

Final Presentation

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Objectives

- Determine predictors of erectile function preservation after SBRT
- Determine the erectile function rates following SBRT
- Determine who is likely to have erectile function

Potential Predictors

Negatively Associated: - Age, Gleason Score, T-stage, PSA, ADT, BMI

Positively Associated: - HRQOL, Erectile Function at Baseline

We expect HRQOL and Erectile Function at Baseline to be highly correlated, because erectile function is included in the questionnaire.

How many people lose function?

- At baseline: 158 with function, 167 without (0.49)
- At two years: 102 with function, 223 without (0.31)
- A seemingly large number of people lose function in just two years

never_functional	gain_function	loss_function	retain_function
153	14	70	88

Data processing

- Age was centered
- Gleason score was collapsed into “low” (GS ≤ 6), “medium” (GS $= 7$), and “high” (GS ≥ 8)
- T-Stage group was collapsed into two categories, 0 and 1; the lone patient with T-Stage group ≥ 2 went into the 1 group.

Model

- Outcome variable: “Erectile Function at 2 Years”
- Predictors: Age, Gleason Score, PSA, T-Stage Group, ADT, BMI, Erectile Function at Baseline
- Logistic regression using the glm method in R

Results

Logistic regression results

For Erectile function at baseline:

Odds ratios for one unit change (95% CI)

centered_age

0.943** (0.899, 0.988)

Gleason Score

0.904 (0.523, 1.561)

T-Stage Group

0.603 (0.212, 1.715)

PSA

1.063* (0.994, 1.137)

HRQOL

1.023*** (1.007, 1.040)

ADT

0.483 (0.148, 1.581)

BMI

0.979 (0.923, 1.038)

Erectile Function at Baseline

4.299*** (1.824, 10.132)

Observations

325

Note:

$p < 0.1$; $p < \mathbf{0.05}$; $p < 0.01$

Results

- Hosmer-lemeshow test:
- X-squared value of 6.8019
- p-value of 0.5581
- We fail to find any evidence of lack of goodness of fit
- 10-fold CV: raw estimate ~ 0.24
- cost function: mean number incorrect at threshold = 0.5

Results

Error rates

- AUC = 0.842
- Threshold = 0.426 found using Euclidean distance
- 38 percent predicted to have erectile function at two years; from 49 percent at baseline (0.225 error rate)
- Using 0.5 as the cutoff, 30 percent expected to retain (0.206 error rate)
- In dataset, 31 percent of patients had function at two years
- Calculated threshold is more optimistic and encourages treatment

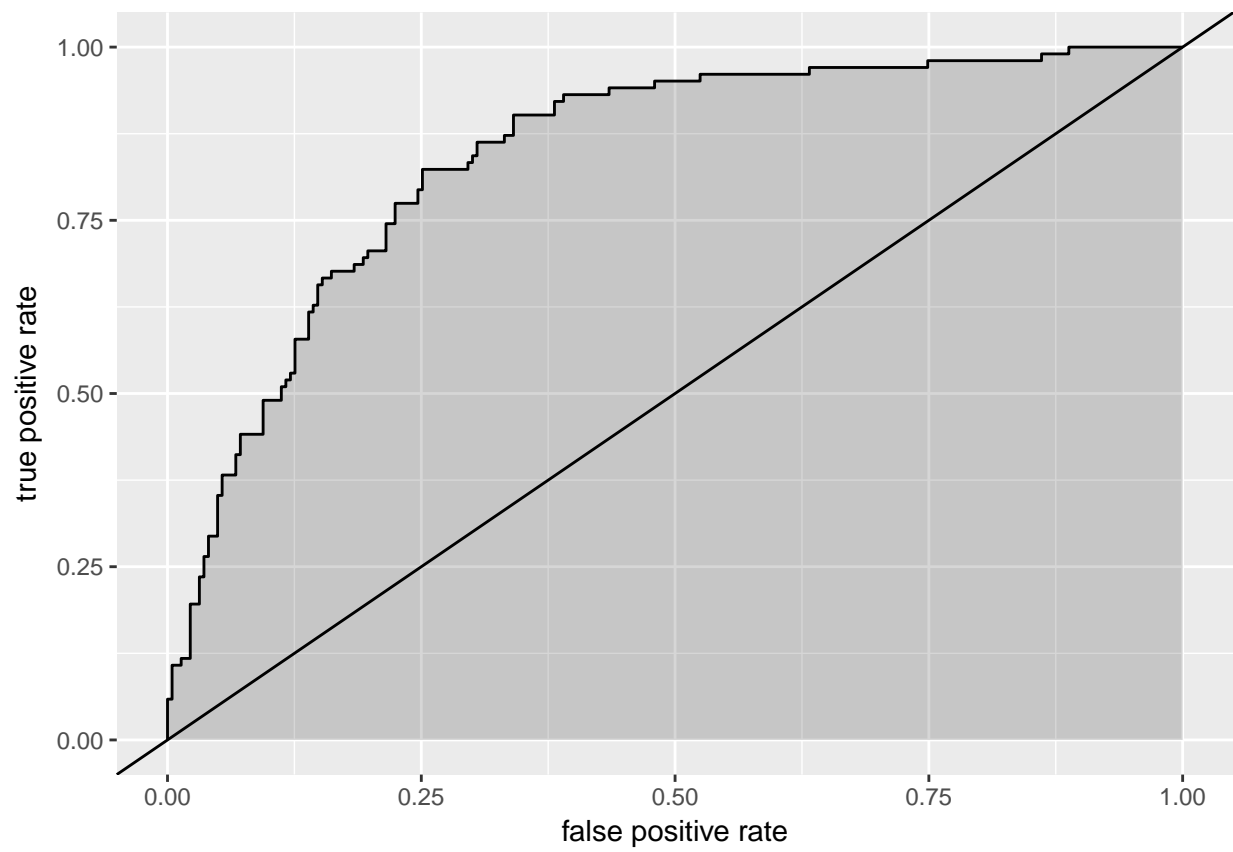


Figure 1: ROC Curve

Conclusions

- Age, HRQOL, and erectile function are predictive of erectile function at two years
- HRQOL and erectile function at baseline are protective, while age is detrimental
- PSA is somewhat protective
- HRQOL and age are the most relevant; PSA levels less so.

Recommendations

- Younger men, with high HRQOL scores and high PSA levels, and have erectile function at baseline will likely retain their erectile function

cen_age	Gleason Score	T_Stage	PSA	HRQOL	ADT	BMI	Erec_base	prob_func	pred_func
-7.14	1	0	32.5	88	0	25	1	0.92	1
7.86	2	1	9.5	25	1	27	1	0.06	0