INCIDENCE OF PROSTATE CANCER WITHIN SKELETAL MUSCLE AT THE PROSTATE APEX IN MEN UNDERGOING RADICAL PROSTATECTOMY

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(Presentation to be made by Dr. Samuel Washington)

Introduction: The apex of the prostate gland is an admixture of smooth muscle, capsular fibers and skeletal muscle. This is distinct from the other anatomically, well-defined borders of the prostate gland. In the setting of an apical tumor, margin status after resection may be unclear as cancer can involve the skeletal muscle at the apex. The presence of prostate cancer within skeletal muscle identified in apical margin sections of radical prostatectomies has been noted previously but the incidence and its impact on biochemical recurrence have not been well described.

Material and Methods: This retrospective cohort study reviewed radical prostatectomy (RP) specimens from men with clinical T1/2 disease who underwent RP between 2004-2010 to evaluate the presence of benign (BGSM) and malignant tissue (PCSM) present in skeletal muscle at the inked surgical margin. We performed multivariate analysis to identify factors predictive of these findings.

Results: Of 934 specimens reviewed, 93% (867/934) had skeletal muscle present at the apical margin. The prevalence of cancer in skeletal muscle at inked margins was 16%. The number of cases with positive margins (PSM) at other locations was 50 (5.8%). The number of cases with BGSM alone was 220 (25.3%). PCSM alone was noted in 10% (87/867) while 55 (6.3%) had both benign and malignant tissue in skeletal muscle. The PCSM positive cohort had higher rates of pathologic T2c and T3a disease and mean percentage of positive biopsy cores (p<0.05 for all). Age (greater) and PSA at diagnosis were associated with PCSM (p<0.001 for both); PSM and pathologic Gleason grade (p<0.05 for both of the latter). PCSM was not associated with an increased risk of BCR when controlling for age and PSA at diagnosis, pathologic Gleason grade and T stage (p >0.05). CAPRA score (HR 1.5), pathologic T4 disease (HR 10.7) and age at diagnosis (HR 1.1) were predictive of BCR (p<0.05 for all) (Table 4).

Conclusion: Skeletal muscle at the apical margin contains benign glands and cancer in 32% and 16% of cases, respectively. The robotic approach and positive margins noted elsewhere are independent predictors of finding tumor within skeletal muscle at the apical margin.

Source of Funding: None
Introduction: Prostate specific antigen (PSA) based prostate cancer screening has dramatically decreased over the last 8 years in the United States. This is due to multiple factors including publication of negative results in 2009 from the Prostate, Lung, Colorectal and Ovarian Cancer (PLCO) Screening Trial and the United States Preventative Services Task Force (USPSTF) 2008 and then 2012 recommendations against routine screening. Intense studies on the effects of these changes are underway. Data from the National Health Interview Survey show declines in PSA screening among all men after 2010 however the magnitude of these declines varied by age groups. Men aged 60-74 years, for example, who were most heavily screened in 2005, demonstrated the greatest decline to 43.6% of the group by 2013. A separate analysis suggested that changes in screening rates also varied by race where Caucasian men showed the sharpest decline in screening after 2010 with no change noted for African American or Asian men. Given these findings, we sought to compare changes in newly diagnosed metastatic prostate cancer incidence and specifically, to assess the impact of these changes by race and age.

Methods: We analyzed new prostate cancer incidence by stage at diagnosis between 1988-2013 within the California Cancer Registry. We further stratified cases by four major race/ethnicity groups (non-Hispanic white (NHW), non-Hispanic black (NHB), Hispanic and non-Hispanic Asian/PI (API)) and age less than 65, 65-74, and 75 or over. We used SEER summary stage, categorized as localized, regional, and distant, that allowed us to compare incidence by stage over the entire time period. Incidence rates were calculated per 100,000 and age-adjusted to the 2000 US Standard Population. Joinpoint regression, a program of the National Cancer Institute’s SEER program that detects changes in trends, was used to detect changes in incidence and to calculate the average percent change (APC) during the most recent time period for each age and race/ethnicity group. All data were analyzed using SEER*Stat version 8.1.15 and Joinpoint Regression Program version 4.1.0 and a p-value of < 0.05 was considered statistically significant.

Results: The incidence of localized prostate cancer declined for all race/ethnicity groups in California over the most recent time period (Figure 1) and also declined in all age groups. After remaining relatively flat since 1992, incidence of localized prostate cancer among NHW men declined by over 8% per year starting in 2007 compared with a more gradual decline of -3.52% a year since 2000 for NHB, and more recent declines of -14.41% and -16.64% for Hispanic and API men, respectively (Figure 2). Incidence of regional stage cancer also declined in all groups, but less dramatically (results not shown). In contrast, rates of remote prostate cancer incidence for white men increased in the most recent decade (+0.28%) after steady declines in previous years. Incidence of remote prostate cancer continued to decline for NHB (-2.73%), Hispanic (-2.04%), and API (-1.45%) men. An increase of +1.1% a year since 2002 was noted for NHW men under age 65 (figure 2).

Discussion: Incidence rates of newly metastatic prostate cancer may be starting to rise, primarily for younger and Caucasian men. These changes are in stark contrast to significant declines in previous decades and ongoing rate declines for other races studied. Although not possible to determine causes for these findings, white men were the most heavily screened prior to 2008 and recorded the earliest decline in PSA screening and localized disease incidence. These provocative trends are congruous with and predicted by modeling the effects of decreasing PSA screening and should prompt new discussions regarding the risks and benefits to PSA screening.

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Introduction and Objectives: Neoadjuvant therapy has become the state of the art methodology for tumor size reduction (down-sizing) and possible alteration from one stage of disease to another (down-staging). Prostate Cancer treatment has been enhanced by the timeliness and efficacy of neoadjuvant therapy. Regardless of the methodology used, the PSA (prostate specific antigen) has served as the biologic marker to gauge effectiveness of treatment response. Thus, PSA is a surrogate marker to disease suppression or inactivity in the vast majority of cases. The concept of CAB (combined androgen blockade) is well known. This format remains the gold standard for patients with clinical stage C or stage D disease. The goal of such therapy is to provide stabilization of disease, maintain minimal side effects, provide minimal impact on quality of life issues while allowing patient compliance in a cost effective manner. Based upon the belief that an antiandrogen (examples: Flutamide, Casodex, Nilandron) + Finasteride (Proscar) could reduce disease activity as effectively as standard CAB, a study model was designed to compare the two arms prospectively. In a randomized format, an LHRH-analog (examples: Lupron, Zoladex) + Flutamide arm was compared to a Flutamide + Finasteride arm. PSA nadir was the pre-selected end point to disease stabilization prior to definitive therapy. It is generally accepted that physicians recognize a low PSA as a marker representative of decreased cancer activity.

Methods: Seventy-six patients with organ confined prostate cancer were randomized to the LHRH-a + Flutamide arm or the Flutamide + Finasteride arm. Organ confinement was largely left to physician judgment and in concert with recognized diagnostic modalities. The initial PSA at disease verification was recorded prior to the initialization of the neoadjuvant treatment arm. Subsequent PSA testing was recorded weekly starting at week 4. PSA testing continued until the PSA nadired at less than 2.0 ng/ml. At this point, patients were scheduled to undergo definitive treatments including radical prostatectomy, brachytherapy, external beam therapy, combination radiation therapy, or cryosurgery.

Results: Seventy-six patients representing 6 institutions qualified for the study. Patient selection was based upon standard randomization technique while organ confined prostate cancer was determined and validated using recognized industry standards. Twenty-nine patients were evaluated on an LHRH-a + Flutamide arm while thirty-five patients entered the Flutamide + Finasteride arm. Patient selection for this study was based on the likelihood that definitive therapy would be carried out. Defined treatment included radical prostatectomy, external beam radiation therapy, brachytherapy, and cryosurgery. The average PSA starting point for the Flutamide/Finasteride arm was 10.95 ng/ml (N=35), while the average PSA starting point in the LHRH-a/Flutamide arm was 9.3 ng/ml. The average PSA nadir was 0.59 ng/ml in the Flutamide/Finasteride arm while the average PSA nadir in the LHRH-a/Flutamide arm was 0.45 ng/ml. The average change in PSA in the Flutamide/Finasteride arm was 10.36 ng/ml while the average change in PSA in the LHRH-a/Flutamide arm was 8.85 ng/ml. The average days to nadir on the Flutamide/Finasteride arm were 60.06 while the average days to nadir with the LHRH-a/Flutamide arm were 59.83. Twelve patients failed to complete the neoadjuvant trial. Reasons given for study withdrawal included: urinary retention, a positive bone scan, nausea and diarrhea, heart palpitations, hot flashes, history of previous prostate cancer treatment, history of triple hormone blockade, excessive medicine expense, and inability to nadir the PSA or patient non-compliance.

Conclusion: While no one has criticized the ability of CAB to nadir cancer activity, validated through the use of PSA, the use of an antiandrogen + Finasteride is a novel if not, a new approach in the battle for prostate cancer suppression. While the economic ramifications of this study are significant, both the physician and patient are given an opportunity to nadir disease activity with a very user friendly and cost effective methodology, heretofore, not identified. Additionally, it would appear that the side effect profile would favor the novel Flutamide/Finasteride approach.
ROLE OF THE 17-GENE GENOMIC PROSTATE SCORE™ (GPS) ASSAY IN TREATMENT DECISIONS IN MEN WITH NEWLY DIAGNOSED CLINICALLY LOW RISK PROSTATE CANCER (PCA): EARLY EXPERIENCE FROM A LARGE PROSPECTIVE STUDY IN COMMUNITY UROLOGY PRACTICES

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Presentation to be made by Dr. Bela Denes

Introduction and Objectives: The Oncotype DX® GPS Assay is a validated, biopsy-based gene expression assay that provides an individualized estimation of the likelihood of favorable pathology at the time of surgery. Herein we report patient and physician perceived value of the GPS and its impact on patients’ decisional conflict in men with newly diagnosed clinically low risk PCa.

Methods: PCa patients with NCCN® very low (VL), low (L), or intermediate (Int) risk received GPS in a prospective observational study. The first 298 study patients with evaluable GPS were included in this analysis. Urologists reported on perceived utility of the test and changes in confidence in treatment plan following discussion of the test results. Patients reported perceived utility of the test and completed the Decisional Conflict Scale (DCS, 0-100) before and after receiving the results. Low decisional conflict was defined as DCS <25.

Results: Patients were enrolled from 22 community sites in US with 26% NCCN VL, 44% L and 30% Int. Physicians found the GPS useful in 91% of cases; in 93% of cases GPS increased confidence in treatment recommendations. 96% of patients found GPS useful in decision makings. Lower DCS was observed after GPS across all NCCN risk groups (pre- and post-GPS 29 and 16, respectively). Low DCS was reported by 60% of men after GPS compared to 36% before GPS.

Conclusions: For newly diagnosed patients with clinically low risk PCa, the GPS assay may play a useful role in improving physician confidence in treatment recommendations and reducing decision conflict for patients.

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DETECTION OF HIGH-GRADE PROSTATE CANCER USING A URINARY MOLECULAR BIOMARKER-BASED RISK SCORE

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Objectives: Prostate cancer (PCa) screening and diagnosis would benefit significantly from more accurate, non-invasive techniques. Multimodal approaches incorporating different information sources synergistically will improve patient management and enable a more objective risk assessment. In this study a 2-gene mRNA biomarker assay (HOXC6 and DLX1) for the detection of high-grade (Gleason score (GS) ≥7) PCa was validated. These expression levels were combined with traditional PCa risk factors into a risk score expressing an individual patient’s risk for harboring high-grade PCa.

Methods: Urine samples from 905 men from two independent cohorts were collected after digital rectal examination (DRE) and prior to biopsy. The first cohort of 519 samples was used as training set for the selection of the optimal mRNA qPCR assay and the development of the multimodal high-grade PCa risk score, which was subsequently validated in a second cohort of 386 samples. Logistic regression models were built to model patient risk, of which the performance was evaluated with the area under the curve (AUC) of the receiver operating characteristic (ROC).

Results Obtained: The mRNA assay could be readily assessed in whole urine samples and proved to be a good predictor for the detection of high-grade PCa with an AUC of 0.73 (95% confidence interval (CI): 0.67-0.78) in the validation cohort. The multimodal approach reached an AUC of 0.90 (95% CI: 0.87-0.93) for men with high-grade PCa. The model included the mRNA assay, PSA density, DRE and previous prostate biopsies as strongest, most significant components, in addition to PSA, age and family history of PCa. With an AUC of 0.86 (95% CI: 0.80-0.92), no significant difference was observed in the validation cohort (p=0.3). Due to inter-observer variability in DRE, a model without this risk factor was generated, resulting in an AUC of 0.87 (95% CI: 0.80-0.92) in the training cohort and 0.90 (95% CI:0.85-0.95) in the validation cohort (p=0.4 for difference in AUC). The mRNA-based approach was significantly better in identifying high-grade PCa patients compared to PCA3 (AUC: 0.68; p<0.001), the prostate cancer prevention trial risk calculator version 2 (PCPTRC; AUC: 0.77; p<0.001) or a combination of PCA3 with PCPTRC (AUC: 0.80, p<0.007). At a negative predictive value for GS≥7 of 98%, 52% of the unnecessary biopsies could be avoided.

Conclusion: The risk score based on the 2-gene mRNA urine assay combined with traditional clinical risk factors resulted in a significantly better patient risk stratification compared to current methods in clinical practice.
ALLOGENEIC BLOOD TRANSFUSION IS ASSOCIATED WITH INCREASED MORTALITY AND INFECTIONOUS COMPLICATIONS AFTER OPEN RADICAL PROSTATECTOMY

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(Presentation to be made by Dr. Lam)

Purpose: Allogeneic blood transfusions (ABT) are thought to play a role in the host cellular immune response, an immunosuppressive effect known as transfusion-related immunomodulation (TRIM). This has most commonly been studied in other malignancies, including colorectal and hepatobiliary cancers. Prior studies examining transfusion in radical prostatectomy have demonstrated decreased overall survival in those receiving ABT’s. Here we examined whether ABTs increase perioperative morbidity and mortality in multi-institutional national database, in addition to performing subgroup analysis of surgical and infectious complications after open radical prostatectomy.

Methods: We used the National Surgical Quality Improvement Program (NSQIP, 2010 to 2013) to study the use of ABT during hospitalization for radical prostatectomy, identifying the rates of postoperative mortality and complications (cardiovascular, pulmonary, thrombotic, wound, neurologic, and infectious). Subgroup analysis of infectious complications assessed surgical site infection, pneumonia, abscess, urinary tract infection, and sepsis. We examined the association between ABT and mortality, all postoperative complications, and infectious 00834044 ones after controlling for potential confounders (co-morbidity predictor, age, race, diabetes, and operative time).

Results: We identified 4,947 open RPs performed during the study period that included the variables of interest. The rate of ABT was 13.71%. Patients who received an ABT had an increased risk of mortality (0.9% vs 0.1%, \( p < 0.001 \)), overall complications (13.6% vs 5.5%, \( p < 0.01 \)), and infectious complications (7.7% vs 3.2%, \( p < 0.001 \)). After adjusting for potential confounders, ABT remained an independent predictor for all complications, infectious complications, and mortality (\( p < 0.001 \)).

Conclusions: ABT is independently associated with an increased risk of perioperative complications, particularly infectious ones. This study validates prior work demonstrating worse overall mortality among prostatectomy patients receiving ABT’s, and goes further in elucidating infectious etiologies as a strong driver of these outcomes.
**Introduction:** A wide local excision (WE) approach to radical prostatectomy (RP) has been shown to result in lower positive surgical margins rates when compared to a nerve sparing (NS) approach. Whether this improved local control translates to improved progression free survival (PFS) and overall survival remains a subject of debate, with conflicting findings reported in the literature. To our knowledge, only one study has examined long term oncologic outcomes in patients undergoing NS and WE-RP, finding no significant differences in PFS at 5 years. We present a retrospective comparison of patients undergoing WE and NS RP with mean follow up duration of 10 years, toward the goal of improved surgical management of prostate cancer patients.

**Methods:** Our study included only patients who underwent WE and NS radical prostatectomy performed by two surgeons at a single institution in Salt Lake City, UT from June 1989 to December 1995. Only patients with at least 60-month follow-up were included and censored at time of PSA recurrence (PSA ≥0.02), or death. Patients with seminal vesicle or nodal involvement and pre-operative hormonal or radiation treatment were excluded. Data regarding procedure type, PSA, age, Gleason sum, clinical and pathologic stages, follow-up interval, margin status, and PSA progression were recorded. The two groups were compared to determine differences in surgical margins as well as five and ten year PSA recurrence and survival rates.

**Results:** A total of 130 patients met our inclusion criteria, including 70 patients (54%) who underwent WE-RP and 60 (46%) who underwent NS-RP. Mean age and preoperative PSA were 64 (SD± 7.3, range 40-78) and 10 (SD± 9.6, range .9-71), respectively. Overall Gleason sum was distributed as follows: 3 (2%), 4 (5%), 5 (34%), 6 (27%), 7 (27%), 8 (2%), and 9 (2%), while tumor pathologic stage was pT2a (32%), pT2b (36%), and pT3a (33%). Mean follow up duration and time to PSA recurrence (if applicable) was 120 months (SD± 55, range 61-292), and 49 months (SD± 40, range 2-143), respectively. Forty-three patients from our cohort had complete 10 year PSA and survival data available, including 26 (60%) patients who had undergone WE-RP and 17 (40%) who underwent NS-RP.

**Comparative Statistics.** The two series were not significantly different when compared for age, PSA, Gleason sum, clinical and pathologic stage, or time to PSA recurrence. Positive surgical margins were significantly lower in the WE group (mean 20% vs 35%, p = .05). No significant difference was observed in five year PSA recurrence rates (p = .19) and overall survival (p = .55). However, PSA recurrence rates were significantly lower for the WE group (35% vs 65%, p = .05) at 10 years, although overall survival rates were not significantly different between groups (p=.21).

**Conclusions:** Our results show that WE-RP may offer improved PFS in prostate cancer patients, but without concordant improvement in survival rates. It should be noted that unlike most previous studies, disease burden was comparable between groups and not heavier in the WE-RP cohort. Further, complete 10 year data was not available for the entire cohort. These findings nonetheless bear interesting implications for prostate cancer management, suggesting that choice of surgical approach may have delayed manifestation in oncologic outcomes.

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LYMPH NODE POSITIVE PROSTATE CANCER AFTER ROBOTIC PROSTATECTOMY AND EXTENDED PELVIC LYMPHADENECTOMY: LARGE SINGLE INSTITUTIONAL EXPERIENCE
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(Presentation to be made by Dr. Jaspreet S. Parihar)

Introduction: Optimal management of men with prostate cancer who are found to have lymph node positive disease after prostatectomy remains a challenge. Commonly employed options include observation, androgen ablation therapy and radiation therapy delivered in adjuvant or salvage settings. We evaluate and present our large institutional experience in treating men with robotic prostatectomy who demonstrated node positive disease on final pathology.

Methods: Using our prospective institutional database consisting of over 6500 patients, we retrospectively identified subjects who underwent robot assisted radical prostatectomy with bilateral extended pelvic lymph node dissection and identified those with node positive prostate cancer on pathologic analysis (pN1). As we instituted extended pelvic lymphadenectomy in 2010, the analysis included patients that had surgery between 2010-15. Clinical N1, M1 as well as salvage prostatectomy cases were excluded. Group 1 consisted of patients who received no additional treatment, Group 2 patients received adjuvant therapies (defined as treatment when PSA <0.2), and Group 3 patients received salvage therapies. Baseline characteristics as well as perioperative surgical parameters were compiled. Multivariate logistic regression was used to identify predictors for receiving any additional treatment vs. none. Time to metastatic radiographic recurrence and overall survival (OS) was determined using the Kaplan-Meier method.

Results: 145 patients met the inclusion criteria and were analyzed. Median followup was 19 months. Among the three groups, no difference was observed in baseline characteristics such as age, race, ethnicity or Charlson Comorbidity Index. Median preoperative PSA was lowest in Group 1 compared to Groups 2 or 3, p=0.04. Incidence of pathologic Gleason 4+4 or higher was 22%, 42%, 57% in Groups 1,2, and 3 respectively. Median number of positive nodes also varied between 3 for patients receiving salvage therapy compared to 1 with the other two groups. Multivariate logistic regression showed that predictors for additional therapy were pathologic Gleason ≥8 (OR=3.7, p=0.002), and number of positive nodes (OR=1.7, p=0.001). Odds of receiving additional therapy increased by 0.7 with each additional positive node. 2-yr metastatic recurrence-free rates for Groups 1, 2 and 3, respectively were (95%CI): 100%, 87% (69-95), 77% (60-88), p=0.01. 2 year OS rates for Group 1, 2 and 3 were (95%CI): 92% (76-98), 100%, 93% (76-98).

Conclusions: In our experience for node positive disease following prostatectomy, patients with higher pathological grade and greater number of positive lymph nodes were more likely to receive therapies in adjuvant or salvage settings. While longer follow-up is needed, most patients did not develop distant metastases. No patients that were observed developed radiographic metastases suggesting that some patients with favorable grade and fewer positive lymph nodes may be safely watched.

Source of Funding: None
COMPARISON OF THREE DIFFERENT AUDITORY ENVIRONMENTS AND THEIR EFFECT UPON TRAINING IN NOVICE ROBOTIC SURGEONS

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(Presentation to be given by Dr. Pierce)

Introduction and objectives: The effect of the auditory environment in the operating room and its impact upon surgeon training and stress levels have not been fully characterized. The purpose of this study is to determine the preferred training environment for novice robotic surgeons and the effect of this environment upon the surgeon’s stress and performance.

Methods: 53 medical students were randomized to a background auditory environment with either no music, classical music, or death metal music. Students performed 2 tasks (Energy Dissection and Suture Sponge) using the da Vinci Surgical Skills Simulator. Three trials were performed in each of the three auditory environments and performance scores were reported. Stress level was assessed by recording change in mean arterial pressure from students’ baseline. Following the trial, subjects completed a questionnaire about their preferences regarding the different auditory environments. Data were analyzed using the Chi-square test for categorical variables and the Kruskal-Wallis test for continuous variables.

Results: During the Energy Dissection task, a significant proportion of students in the classical music group experienced a decrease in mean arterial pressure (57%) compared to the no music and the death metal music groups (0%) and (11%) respectively (p<0.05 for both). During the Suture Sponge task, 71% of students in the classical music group experienced a decrease in mean arterial pressure compared to 29% of students in the no music group and 11% of students in the death metal music group (p<0.05 for both). Students reported that no music and classical music environments were more relaxing, more pleasant, and better at boosting their performances compared to the death metal group (p<0.01 for all). However, there was no significant difference in students’ preference between the classical music and no music environments (p>0.05). There were no significant differences between the simulator scores for either task among the three groups.

Conclusions: Listening to classical music during surgical training of novice robotic surgeons was associated with a reduction in stress level as evidenced by a lowering of blood pressure. Although there was no difference in the performance scores between the three groups, novice robotic surgeons felt more confident and calm in either the silent or classical music environment.

Sources of Funding: None
DECIPHER TEST IMPACTS ADJUVANT TREATMENT DECISION-MAKING AMONG PATIENTS WITH HIGH-RISK PATHOLOGY AT RADICAL PROSTATECTOMY: RESULTS FROM THE MULTICENTER PROSPECTIVE PRO-IMPACT STUDY

(Presentation to be made by Dr. John L. Gore)

Introduction and Objective: The decision to provide adjuvant therapy to men with high risk pathology after radical prostatectomy (RP) is confounded by tremendous uncertainty. We prospectively evaluated the impact of the Decipher® test (GenomeDx Biosciences Inc., Vancouver), which predicts metastases after RP, on patient and provider decision quality.

Subjects and Methods: 150 adjuvant patients were enrolled by 43 urologists from 19 community and academic practices. Patients with pathologic T3 stage classification (pT3) or positive surgical margins (SM+) after RP were included. Participating physicians provided a management recommendation before and after exposure to Decipher test results. Patients completed validated surveys on health-related quality of life, decisional conflict, and prostate cancer-related anxiety.

Results: Median patient age at RP was 64 years; 67% and 50% had pT3 and SM+ pathology, respectively. Decipher classified 46%, 22% and 32% of men as low-, intermediate- and high-risk, respectively. Pre-Decipher, observation was recommended for 89%. Post-Decipher, 18% (95% CI 12-25%) of treatment recommendations changed, including 9% of low-risk and 31% of high-risk Decipher patients. Patients’ Decisional Conflict Scale (DCS) scores decreased (indicating higher decision quality) after exposure to Decipher results (median DCS pre-Decipher 25 [IQR 8-44], median DCS post-Decipher 19 [IQR 2-30], p<0.001), with greatest decreases in the subdomains of decision uncertainty and decision support. Patients with low-risk Decipher results experienced a trend toward decreased general prostate cancer-specific anxiety (p=0.13) and a significant reduction in fear of prostate cancer recurrence (p=0.02). Physicians’ median DCS scores decreased from 32 [IQR 28-36] to 28 [IQR 12-42] (p<0.001). Decipher results were associated with the decision to pursue ART in multivariable logistic regression (OR 1.48; 95% CI 1.19-1.85, p<0.001).

Conclusions: Observation is the predominantly prescribed management strategy for patients with high risk features at RP. Knowledge of Decipher results was associated with treatment decision-making among these patients: patients at low risk for metastasis had higher rates of observation recommendations and patients at high risk had higher rates of ART recommendations. Decision quality was improved and prostate cancer-specific anxiety was decreased for patients exposed to Decipher results.

Source of Funding: GenomeDx Biosciences Inc.
UTILITY OF ANTERIOR ZONE BIOPSY IN MEN ENROLLED IN ACTIVE SURVEILLANCE FOR PROSTATE CANCER

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Objectives: One fifth of men with newly diagnosed prostate cancer (PC) have anterior dominant disease. Anterior zone (AZ) disease is associated with poor pathologic features. The purpose of this paper was to assess the utility of AZ sampling during prostate needle biopsy in patients undergoing active surveillance (AS) for low-risk prostate cancer.

Methods: Men who were enrolled in our AS program 2006 - 2014 were identified. Disease characteristics were collected, including number of positive cores and Gleason score on all diagnostic and surveillance biopsies. Progression was defined as incident Gleason > 6 in any core (previously negative or Gleason 6) and/or receipt of definitive therapy including radical prostatectomy or radiation therapy.

Results: 85 men were included. Progression occurred in 45% men. 78% of men with AZ/peripheral zone progressed, while 47% of men with AZ-only disease progressed. On univariate analysis, body mass index (BMI) and presence of ≥ 2 positive cores correlated with progression. The presence of AZ disease was associated with progression, but this was only by statistical trend. Only BMI correlated with progression on both univariate and multivariate analysis.

Conclusions: One third of men enrolled in AS for low risk PC had AZ disease on diagnostic biopsy. Progression occurred in the majority of these men. AZ sampling should be considered in biopsy surveillance strategies in men who choose AS for primary management strategy.

Source of Funding: None
TRANSPERINEAL PROSTATE MAPPING BIOPSY CORRECTLY IDENTIFIES CANDIDATES FOR RADICAL PROSTATECTOMY

(Presentation to be made by Dr. John Hoenemeyer)

Introduction and Objectives: Intra-prostatic staging by transperineal mapping biopsy (TPMB) may improve identification of men with prostate cancer best suited for radical prostatectomy (RP). We investigated the results of TRUS biopsy positive men with minimal disease, biopsy negative and biopsy naive men who had TPMB followed by RP.

Methods: 366 men being considered for focal therapy or active surveillance had TPMB of which 45/218 with prostate cancer (20.6%) had RP. 12 (26.7%) had a prior positive TRUS biopsy with minimal disease, 24 had negative biopsy (median 1.5) and 9 were biopsy naive. TPMB was performed through a template with biopsies taken at 5 mm intervals. Multiple in-line samples were taken if prostate length exceeded 2 cm. A proprietary software program was used to track biopsy locations. Men with prior TRUS had a median of 12 cores sampled while the 45 with TPMB had 50 cores. Associations between positive TRUS and TPMB were compared in men undergoing RP by ANOVA and chi-square analysis. The surgical pathology specimen was also compared to the results of TPMB.

Results: Median Age, PSA and PSAD were 63 years, 6.3 mg/ml and 0.164. Of the 12 men with prior positive biopsy 6 had Gleason score (GS) 6 and 6 GS 7. TPMB in these 12 revealed GS 6 in 3 (25%), 7 in 7 (58.3%) and 8-10 in 2 (16.7%). The median number of positive cores was 12 and 14 (58.3%) had bilateral disease. RP specimens revealed GS 6 in 2, GS 7 in 7 with 3 pending. After RP, 8 had pT2c and 1 pT3. No patients were downgraded to low volume GS 6. 33 had negative TRUS biopsy or were biopsy naive and had TPMP then RP. Mapping pathology was GS 6 in 11 (33%), 7 in 17 (51.5%) and 8-10 in 5 (15.5%). 22 (66.7%) had bilateral disease. Surgical specimen data was available in 25 with GS 6 in 5 (20%), 7 in 16 (64%) and 8-10 in 4 (16%). RP stage was pT2a/b in 4 (16%), pT2c in 13 (52%) and pT3 in 8 (32%). The 2 patients with low volume disease on RP each had 1 core GS 6 with TPMB.

Conclusions: Intra-prostatic staging by TPMB can correctly identify appropriate candidates for RP. 43/45 (95.6%) had high volume or grade on surgical pathology which was determined by TPMB. The 2 RP patients who could have been managed by AS were also identified by mapping biopsy.

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MOLECULAR IMAGING USING 68GA-PSMA PET MAY INCREASE DETECTION OF REGIONAL AND DISTANT METASTASIS IN CLINICALLY HIGH RISK PROSTATE CANCER PATIENTS AND IN PATIENTS WITH BIOCHEMICAL RECURRENCE


Background: Prostate-specific membrane antigen (PSMA) overexpression in prostate cancer (PCa) makes it an excellent option as ligand in molecular imaging for the detection of recurrent and/or metastatic disease. One radiopharmaceutical that has gained popularity is gallium 68 (\(^{68}\)Ga)–PSMA, which may increase accuracy of PCa staging prior to or after definitive treatment and could enable a tailored treatment approach in patients with high-risk disease.

Objective: To describe the detection of nodal and distant metastasis in patients with high-risk PCa prior to definitive treatment and in the setting of biochemical recurrence after treatment using \(^{68}\)Ga-PSMA positron emission tomography (PET) imaging associated with magnetic resonance imaging (MRI) or computed tomography (CT).

Methods: 91 patients underwent \(^{68}\)Ga-PSMA PET imaging in 2015 and 2016. 30 men had high-risk PCa, defined as CAPRA-S ≥5, GS ≥8, PSA ≥20, or cT3a) and 61 patients had biochemical recurrence after prostatectomy or radiation therapy with PSA doubling time ≤ 12 months. Rates of detection of local, regional or distant disease were calculated. A comparison between results of \(^{68}\)Ga-PSMA PET imaging and surgical pathology was done in 15 patients who had surgery.

Results: \(^{68}\)Ga-PSMA PET imaging detected nodal metastasis in 40% (n=12/30) and bone metastasis in 7% (n=2/30) of patients with high-risk PCa prior to primary treatment. 42% (n=5/12) of the cases with nodal metastasis had positive nodes located outside the primary landing zone (perirectal, pre-sacral and anterior prostate). Among the 15 patients who elected surgery for their primary treatment, pN staging (nodal staging) and pT staging (tumor staging) were concordant with \(^{68}\)Ga-PSMA PET imaging in 80% (n=12/15) and 44% (n=6/15) of the patients, respectively. Among 61 patients with biochemical recurrence, \(^{68}\)Ga-PSMA PET detected recurrence in 77% (n=47/61; n=13 local, 16 regional, 18 distant) of the cohort. In patients with loco-regional recurrence, 50% of patients had nodal disease outside the primary landing zone (n=14/29). The median PSA at the time of scan for patient without recurrence was 0.7, while the median PSA for visible recurrence on PSMA PET was 1.8.

Conclusion: Our initial experience with \(^{68}\)Ga-PSMA PET imaging suggests it has a high specificity for the detection of nodal metastasis in high-risk patients and after biochemical recurrence. It may improve staging by detecting recurrence outside the primary landing zone, especially in the setting of low PSA. Integration of \(^{68}\)Ga-PSMA PET imaging into risk assessment may improve surgical and radiotherapy treatment planning.

*equal contribution
DOES PI-RADS V2 SCORES PREDICT ADVERSE SURGICAL PATHOLOGY AT RADICAL PROSTATECTOMY?

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Background: In recent years, multi-parametric MRI (mpMRI) has gained increased acceptance and utilization as a diagnostic and staging tool for early-stage prostate cancer. Reporting systems, in particular the Prostate Imaging - Reporting and Data System (PI-RADS), now in its second version, has been advanced as means to standardize the grading and reporting of MRI findings. However, it remains to be determined whether PI-RADS scores independently predict the risk of adverse pathology, i.e. high-grade and/or high-stage disease.

Objective: To evaluate the association of surgical pathological findings assessed on whole-mount pathology analysis and pre-operative mpMRI suspicion assessed using PI-RADS v2 scores.

Methods: We retrospectively analyzed 121 patients who had radical prostatectomy within 12 months of their staging endorectal 3T mpMRI. We examined the association of the PI-RADS v2 scores with adverse surgical pathology, defined as advanced pathologic stage (≥ pT3a) or high-grade disease (primary Gleason pattern ≥ 4) or both, using frequency tables (diagnostic accuracy and chi-square) and logistic regression models.

Results: Of 121 patients, 73 (60%) had adverse surgical pathology; 9 men (7%) had high-grade, 64 (29%) had ≥ pT3 disease, and 29 (24%) had both high-grade and high-stage disease. 106 (88%) had PI-RADS mpMRI score 4 or 5 findings, of whom, 65% had adverse pathology compared to 15 (12%) patients with PI-RADS ≤3, of whom 27% had adverse pathology. Conversely, 95% (69/73) of patients with adverse pathology had positive MR studies (PI-RADS score 4 or 5). Accordingly, mpMRI PI-RADS 4 or 5 demonstrated 95% sensitivity (95% CI 87-98), 23% specificity (95% CI 12-37), 65% PPV (95% CI 55-74), 73% NPV (95% CI 45-92), and 66% accuracy (95% CI 57-75) for the detection of adverse surgical pathology. In the multivariable logistic regression analysis, adjusted for PSA density and age, PI-RADS score 4 or 5 (odds ratio (OR) 4.1, 95% CI 1.2-14.2, p=0.027) and clinical CAPRA score (OR 1.4, 95% CI 1.0-1.9, p=0.026) were significantly and independently associated with higher risk of adverse pathology. This study is limited by its retrospective nature.

Conclusion: PI-RADS v2 score 4 or 5 on mpMRI is highly sensitive for the detection and prediction of adverse pathology. PI-RADS v2 may help improve the detection and staging of prostate cancer and allow for tailored intervention.

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THE 4KSCORE TEST REDUCES PROSTATE BIOPSIES IN CLINICAL PRACTICE

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Introduction and Objective: The reduction in cancer specific mortality resulting from routine PSA screening has been accompanied by over-diagnosis and overtreatment of indolent Gleason 6 prostate cancer. The USPSTF recommendation against routine PSA screening has resulted in a decrease in urology referrals for a suspicious PSA and an emerging stage migration towards more advanced disease. The 4Kscore blood test uses four kallikreins levels plus clinical information in an algorithm to calculate the individual’s % risk for aggressive prostate cancer (Gleason score ≥7) on prostate biopsy. This clinical utility study was conducted to assess the influence of the 4Kscore on shared decision-making in men referred to urologists for suspicious PSA and/or DRE.

Methods: Urologists from both a large urology group practice and individual academic/community urologists in the US who obtained the 4Kscore test as part of their assessment of men referred for suspicious PSA and/or DRE were included in the study. Urologists exercised individual judgment on use of 4Kscore Test result and biopsy decision. 587 unique case report forms from 35 urologists that documented biopsy decisions were evaluated. The association between the 4Kscore and the likelihood of recommending biopsy to the patient was assessed. For those patients whose biopsy results were available by the time of the study, the association between the 4Kscore and the biopsy Gleason score was determined. All bivariate associations were evaluated by Fisher’s exact test.

Results: Of the 587 men referred for a suspicious PSA, 552 men (94%) were recommended to undergo a prostate biopsy. After obtaining the 4Kscore Test results, urologists reported that 212 men (36%) were subjected to prostate biopsy which represents a 64% reduction in prostate biopsies. Approximately 50% of men presented with a low risk 4Kscore test (4K <7.5%) and had a 94% reduction in prostate biopsies. Higher 4Kscore is significantly associated with the likelihood of a patient being referred to biopsy (p<0.001). Among the patients whose biopsy results were collected, 44% (44 out of 101) of the patients with high risk 4Kscore (≥ 20%) were diagnosed with high grade prostate cancer compared 7% of the patients with low risk 4Kscore (<7.5%). Higher 4Kscore is associated with greater risk of high grade prostate cancer (p=0.003).

Conclusions: This contemporary, US real world clinical utility study in 587 men demonstrates that using the 4Kscore test as a follow up test for a suspicious PSA results in an actual meaningful overall 64.5% reduction in prostate biopsies and a 94% reduction in men with a low risk 4Kscore test.