



The Potential Usefulness of Pre and Post Operative Risk Group Stratification in Predicting PSA Failure after Radical Prostatectomy for Localised Prostate Cancer

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Abstract

Background: There is no clear cut way of predicting exactly prior to radical prostatectomy which patients would subsequently develop Biochemical failure post operatively.

Aims: To investigate the usefulness of Risk Group stratification based upon: pre-operative PSA, clinical staging and Gleason score assessment of prostate biopsy specimens taken at Trans-rectal ultrasound of prostate in predicting PSA failure post-operatively.

To ascertain whether or not risk group stratification using radical prostatectomy specimen would be more useful in predicting PSA failure.

Patients and Methods: Fifty patients underwent radical prostatectomy as treatment for localised adenocarcinoma of prostate between 1999 and January 2006. The patients were followed up over a period of time ranging from 4 month to 7 years. The clinical records were reviewed to ascertain the PSA failure in the aforementioned risk groups.

Statistical analysis was done to compare the PSA failure rates in both risk stratification groups.

Results: Pre-operative Risk Group Stratification 19%, 19%, 37.8% of patients in the low-, intermediate-, and high- risk groups developed PSA failure..

Post-operative Risk Group Stratification

None of the 10 and 17 patients in low-risk, and intermediate-risk groups respectively developed PSA failure and 11 out of 23 patients (48%) in the high risk group developed PSA failure.

Conclusions: Post-operative Risk Group Stratification statistically is more reliable in predicting PSA failure.

Patients in the post-operative high risk group would most likely develop PSA failure and should be advised to have adjuvant therapy.

Patients in the low-risk group most likely would not develop biochemical failure and may therefore not require adjuvant therapy.

Introduction

Radical prostatectomy has gained wide acceptance throughout the world as one of the most useful available treatment modalities for localised prostate cancer. But unfortunately, about a third of men treated with radical prostatectomy later experience progression of their disease. Usually, the first indication that the disease has progressed or is progressing is a subsequent detectable level of serum prostate specific antigen (PSA) measured months or years after the radical prostatectomy. It would be helpful if practitioners could find a way of identifying or predicting accurately at an earlier stage those patients who would subsequently develop PSA failure or PSA recurrence then such patients can be given adjuvant therapy early with the aim of preventing or delaying PSA and tumour recurrence. This study has retrospectively assessed the potential usefulness and reliability of the pre and post operative Risk-Group-Stratification based upon a combination of serum PSA, Gleason Score and stage of tumour in predicting subsequent PSA failure / recurrence after radical prostatectomy for localized prostate cancer in our initial 50 patients who undergone radical prostatectomy for localised disease.

Patients Materials and Methods

Patients

A retrospective analysis was done using the clinical records; laboratory results; radiology records of all the initial 50 patients with localised adenocarcinoma of prostate who underwent standard radical retro-pubic prostatectomy between 1999 and 2005 at North Manchester General Hospital. The operation was performed by one consultant Urologist.

All the patients were pre-operatively assessed with initial outpatient consultation which included: clinical history taking; clinical examination including digital

rectal examination to assess the prostate gland; Serum PSA checks; trans-rectal ultrasound scan of prostate and prostate biopsies; CT scan/ MRI scan of abdomen and pelvis. The results of the patient's histology reports, CT scans and the patients' general state of health and co-morbidities were discussed at a Multi-Disciplinary Team Meeting and the options of management outlined. All the patients were seen again in the out-patients clinic and the options of management and outcome of all the management options were discussed including complications and recurrence. All the patients chose radical prostatectomy and after counselling underwent radical prostatectomy pursuant to which they were followed up at regular intervals with a mean follow up of 28.7 months (range 4 months to 7 years).

The average age range of the patients was 62 years; 1 patient was aged >70 years; 14 patients were aged between 66 and 70 years; 15 patients were aged between 61 and 65 years; 13 were aged between 56 and 60 years; 6 were aged between 50 and 55 years; 1 was less than 50 years old.

Methods

The following data were recorded:

The initial serum PSA at the time of trans-rectal ultrasound scan of prostate and all PSA values from the onset up to the end of study

The clinical stage of the tumour determined at time of the pre-operative counselling based upon the clinical examination findings, trans-rectal ultrasound scan finding, CT / MRI scan finding and histology report.

The pre-operative Gleason grade and score of the tumour based upon the Trans-rectal ultrasound scan biopsy specimen

The post-operative Gleason grading and score of the tumour based upon results of histological examination of the radical prostatectomy specimens.

The clinical stage of the tumour based upon the intra-operative findings and histological examination findings of the radical prostatectomy specimens.

Based upon the results of the patients serum PSA, pre-operative clinical stage (or post-operative clinical stage in the case of radical prostatectomy specimen) and Gleason score of the trans rectal ultrasound biopsy specimen (or the radical prostatectomy specimen for post-prostatectomy stratification) the patients were allocated to three different groups as low risk; intermediate risk and high risk groups which were defined as:

The outcome of the patients were recorded as (a) no biochemical failure, (b) biochemical failure [PSA value

of 0.2 ng/ml and second PSA value higher than 0.2 ng/ml or two consecutive PSA rises above the PSA nadir. The time interval between the retro-pubic radical prostatectomy and the Biochemical (PSA) failure were recorded including any other patient outcome regarding progress of tumour or death.

Analysis of data included calculation of percentage of patients in each risk group that subsequently developed Biochemical (PSA) failure. Statistical analyses of the results were done using sure start to compute the following analyses: Nominal Independence, Anova, Linear Trend, Nominal Association, and Ordinal.

Results

During the period of follow-up 11 patients (22%) developed PSA failure and one of these patients died of his prostate cancer but the remaining 10 patients were free of clinical disease and they were either referred for adjuvant therapy or have been receiving adjuvant therapy. The only patient who died of his prostate cancer was initially treated with radical radiotherapy prior to his radical prostatectomy however, he developed PSA (Biochemical) failure and he then opted to undergo radical prostatectomy. He also continued to be on hormonal treatment but died. With regard to the ten patients who developed PSA failure the outcomes were as follows:

- One patient developed PSA failure by the 6th post operative period with PSA values of 0.681 ug/L, [ng/ml], and 1.95 ug/L, [ng/ml]. He was referred to the Oncologist and has been treated by radical radiotherapy and he is also receiving hormonal therapy.
- One patient developed PSA failure at 4 months with serum PSA of 0.22 ug/L. He was referred to the oncologist and he had undergone radical radiotherapy and is receiving hormonal treatment as well. His last serum PSA was < 0.050 at the time of the study.
- One patient developed PSA failure at 33 months and has received radical radiotherapy as well as he is on hormonal treatment. His last 3 serum PSAs were
- One patient developed PSA failure at 4 months post operatively and was referred to the oncologist following which he received radical radiotherapy. His last serum PSA was >0.050 ug/L.
- One patient developed PSA failure 7 years post operatively and had just been referred to the oncologist.
- One patient developed PSA failure 4 years post operatively and had just been referred to the oncologist.
- One patient developed PSA failure 3 years post operatively and was referred to the oncologist following which he received radical radiotherapy. His

last 3 serum PSA levels have been:

- One patient developed PSA failure 8 months post operatively; he was referred to the oncologist and he received radical radiotherapy; his last 2 serum PSA levels were
- One patient developed PSA failure 2 months post operatively; he was referred to the oncologist and he received radical radiotherapy and is also on hormonal treatment. His last 3 serum PSA levels were
- One patient developed PSA failure 2 years post operatively; he was referred to the oncologist and he received radical radiotherapy. His last serum PSA was

Out of the 50 patients who underwent radical prostatectomy 21 were assigned to the low risk group, 21 were assigned to the intermediate risk group and 8 were assigned to the high risk group based upon risk group stratification using the pre-operative PSA, Gleason score of the pre-operative trans-rectal ultrasound scan biopsy specimen and the clinical stage of the tumour. With regard to 21 patients assigned to the low risk group, 4 patients developed PSA (biochemical) failure subsequently and 17 did not develop PSA (biochemical) failure. Out of the 21 patients assigned to the intermediate risk group, 4 patients developed PSA (biochemical) failure and 17 patients did not develop PSA failure. Out of 8 patients assigned to the high risk group, 3 developed PSA failure and 5 did not develop PSA failure. These results showed that in comparison with patients who were assigned to the low or intermediate risk group, patients who were assigned to the high risk group had just under double the percentage PSA failure rate (37.55 [high risk group] versus 19% [low and intermediate risk group] (see table 1).

Various statistical analyses were done in relation to PSA failure and non failure based upon the pre-operative trans-rectal ultrasound prostate biopsy specimens using sure start including Nominal Independence, Anova, Linear trend, Nominal association, and Ordinal which revealed that the differences in outcome were not significant as shown in the detailed results below:

With regard to risk-group stratification based upon the radical prostatectomy specimen: Out of the 50 patients, 10 patients were assigned to the low risk group and none of the patients developed PSA failure; 17 were assigned to the intermediate risk group and none of them developed PSA failure; 23 were assigned to the high risk group and 11 (48%) developed PSA failure (see table 2).

Various statistical analyses were done in relation to the outcome of PSA failure and non failure based upon the risk-group stratification using the radical

prostatectomy specimen including: Nominal Independence, Anova, Linear trend, Nominal association, and ordinal which confirm that the difference in outcome is statistically significant. Data on the statistical analyses with sure start is shown below:

Discussion

The judgement of which patients are at high risk for failure after radical prostatectomy has traditionally been based largely upon the final pathologic stage [1]. Partin and associates [2] stated that final pathologic state alone is a problematic variable for judging high-risk disease in view of the fact that some patients with apparently organ-confined cancer will later develop disease recurrence, and many patients with non-organ-confined cancer will remain disease-free [3].

It has been stated that not all patients with prostatic capsular invasion (PCI) or seminal vesicle involvement, are destined to have disease recurrence after radical prostatectomy. [4], [5], [6], [7], [8], [9]. In view of this it would be argued that the use of individual pathologic features related to a prostate cancer would be insufficient to estimate the risk of recurrence and that there is the need to combine a number of pathologic factors as a risk group stratification approach.

Stein and associates [10] stated that pursuant to radical prostatectomy designed to cure the patient of his cancer, the serum PSA level should become undetectable.

Partin and associates [8] intimated that measurable levels of PSA after surgery provide evidence of disease recurrence that may precede detection of local or distant recurrence by many months to many years.

The use of PSA test has become an invaluable blood tumour marker and follow-up tool ensuing definite treatment. The serum level of PSA pursuant to a radical prostatectomy of locally organ-confined prostate cancer should fall to undetectable levels. In view of the fact that the half life of PSA in the blood is 3 days, the lowest level of serum PSA should be reached four to six weeks after complete excision of surgery [11], [12].

If the PSA is still detectable in serum after 6 weeks, this may be indicative that there is residual cancer. Post-operative PSA is defined as undetectable based upon the lowest residual cancer detection limit of each commercial assay kit of the PSA test but it is not standardized and ranges from 0.1 to 0.6 ng/ml even though, 0.2 or 0.3 ng/ml is most commonly used [13],

[14], [15], [16].

Amling and associates [17] compared and analyzed values of PSA of 0.2 and 0.4 ng/ml and the outcomes showed disease progression-free rates at five and ten years of 14% and 16%, difference respectively. Whether or not the determination is set at a single PSA reading of ≥ 0.4 ng/ml or 2 PSA tests of ≥ 0.4 ng/ml, the respective five- and ten- year prognoses still differed at 7% and 18%. Therefore some patients whose PSA falls to 0.3 to 0.4 ng/ml, or with an occasional PSA of >0.4 ng/ml, might still be free of recurrence.

The general consensus of opinion has been leaning towards using serum-PSA of 0.4 ng / ml as: the acceptable biochemical diagnostic PSA-cut-off point for recurrence of the prostatic carcinoma. However, Yang [18] is of the opinion that 2 or more PSA values showing an increase are necessary before beginning additional therapy and following up with further confirmation is also required.

Iselin and associates [19] have stated that when PSA values of patients rise after surgery and biochemical recurrence is diagnosed, if treatments are not administered in a timely manner, then the future clinical discovery of local recurrence or metastasis can range from 7 months to 6 years, while the estimated period of death from prostate cancer can range from 5 to 12 years.. At this stage, CT scan, magnetic resonance imaging (MRI), and bone scan are all diagnostically ineffective [20].

The results of this study are of clinical significance in that it has shown that:

Patients assigned to the high risk group have a higher chance/risk of developing PSA failure post operatively.

The risk group stratification based upon the pre-operative trans-rectal ultrasound scan prostate biopsy stratification may provide a useful guide to PSA failure however, this may not be an accurate indicator of outcome in that a number of patients who were assigned to the low-risk group who developed PSA failure upon subsequent examination of the radical prostatectomy specimens (whole prostate) had up-grading and or up-staging of their tumours upon.

Risk group stratification based upon the radical prostatectomy is useful way of identifying the group of patients who would most likely develop PSA failure from those who would not in that none of the patients in the low-risk group and intermediate-risk group developed PSA failure and 11 out of 23 patients (48%) of patients assigned to the high risk group developed PSA failure.

Conclusions

Risk-group stratification of patients with localised prostate cancer is a useful way of predicting the likelihood of the subsequent development of PSA (biochemical) failure after radical prostatectomy.

Risk-group stratification based upon the pre-operative prostate biopsy specimen may be an indicator of subsequent PSA failure post-operatively due to upgrading or upstaging which may occur after examination of the radical prostatectomy specimen.

Risk-group stratification based upon the radical prostatectomy specimen would be most useful in predicting PSA failure.

Patients assigned to the high-risk group after examination of their radical prostatectomy specimens would belong to the group who should be given adjuvant therapy because of the high likelihood of subsequent PSA failure in this.

Patients assigned to the low- and intermediate- risk group based upon examination of the radical prostatectomy specimens would not need to have adjuvant therapy in view of the unlikelihood of their subsequent development of PSA failure.

References

1. Michael W. Kattan, Thomas M. Wheeler, Peter T. Scardino. Postoperative Normogram for Disease Recurrence After Radical Prostatectomy for Prostate Cancer. *Journal of Clinical Oncology* 1999; 17(5): 1499-1519 can be found at <http://jco.ascopubs.org/cgi/content/full/17/5/1499>
2. Patin A W, Kattan M W, Subong E N P, Walsh P C, Wojno K J, Osterling J E, Scardino P T, Pearson J D. Combination of prostate-specific antigen, clinical stage, and Gleason score to predict pathological stage in men with localized prostate cancer: A multi-institutional update. *JAMA* 1997; 277 (18): 1445-1451
3. Kattan M W, Stapleton A M F, Wheeler T M, Scardino P T. Evaluation of a normogram for predicting pathological stage of men with clinically localized prostate cancer. *Cancer* 1997 Feb; 79(3): 528-537
4. Wheeler T M, Dilliogluligil O, Kattan M W, Arakawa A, Suyama K, Ohori M, Scardino P T. Clinical and pathologic significance of the level and extent of capsular invasion in clinical stage T1-2 prostate cancer. *Hum Pathol* 1998 Aug; 29 (8): 856-862

5. Ohori M, Scardino P T, Lapin S L, Seale-Hawkins C, Link J, Wheeler T M. The mechanisms and prognostic significance of seminal vesicle involvement by prostate cancer. *Am J Surg Pathol* 1993 Dec; 17 (12): 1252-1261
6. Pound C R, Partin A W, Epstein J I, Walsh P C. Prostate-specific antigen after anatomic radical retropubic prostatectomy. *Urol Clin North Am* 1997 May; 24 (2): 395-406
7. Trapasso J G, deKernion J B, Smith R B, Dorey F. The incidence and significance of detectable levels of serum prostate specific antigen after radical prostatectomy. *J Urol* 1994 Nov; 152 (5 Pt 2): 1821-1825
8. Partin A W, Pound C R, Clemens J Q, Epstein J I, Walsh P C. Serum PSA after anatomic radical prostatectomy: The Johns Hopkins experience after 10 years. *Urol Clin North Am* 1993 Nov; 20 (4): 713-725
9. Epstein J I, Pizov G, Walsh P C. Correlation of pathologic findings with progression after radical retropubic prostatectomy. *Cancer* 1993; 71: 3582-3593
10. Stein A, deKernion J B, Smith R B, Dorey F, Patel H. Prostate specific antigen levels after radical prostatectomy in patients with organ confined and locally extensive prostate cancer. *J Urol* 1992 Mar; 147 (3 pt 2): 942-946
11. Osterling J E, Chan D W, Epstein J L, Kimball A W Jr, Bruzek D J, Rock R C, Brendler C B, Walsh P C. Prostate specific antigen in the preoperative evaluation of localized prostate cancer treated with radical prostatectomy. *J Urol* 1988 Apr; 139 (4): 766-772
12. Partin A W, Osterling J E. The clinical usefulness of prostate specific antigen: update 1994. *J Urol* 1994; 152: 1358-1368
13. Presti JC Jr, Shinohara K, Bacchetti P, Tigrani v, Bhargava V. Positive fraction of systematic biopsies predicts risk of relapse after radical prostatectomy. *Urology* 1998; 52: 1079-1084
14. Freedland S J, Wieder J A, Jack G S, Dorey F, deKernion J B, Aronson W J. Improved risk stratification for biochemical recurrence after radical prostatectomy using novel risk group system based on prostate specific antigen density and biopsy Gleason score. *J Urol* 2002; 168: 110-115
15. Moul J W, Connelly R R, Lubeck D P, Bauer J J, Sun L, Flanders S C, Grossfield G D, Carroll P R. Predicting risk of prostate specific antigen recurrence after radical prostatectomy with the center for prostate disease research and cancer of the prostate strategic urologic research endeavour database. *J Urol* 2001 Oct; 166 (4): 1322-1327
16. Hull G W, Rabbani F, Abbas F, Wheeler T M, Kattan M W, Scardino P T. Cancer control with radical prostatectomy alone in 1,000 consensus patients. *J Urol* 2002; 167: 528-534
17. Amling C L, Bergstralh E J, Blute M L, Slezak J M, Zincke H. Defining prostate specific antigen progression after radical prostatectomy. What is the most appropriate cut-Off point? *J Urol* 2001; 165: 1146-1151
18. Yang C R. The Management of PSA Failure (Biochemical recurrence) after Radical Prostatectomy for localized prostate cancer: Radiation or Hormonal Therapy? *JTUA* 2008; 19: 83-86
19. Iselin C E, Robertson J E, Paulson D F. Radical perineal prostatectomy: oncological outcome during a 20-year period. *J Urol* 1999; 161: 163-168
20. Cher M L, Bianco F J Jr, Lam J S, Davis L P, Grignon D J, Sakr W A, Banerjee M, Pontes J E, Wood D P Jr. Limited role of radionuclide bone scintigraphy in patients with prostate specific antigen elevation after radical prostatectomy. *J Urol* 1998 Oct; 160 (4): 1387-1391

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Authors contributions

The study was designed by Mr Anthony K-G Venyo who adopted the North West Regional Prostate Cancer Audit proforma and who discussed the audit project with Drs Sarang Shah and Shahid Imran, Mr Douglas Barnes as well as the Audit Department of North Manchester General Hospital. Mr Anthony Kodzo-Grey Venyo explained in detail to Drs Sarang Shah and Sharid Imran the Gleason Grading / Scoring System, as well as the Staging of Prostate Cancer to Drs Sarang Shah and Shahid Imran. All the Radical prostatectomies were performed by Mr D G Barnes and Mr Anthony Kodzo-Grey Venyo assisted at some of the operations as well as reviewed some of the

patients post-operatively. Mr Anthony Kodzo-Grey Venyo supervised Drs Sarang shah and Dr Shahid Imran to collect and enter all the data. Mr Anthony Kodzo-Grey Venyo cross checked all the clinical entry, laboratory results, radiology results, the PSA levels, Gleason Scores, clinical staging and patient outcome as the subsequent PSA levels entered by both Drs Shah and Imran and all three were in agreement regarding the entries of every patient. The raw data was given to the audit Department for entry into a spread sheet format and analysis of Data without knowledge of all the clinicians. Ruth Gordon did all the analyses and entry of the results with the exception of the statistical analyses. Mr Douglas Barnes reviewed all the patients at initial and subsequent follow-ups and Mr Anthony Kodzo-Grey Venyo also reviewed some of the patients at some stage in the follow-up of some of the patients. Mr Anthony kodzo-Grey Venyo wrote the manuscript which was then read by all authors who were in agreement of the contents. Dr Sarah Cotterill explained to Mr Anthony Kodzo-Grey Venyo the appropriate statistical analyses pertinent to our data based upon the numbers involved. Dr Sarah Cotterill did all the statistical analyses in the presence of Mr Anthony Kodzo-Grey Venyo and cross checking that all the results were correctly entered for the statistical analyses.

Illustrations

Illustration 1

Statistical analyses of outcome (PSA failure and non failure) post radical prostatectomy for localised prostate cancer in relation to Risk Group Stratification of trans-rectal ultrasound scan prostate biopsy specimens (biopsy specimens only) Contingency table analysis

Observed	17	4	21
Expected	16.38	4.62	
% of row	80.95%	19.05%	
% of col	43.59%	36.36%	42%
Observed	17	4	21
Expected	16.38	4.62	
% of row	80.95%	19.05%	
% of col	43.59%	36.36%	42%
Observed	5	3	8
Expected	6.24	1.76	
% of row	62.5%	37.5%	
% of col	12.82%	27.27%	16%
Total	39	11	50
% of n	78%	22%	

TOTAL number of cells = 6
Warning: 3 out of 6 cells have EXPECTATION < 5
<u>NOMINAL INDEPENDENCE</u>
Chi-square = 1.333389 DF = 2 P = 0.5134
G-square = 1.205117 DF = 2 P = 0.5474
Fisher-Freeman-Halton exact P = 0.4814
<u>ANOVA</u>
Chi-square for equality of mean column scores = 0.77118
DF = 1 P = 0.3799
<u>LINEAR TREND</u>
Sample correlation (r) = 0.125453
Chi-square for linear trend (M ²) = 0.77118
DF = 1 P = 0.3799

<u>NOMINAL ASSOCIATION</u>			
Phi = 0.163303			
Pearson's contingency = 0.161168			
Cramér's V = 0.163303			
<u>ORDINAL</u>			
Goodman-Kruskal gamma = 0.223022			
Approximate test of gamma = 0:	SE = 0.285145	P = 0.4341	95% CI = -0.335851 to 0.781895
Approximate test of independence:	SE = 0.297551	P = 0.4535	95% CI = -0.360168 to 0.806212
Kendall tau-b = 0.107387			
Approximate test of tau-b = 0:	SE = 0.141751	P = 0.4487	95% CI = -0.17044 to 0.385214
Approximate test of independence:	SE = 0.143274	P = 0.4535	95% CI = -0.173425 to 0.388199

Illustration 2

Statistical analyses of outcome (PSA failure and non failure) based upon Risk group stratication of radical prostatectomy specimens(whole prostate)\nContingency table analysis

Observed	10	0	10
Expected	7.8	2.2	
% of row	100%	0%	
% of col	25.64%	0%	20%
Observed	17	0	17
Expected	13.26	3.74	
% of row	100%	0%	
% of col	43.59%	0%	34%
Observed	12	11	23
Expected	17.94	5.06	
% of row	52.17%	47.83%	
% of col	30.77%	100%	46%

Total	39	11	50
% of n	78%	22%	
TOTAL number of cells = 6			
Warning: 2 out of 6 cells have EXPECTATION < 5			
<u>NOMINAL INDEPENDENCE</u>			
Chi-square = 16.555184 DF = 2 P = 0.0003			
G-square = 20.849518 DF = 2 P < 0.0001			
Fisher-Freeman-Halton exact P = 0.0002			
<u>ANOVA</u>			
Chi-square for equality of mean column scores = 12.775342			
DF = 1 P = 0.0004			
<u>LINEAR TREND</u>			
Sample correlation (r) = 0.510609			
Chi-square for linear trend (M ²) = 12.775342			
DF = 1 P = 0.0004			

<u>NOMINAL ASSOCIATION</u>			
Phi = 0.575416			
Pearson's contingency = 0.498742			
Cramér's V = 0.575416			
<u>ORDINAL</u>			
Goodman-Kruskal gamma = 1			
Approximate test of gamma = 0:	SE = 0	P = *	95% CI = * to *
Approximate test of independence:	SE = 0.218966	P < 0.0001	95% CI = 0.570834 to 1.429166

Kendall tau-b = 0.509847			
Approximate test of tau-b = 0:	SE = 0.071717	P < 0.0001	95% CI = 0.369283 to 0.65041
Approximate test of independence:	SE = 0.111639	P < 0.0001	95% CI = 0.291038 to 0.728655

Illustration 3

Table 1 and Table 2

PSA (Biochemical) Failure rate following radical prostatectomy in relation to pre-radical prostatectomy (post-trans-rectal ultrasound scan biopsy) risk group stratification. Outcome of 50 patients who underwent radical prostatectomy for localized prostate cancer between December 1999 and January 2006 with a follow up ranging from 4 months to 7 years and mean follow up of 28.7 months

Risk Group	PSA Non Failure (Normal PSA)	PSA Failure	Total	Percentage Failure
Low Risk	17	4	21	19%
Intermediate Risk	17	4	21	19%
High Risk	5	3	8	37.5%

PSA (Biochemical) Failure rate following radical prostatectomy in relation to post radical prostatectomy risk group stratification. Outcome of 50 patients who underwent radical prostatectomy for localized prostate cancer between December 1999 and January 2006 with a follow up ranging from 4 months to 7 years and mean follow up of 28.7 months.

Risk Group	PSA Non Failure (Normal PSA)	PSA Failure	Total	Percentage Failure
Low Risk	10	0	10	0%
Intermediate Risk	17	0	17	0%
High Risk	12	11	23	48%

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