Mol 2008

Schiavina et al. Eur Urol 2008

## Imaging – USPIO

- MRI and highly lymphotropic superparamagnetic nanoparticles concept introduced 2003
- Study of 75 men, 1999-2002
- 41% of patients had LNI
- Correctly identified all men with positive nodes
- It had a higher sensitivity than MRI on a node by node basis (90.5% v 35.4%)
- In 2013 detects metastases in apparently normal pelvic lymph nodes in bladder and prostate cancer with sensitivity 58% and specificity 83%

Harisinghani et al. NEJM 2003  
Triantafyllou et al. Eur J Cancer 2013

## Nomograms

- Makarov et al. Urology (2007) 1095-1101 – updated Partins
- Cagiannos et al. J Urol(2003) 1798-1803 – Kattin
- Briganti et al. Eur Urol (2006) 1019-1027 – Prediction in ePLND

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**eau**  
European Association of Urology



**Platinum Priority – Prostate Cancer**  
*Editorial by A. Heidenreich on pp. 488–490 of this issue*

**Updated Nomogram Predicting Lymph Node Invasion in Patients with Prostate Cancer Undergoing Extended Pelvic Lymph Node Dissection: The Essential Importance of Percentage of Positive Cores**

*Alberto Briganti<sup>a,\*</sup>, Alessandro Larcher<sup>a</sup>, Firas Abdollah<sup>a</sup>, Umberto Capitanio<sup>a</sup>, Andrea Gallina<sup>a</sup>, Nazareno Suardi<sup>a</sup>, Marco Bianchi<sup>a</sup>, Maxine Sun<sup>c</sup>, Massimo Freschi<sup>b</sup>, Andrea Salonia<sup>a</sup>, Pierre I. Karakiewicz<sup>c</sup>, Patrizio Rigatti<sup>a</sup>, Francesco Montorsi<sup>a</sup>*

## Methodology: Briganti et al

- 588 patients
- All patients had RP and ePLND
- ePLND – Lateral border pelvic side wall, medial border perivesical fat, distal limit deep circumflex vein and femoral canal, nodes along the obturator, external and internal iliac and hypogastric vessels were taken
- In addition only cases submitted to evaluation with greater than 10 nodes removed and examined were included
- PSA, Clinical stage, primary and secondary gleason grade and percentage of positive core biopsies were then used in UVA and MVA to form nomogram

Table 1 - Descriptive characteristics of patients treated between November 2002 and August 2006 (nomogram development cohort) [6] and patients treated between September 2006 and October 2010 (nomogram update cohort)

	Overall nomogram development cohort (2002-2006) [6] n = 278	Update nomogram cohort (2006-2010)			p value
		Overall n = 588 (100%)	pN0 n = 539 (91.6%)	pN1 n = 49 (8.3%)	
Age, yr					0.9
Mean (median)	66.2 (66.6)	65.2 (65.9)	65.2 (66.0)	65.3 (65.3)	
IQR	60.6-70.7	60.3-70.4	60.3-70.6	60.3-69.5	
PSA level, ng/ml					<0.001
Mean (median)	9.9 (7.5)	8.0 (6.3)	7.5 (6.1)	12.8 (9.0)	
IQR	5.2-11.5	4.6-8.9	4.7-8.7	6.2-12.5	
Clinical stage (X)					<0.001
T1	165 (59.4)	373 (63.4)	369 (66.8)	13 (26.5)	
T2	105 (37.8)	184 (31.3)	164 (30.4)	20 (40.8)	
T3	8 (2.9)	31 (5.3)	15 (2.8)	16 (32.7)	
Primary Gleason grade (X)					<0.001
<3	255 (91.7)	488 (83.0)	466 (86.5)	22 (44.9)	
≥4	23 (8.3)	100 (17.0)	73 (13.5)	27 (55.1)	
Secondary Gleason grade (X)					<0.001
<3	188 (67.6)	406 (69.0)	386 (71.6)	20 (40.8)	
≥4	90 (32.4)	182 (31.0)	153 (28.4)	29 (59.2)	
No. of cores taken					0.11
Mean (median)	12 (12)	17 (16.5)	17.3 (17)	16.1 (15.5)	
IQR	11-14	13-24	14-24	12-18	
No. of positive cores					<0.001
Mean (median)	5.1 (4.0)	7.4 (6)	7.1 (6)	10.2 (10.5)	
IQR	2-6	3-10	3-10	6-14	
Percentage of positive cores, %					<0.001
Mean (median)	44.7 (37.5)	43.6 (35.5)	41.0 (33.3)	71.7 (78.6)	
IQR	20-66.7	16.7-60.8	16.7-57.1	51.0-100	
Pathologic stage					<0.001
pT2	199 (71.5)	431 (73.3)	427 (79.2)	4 (8.2)	
pT3a	48 (17.3)	97 (16.5)	84 (15.6)	13 (26.5)	
pT3b	31 (11.1)	58 (9.9)	28 (5.2)	30 (61.2)	
pT4	-	2 (0.3)	0	2 (4.1)	
Pathologic Gleason score					<0.001
2-6	109 (42.1)	223 (37.9)	222 (41.2)	1 (2)	
7	128 (46.0)	282 (48)	260 (48.2)	22 (44.9)	
8-10	33 (11.9)	63 (10.7)	43 (8)	20 (40.8)	
Missing	-	20 (3.4)	14 (2.6)	6 (12.3)	
No. of removed and examined lymph nodes					0.06
Mean (median)	17.5 (16.5)	20.8 (19.0)	20.5 (19.0)	23.3 (21.0)	
IQR	13-21	15-25	15-25	16-28	
No. of positive lymph nodes in patients with LN1					NA
Mean (median)	2.6 (1.0)	2.9 (2)	NA	2.9 (2)	
IQR	1-3	1-3		1-3	

IQR = interquartile range; PSA = prostate-specific antigen; LN1 = lymph node invasion; NA = not applicable.  
 All patients underwent radical prostatectomy and extended pelvic lymph node dissection. The update cohort is stratified according to lymph node status.

## Focus on cohort characteristics

Primary Gleason grade (X)					<0.001
<3	255 (91.7)	488 (83.0)	466 (86.5)	22 (44.9)	
≥4	23 (8.3)	100 (17.0)	73 (13.5)	27 (55.1)	
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IQR	11-14	13-24	14-24	12-18	
No. of positive cores					<0.001
Mean (median)	5.1 (4.0)	7.4 (6)	7.1 (6)	10.2 (10.5)	
IQR	2-6	3-10	3-10	6-14	
Percentage of positive cores, %					<0.001
Mean (median)	44.7 (37.5)	43.6 (35.5)	41.0 (33.3)	71.7 (78.6)	
IQR	20-66.7	16.7-60.8	16.7-57.1	51.0-100	
Pathologic stage					<0.001
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pT3b	31 (11.1)	58 (9.9)	28 (5.2)	30 (61.2)	
pT4	-	2 (0.3)	0	2 (4.1)	

## Results: Briganti et al.

- Mean number of nodes removed 20.8
- LNI was found in 49/588 patients – 8.3%
- Of all variables % positive cores was strongest predictor
- Sensitivity, specificity and negative predictive value associated with using a 5% probability of LNI cut off: 87.8%, 70.3%, and 98.4%
- Assuming this 385/588 patients would have been spared ePLND and LNI would be missed in only 6 patients (1.5%)

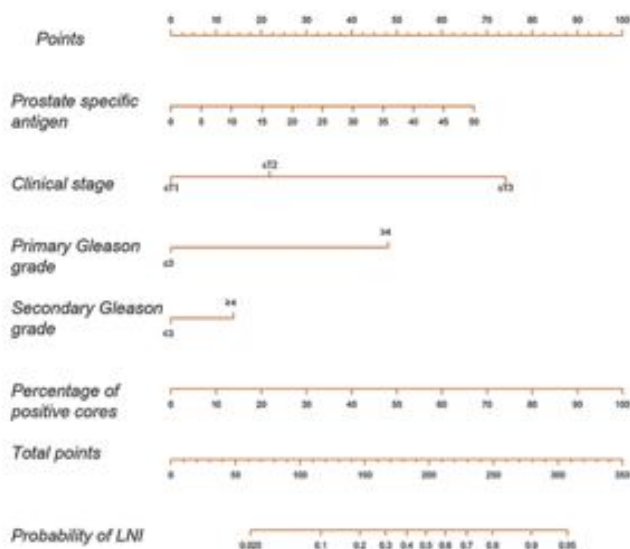


Fig. 1 - Nomogram predicting the probability of lymph nodes invasion (LNI) in patients undergoing extended pelvic lymphadenectomy based on pretreatment prostate-specific antigen (PSA), clinical stage, primary and secondary biopsy Gleason score, and percentage of positive cores. Instructions: Locate the patient's pretreatment PSA on the PSA axis. Draw a line straight upward to the point axis to determine how many points toward the probability of positive lymph nodes the patient receives for his PSA value. Repeat the process for each additional variable. Sum the points for each of the predictors. Locate the final sum on the total point axis. Draw a line straight down to find the patient's probability of having LNI.

## Comment Briganti et al 2012

- Only predictive models based on eplnd series can reliably assess the risk of LNI
- A mean of 17 prostate biopsy cores were taken from each individual – this is not standard
- There is a limited sample number especially in those with intermediate to high risk features

Currently all available nomograms are being evaluated in a prospective randomised phase 3 trial of the german association of oncological urology assessing the oncologic benefit of PLND v ePLND in prostate cancer

## The role for surgery



### Prospective RCT of extended versus limited PLND in patients with clinically localized prostate cancer

- Extended lymph node dissection was compared to limited lymph node dissection within the same patient
- 123 patients
- T1c 88 patients (72%), T2 (27%), T3 (1%)
- Mean PSA 7.4
- G1 6 or less 68%, G1 7 in 20%, 8 or higher in 12 %
- Extended lymph node dissection
  - Superior – bifurcation of common iliac
  - Inferiorly – endopelvic fascia
  - Medial – perivesical fat and hypogastric
  - Lateral – side wall and genitofemoral nerve
- Limited lymph node dissection
  - External iliac and obturator

Clark et al. J Urol 2003

## RCT results

- 8 patients had LNI (6.5%)
- Positive nodes were found on ePLND patients in 4
- Positive nodes were found on the IPLND in 3
- Positive nodes were found on both sides in 1
- Trend Higher rate of complications in ePLND arm
- Nodes were not found in gl6 or less/psa <10 / T1c the largest group in the study
- Conclusion – ePLND identifies few with nodal mets not found by a more limited dissection with a trend towards increased complications

Clark et al. J Urol 2003

## RCT limitations

- Underpowered
- Side of EPLND was not correlated with the side of positive tumor – assuming most tumours drain to the ipsilateral side
- Nodes were sent en bloc to the pathologist so could not describe which region nodes originated
- The total number of nodes taken was not recorded for each template
- Pathological analysis technique was not described



Is there evidence to support laterality of  
of lymph node drainage patterns?

Correlation between side of palpable tumour  
and side of metastases

- Cohort of 100 men with lymph node metastases
- Divided the patients into cohort tumour palpable on left, right and both sides
- In the 35 patients with unilateral palpable tumour the metastases were found in the ipsilateral lymph nodes in 29 (83%) Only 6 (17%) had contralateral metastasis alone
- Conclude if you were going to sample nodes do the ipsilateral side first

Harrison et al. Cancer 1992

## Correlation of laterality in contemporary cohort

- DRE, TRUS, PNB alone are not accurate enough predict laterality in unilateral disease – approximately 15% - 30% of positive nodes will be contralateral only

Speiss et al. Urol Oncol 2008  
Weckermann et al. BJU Int 2007  
Tokuda et al Am J Surg Pathol 2010

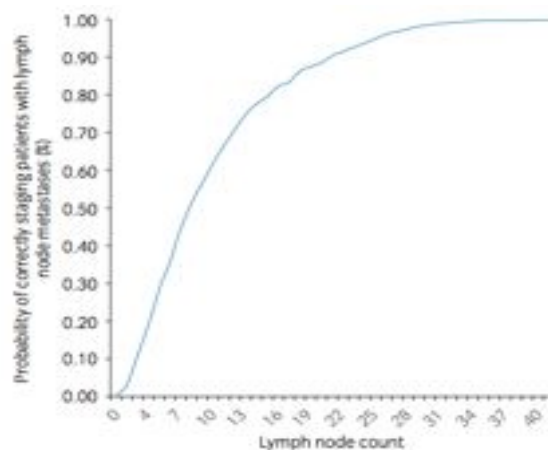
Does number of nodes contribute  
an effect?

### Lymph node count threshold for optimal pelvic lymph node staging in prostate cancer

Firas Abdollah,<sup>1,2\*</sup> Maxine Sun,<sup>1\*</sup> Rodolphe Thuret,<sup>1,3</sup> Claudio Jeldres,<sup>1</sup> Zhe Tian,<sup>1</sup> Alberto Briganti,<sup>2</sup> Shahrokh F Shariat,<sup>4</sup> Paul Perrotte,<sup>1</sup> Francesco Montorsi<sup>2</sup> and Pierre I Karakiewicz<sup>1</sup>

- Aim to assess the ideal number of lymph nodes to be removed to achieve optimal staging
- 20,789 patients with prostate cancer, 2004-2006, SEER
- Mean lymph node count was 6.4
- Overall rate of lymph node metastases was 2.5%
- Rate of lymph node metastases in low, intermediate and high risk tumours was 0.2, 1.5 and 6.7% respectively
- Rate of lymph node metastases was 3.5 and 6.7% in 10 and 20 lymph node count
- Removing 20 nodes would offer correct staging in 90% of patients

Abdollah F et al. Int J Urol 2012



**Fig. 2** Receiver operating characteristics-derived plot showing the relationship between lymph node count and the probability of correctly staging patients with pN1 in the entire cohort.

Abdollah F et al. Int J Urol 2012

How does the type of pelvic lymph node dissection contribute to your yield?

## Nodal yields from lymphadenectomy for prostate cancer – Lap. cohort

- Prior to 2005 patients had a limited PLND of the external iliac nodes if their risk of metastasis was >2%
- Post 2005 all patients had a standard lymph node dissection
- 174 had a limited dissection
- 595 had a standard dissection
- Standard PLND detected a higher rate of positive nodes than limited PLND (14.3% v 4.5% p=0.004)
- Standard PLND retrieved a higher number of lymph nodes than limited PLND (13 (IQR 9-18))v(9 (IQR 6-13)) p=<0.001
- For every ten patients with a limited dissection one patient with lymph node invasion will be missed

Touijer et al. BJUI 2010

## **Risk stratification from surgical series**

### **Lymph node dissection in men with PSA < 10**

- 231 patients, underwent EPLND
- N=26 (11%) had positive nodes, of these 81% had G1 7 in the specimen
- Lymph node positive rate in patients with only G1 6 was 3%

Schumacher et al. Eur Urol 2006

## Risk adapted approach is justified (n=5274)

	Low	Intermediate	High
PN1 1990 %	0	20	33
PN1 2010 %	3	7	44

Overall lymph node positive rate 13.8%  
No significant change in pre-op cancer characteristics

## Determinants of PSA progression in men who are lymph node positive

- Single surgeon series, 3264 patients
- 1982-2003 with EPLND
- 143 patients (4.4%) had nodal metastases
- 24 (16.8%) were free from PSA recurrence at median follow up 6 years
- Predictors of progression:
  - >15% positive nodes
  - Gleason score 8-10 and SVI were weaker predictors

Palapattu et al. J Urol 2004

## AUA Abstracts 2013

372:

### THE NUMBER OF POSITIVE NODES IS THE STRONGEST PREDICTOR OF CANCER SPECIFIC SURVIVAL IN PATIENTS TREATED WITH RADICAL PROSTATECTOMY FOR PATHOLOGICAL T3 PROSTATE CANCER

Paolo Dell'Oglio; Marco Bianchi; Andrea Gallina; Nazareno Suardi; Firas Abdollah; Alessandro Nini; Ettore Di Trapani; Manuela Tutolo; Fabio Castiglione; Umberto Capitanio; Francesco Montorsi; Alberto Briganti

- Premise previous studies have demonstrated that having 1 or 2 nodes is better than having 3 or 4 nodes in terms of cancer specific survival aimed to test this selectively in pt3 population
- 1562 patients rx with RP and ePLND between 1998 and 2012, mean no of nodes 17
- Patients stratified by SVI or not and N0, N1-2, N>2
- 990 (63.4%) , 366 (23.4), 206 (12.2%) were N0, N1a, N1b respectively median follow up 60 months
- Cancer specific survival at 5 and 10 years N0- 96 and 86, N1a – 93 and 78 , N1b – 78 and 61 ( P<0.02)
- SVI and N0 or N1a – no difference in survival between groups
- SVI and N1b – 77 + 61 (p<0.001) confirmed at MVA, HR's 14.2 and 2.1 for patients with and without SVI respectively
- CONCLUSION HIGH NODAL BURDEN (+/-SVI) ASSOCIATED WITH POOR PROGNOSIS

## AUA Abstracts 2013

373:

### PATHOLOGICAL NODAL STAGING SCORE FOR PROSTATE CANCER: A TOOL TO ADDRESS ADEQUATE NODAL DISSECTION IN MEN TREATED WITH RADICAL PROSTATECTOMY

Alberto Briganti; Alessandro Nonis; Chiara Brombin; Umberto Capitanio; Andrea Gallina; Alessandro Nini; Marco Bianchi; Massimo Freschi; Claudio Doglioni; Patrizio Rigatti; Louis Kluth; Felix Chun; Shahrokh Shariat; Francesco Montorsi; Clelia Di Serio

- Interesting concept – developing a nomogram to decide if someone is truly n0 after a lymph node dissection depending on the number of nodes taken
- Advocates of extended lymph node dissection Extended PLND consisted of removal of obturator, external iliac, hypogastric ± presacral and common iliac lymph nodes
- 5353 patients RP and EPLND 1987-2012 single centre , 2002 path staging, patients stratified according to path stage – beta-binomial model?!
- 799(14.9%) had LNI, median number of nodes 16 same for all stages
- Ascertained the probability of missing a node decreases with increasing numbers of nodes examined ( 48% with 5 nodes, 29% with 10 nodes, 15% if 20 nodes and 8% if 30 nodes )
- Proportion of positive nodes increased with T stage – 2.2%, 15.3%, 56.7% for pT2,PT3a, pT3b/4.
- Probability of being node negative with 10 nodes taken: 84, 89, 80% vs. 91,94, 88% if 20 nodes are taken
- CONCLUSIONS- HIGH NUMBER OF NODES (20) NEED TO BE TAKEN TO ACHIEVE HIGH STAGING ACCURACY EVEN IN LOW RISK STAGES – THIS SHOULD BE TAKEN ACCOUNT OF IN RECURRING PATIENTS

## **What is the therapeutic effect of PLND?**

### **Evidence**

- There is no level one evidence that extended or limited PLND improves survival for men with prostate cancer
- Several retrospective series demonstrate no survival benefit to pelvic lymph node dissection



AUA 2013 abstracts  
**Prostate Cancer: Localized (VI)**  
**Moderated Poster**

1346:

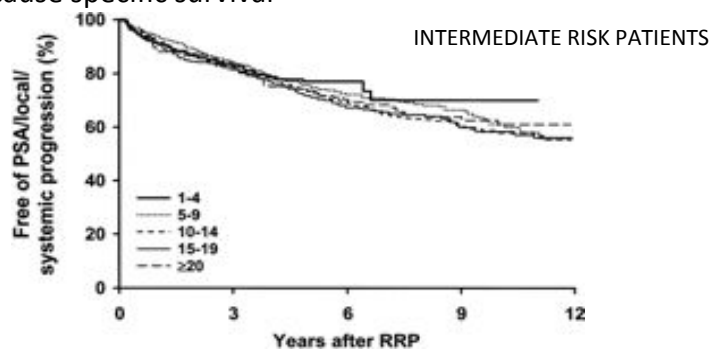
[A nested, case-control, matched study examining the significance of pelvic lymphadenectomy during radical prostatectomy](#)

Michelle Chang; Christopher Sherman; Laurence Klotz; Robert Nam

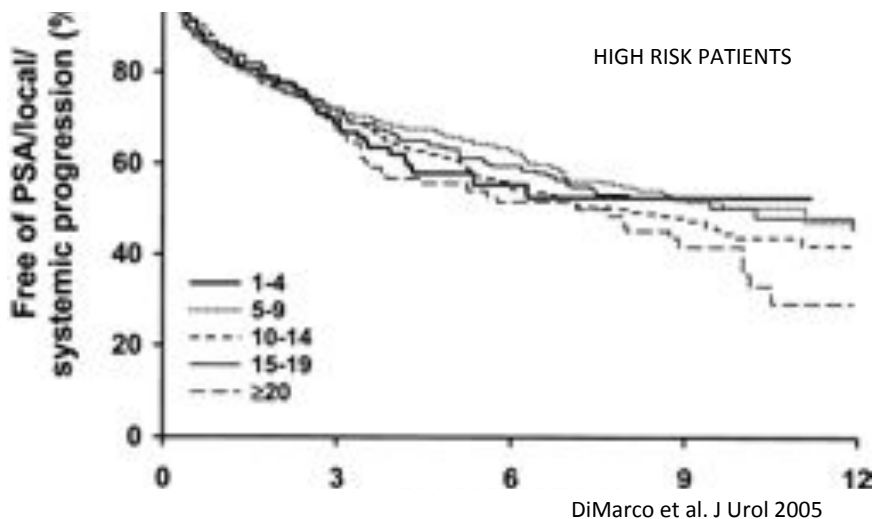
- Nam senior author
- 1667 historical cohort patients
- After exclusions case-control study
- 335 patients matched in each group
- 1998-2010 open +/-plnd
- Primary outcome prostate cancer specific survival
- Reasonably matched 100% for gleason and stage, 95% for PSA ( caveat not for volume of tumour )
- D'amico risk low-21 intermediate-185 high – 129
- 11 patients had positive nodes (10 high risk, 1 intermediate risk)
- Median lymph nodes 6 at plnd
- Conclusion NO DIFFERENCE IN CANCER SPECIFIC SURVIVAL

## Value of extent of lymphadenectomy for pTxN0

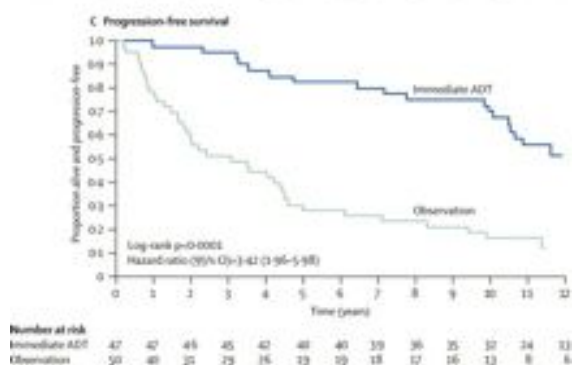
- 7036 patients no association between number of lymph nodes removed and PSA progression, systemic progression or all cause specific survival



## Extent of lymphadenectomy for pTxN0



## Value of unspecified lymphadenectomy in node positive patients



Messings control arm – freedom from biochemical recurrence

Messing et al. Lancet Oncol 2006

## Value of increasing nodes taken at PLND on survival

- The SEER database was examined – cohort of 13025 men who underwent radical prostatectomy
- Lymph adenectomy was performed in 71% of patients with 9% harbouring metastatic nodes.
- Patients with lymph node metastases tended to have a greater number of nodes removed (13 nodes versus 9,  $p < 0.0001$ )
- If greater than 4 lymph nodes were taken patients had a lower risk of a prostate cancer specific death at 10 years
- Extensive node dissection seemed to reduce the long term risk of prostate cancer related death even in patients with negative lymph nodes.

Joslyn et al. Urology 2006  
Masterson et al. J Urol 2006

## EPLND v PLND on survival

- Non randomised BUT two surgeon study
- 2135 EPLD v 1865 PLND
- EPLND removed more nodes – mean 11.6 v 8.9 ( $p < 0.0001$ )
- EPLND detected more node +ve - 3.2% v 1.1% ( $p < 0.0001$ )
- If the lymph node positive disease involved less than 15% of nodes taken the 5 year biochemical recurrence rate for EPLND was 43% v 10% (0.01)

Allaf et al. J Urol 2004  
Bader J Urol 169 2003

## Pathology Effect

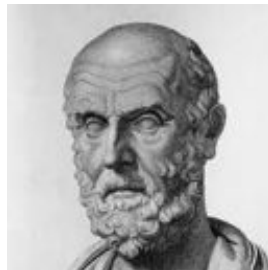
### The Pathology Effect

- Pelvic lymph nodes from 274 patients with 1997 tnm stage t3 disease were reviewed
- 180 reviewed who had lymph node negative disease on routine pathology
- Nodes were reviewed with immunohistochemistry and **13%** harboured micrometastatic disease
- When re-reviewed these patients had significantly higher recurrence rates

Pagliarulo et al. J Clin Oncol 2006

## Hippocrates

- Do good or Do no harm



### How many lymphadenectomies does it take to cure one patient?

- Assuming removal of 100% of the nodes causes a 15% decrease in clinical events
- For patients with 1% likelihood of lymph node metastasis the NNT was 667
- For patients with a 10% likelihood of lymph node metastasis the NNT was 67

Klein et al. Eur Urol 2008

## CAVEAT

- We have effective adjuvant treatment to improve survival if patients appropriately staged
- ADT
- ADT and Radiation

Briganti et al. Eur Urol 2011  
Messing et al. Lancet Oncol 2006

What is the incidence of complications  
in patients undergoing pelvic lymph  
node dissection?

## Lymphocele

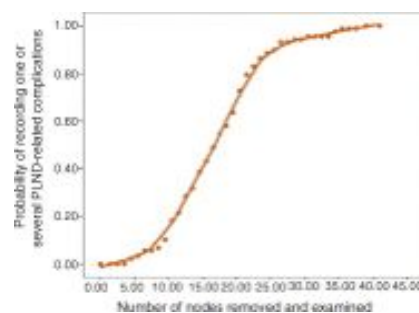
**Table 1**  
**Lymphocele Rates in Contemporary Radical Prostatectomy Series**  
**With Limited Versus Extended Pelvic Lymph Node Dissection**

Study	Limited	Extended
Allaf et al. <sup>7</sup>	—	3 (0.1)
Briganti et al. <sup>26</sup>	9 (4.6)	79 (10.3)
Clark et al. <sup>21</sup>	1 (0.8)	3 (2.4)
Heideneich et al. <sup>19</sup>	9 (9)	9 (10.6)
Musch et al. <sup>2</sup>	29 (3.3)	41 (9.4)

Values are number represented as whole numbers with the percentage in parenthesis.

## Other complications

- DVT / PE – 0-8%
  - ? Association with lymphoceles
- Ureteric injury - < 1%
- Neurologic injury
- Vascular injury



Briganti et al Eur Urol 2006

## Additional costs

- ePLND will add at least between 30-40 min to surgical time depending on surgeon experience
- US study in 1990's \$960 per PLND
- European study in 2000's €3,994 per PLND
- Pathological analysis costs 1990's - £550 per patient

Briganti et al. Eur Urol 2006  
Campbell et al. Urology 1995  
Hovels et al. Eur Radiol 2004  
Young et al. J Clin Pathol 1999;52:925-7

## Conclusions



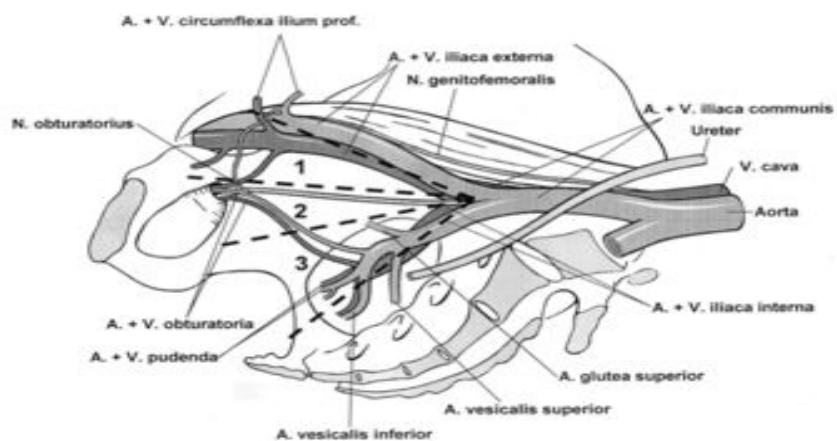
## Conclusions - 1

- There is little prospective data in this space
- Low risk prostate cancer patients are unlikely to benefit significantly from PLND
- Imaging unlikely to practically help risk stratify patient for PLND in most cases
- Nomogram risk assessment is reasonable pre surgery

## Conclusions - 2

- EPLND is the gold standard for optimal staging however there is a morbidity and cost attached
- Although lymph node positive rates are currently low but this may change with recent public health announcements
- If doing a PLND perform bilateral approach
- There may be an associated survival benefit but we await prospective study results
- Consult with your pathologist regarding their local practice

## Appropriate extent of ePLND



Boundaries of extended lymph node dissection and subdivision into 3 different locations including external iliac vein, obturator fossa and internal iliac (hypogastric) artery.<sup>15</sup>