PATTERNS OF FAILURE FOLLOWING THE BRACHYTHERAPY MANAGEMENT OF PROSTATE CANCER

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Distant and local recurrence in patients with biochemical failure after prostate brachytherapy

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and Nelson N. Stone

PROFILE OF PSA FAILURES

Percent of patients

184 PSA failures

- Low risk: 22%
- Intermediate risk: 14%
- High risk: 64%

Legend:
- Low risk
- Intermediate risk
- High risk
PROFILE OF PSA FAILURES

PERCENT OF PTS

Doubling Times

- <=3 MOS
- >3 - 6 MOS
- >6 - 10 MOS
- >10 MOS

184 PSA FAILURE PTS

21% 17% 16% 46%
PREDICTORS OF A POSITIVE BIOPSY

PERCENT POSITIVE BIOPSY

106 BIOPSY PATIENTS

PSA DOUBLING TIMES
- <=3 MOS
- >3 - 6 MOS
- >6 - 10 MOS
- > 10 MOS

P= 0.001
PREDICTORS OF A POSITIVE BIOPSY

PERCENT POSITIVE BIOPSY

106 biopsy patients

BED\(\leq 150\):
- 44%

BED\(> 150\):
- 24%

\[P = 0.03\]
PREDICTORS OF A POSITIVE BIOPSY

PERCENT POSITIVE BIOPSY

P<0.0001
DISTANT METASTASES

- 37 patients developed clinical metastases
- 14/37 underwent post-treatment prostate biopsy. All were negative.
- 10 year actuarial freedom from developing distant metastases was 76%
EFFECT OF TIME OF PSA FAILURE ON DISTANT METASTASES

P = 0.0001

EFFECT OF PSA DOUBLING TIME ON THE DEVELOPMENT OF DISTANT METASTASES

EFFECT OF GLEASON SCORE ON DISTANT METASTASES

SCORE ≤ 6  89%
SCORE 7   75%
SCORE 8 – 10  50%
P<0.0001

EFFECT OF RISK GROUP ON DISTANT METASTASES

INT RISK 96%
LOW RISK 85%
HIGH RISK 69%

P = 0.01

EFFECT OF TREATMENT GROUP ON DISTANT METASTASES

- TRIMODALITY: 35%
- IMP+ HRM: 88.5%
- IMPLANT ALONE: 93.5%

Results: Prostate was the most common first recurrence site in the low, intermediate and high risk groups with an 8-year cumulative incidence of 3.5%, 9.8% and 14.6%, respectively. The 8-year risk of isolated pelvic lymph node relapse as the first recurrence site was 0%, 1.0% and 3.3%, respectively. In the 474 patients with clinically detected recurrence the most common first recurrence site was local in 55.3%, bone in 33.5%, pelvic lymph nodes in 21.3% and abdominal lymph nodes in 9.1%. Patients showed unique relapse distributions, including a pattern that was local in 41.6%, lymphotrophic in 9.7%, osteotrophic in 20.3% and multiorgan/visceral in 28.5%. Anatomical recurrence pattern was the strongest predictor of prostate cancer specific mortality on multivariate analysis of patients with clinically detected recurrence.
Anatomical Patterns of Recurrence Following Biochemical Relapse in the Dose Escalation Era of External Beam Radiotherapy for Prostate Cancer

Zachary S. Zumsteg, Daniel E. Spratt, Paul B. Romesser, Xin Pei, Zhigang Zhang, Marisa Kollmeier, Sean McBride, Yoshiya Yamada* and Michael J. Zelefsky†

Gray’s Test P<0.0001

<table>
<thead>
<tr>
<th>Prostate Cancer Specific Mortality (%)</th>
<th>Time from Biochemical Failure (years)</th>
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<tbody>
<tr>
<td>Local</td>
<td>0%</td>
</tr>
<tr>
<td>Lymphotrophic</td>
<td>0%</td>
</tr>
<tr>
<td>Osteotrophic</td>
<td>0%</td>
</tr>
<tr>
<td>Multifocal</td>
<td>0%</td>
</tr>
</tbody>
</table>

| Local      | 197 | 149 | 115 | 74  | 46  |
| Lymphotrophic | 46 | 41  | 32  | 24  | 17  |
| Osteotrophic    | 96 | 80  | 62  | 35  | 19  |
| Multifocal     | 135| 113 | 72  | 43  | 21  |
DISTANT RECURRENCE PATTERNS IN PATIENTS WITH BIOCHEMICAL FAILURE AFTER BRACHYTHERAPY

- 1992 – 2012 Mount Sinai Brachytherapy program
- 265 PATIENTS WITH PSA FAILURE

![Freedom From Distant Failure Graph]

- 5 yr 65.7%
- 10 yr 45%
RECURRENCE PATTERNS OUTSIDE OF THE PROSTATE

First sites of recurrence

- **bone**: 76%
- **nodal**: 19%
- **visceral organ**: 5%
2111 PATIENTS
TREATED FROM: 1990 – 2006
586 UNDERWENT POST TREATMENT PROSTATE BIOPSY
positive biopsy

BED VALUES
- <=150: 21%
- >150-200: 5.6%
- >200: 1.6%