

BACKGROUND

The incidence of anal cancer is increasing in the United States. It is estimated that there are 7060 patients diagnosed in 2013 (1) with a F:M 1.5: 1 ratio. Its treatment has evolved from a radical surgical treatment, including abdominoperineal resection to a combined chemoradiotherapy (CRT) (Nigro protocol) (2) approach, which allows for sphincter preservation. The specific aim of this study was to develop an accurate model and nomogram to predict overall (OS) and colostomy free survival (CFS) for patients presenting with anal cancer.

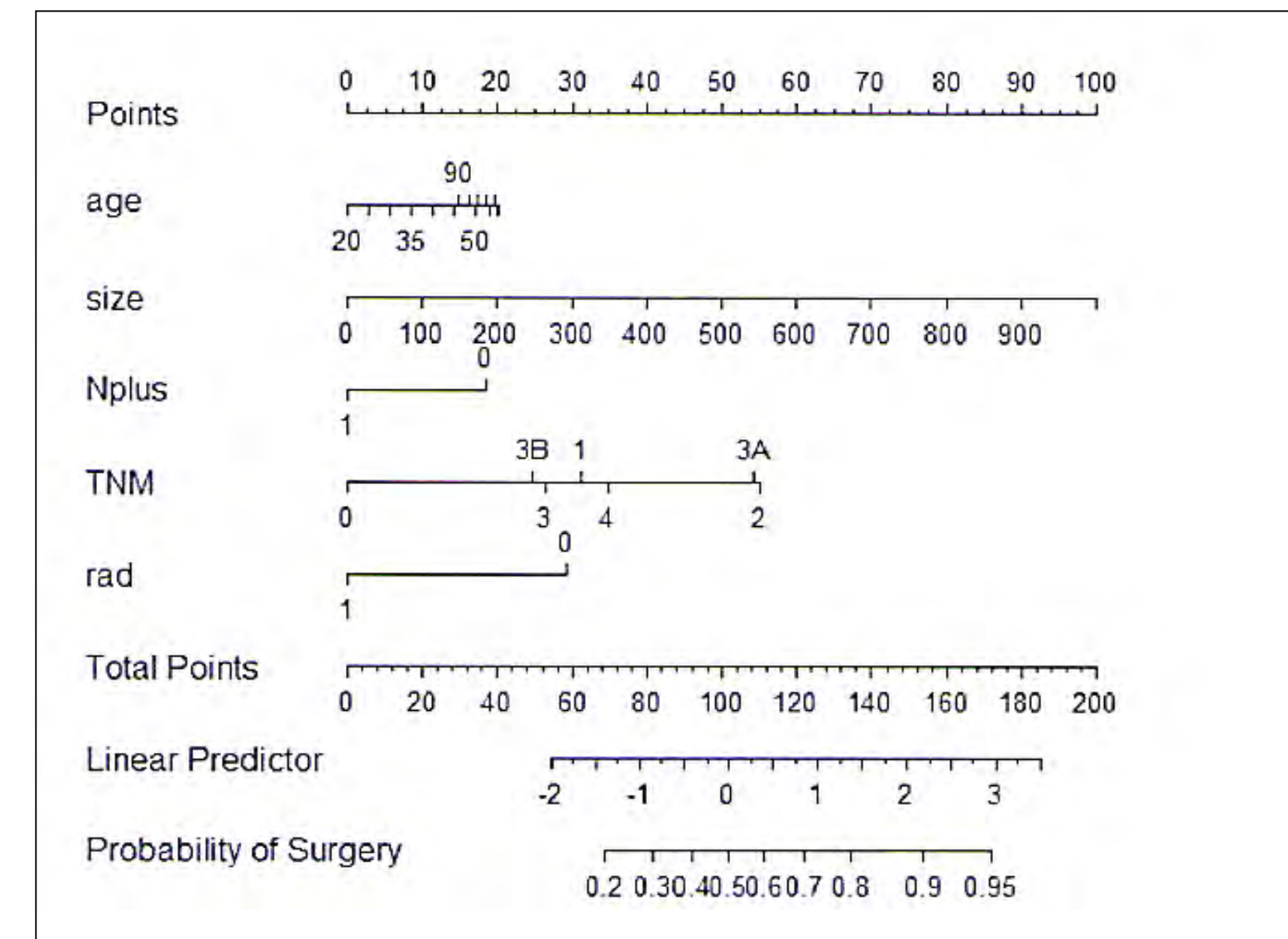
METHODS

Patients with *de-novo* anal cancer were selected from the National Cancer Database (NCDB) from years 1998-2010. The database included 53,523 patients. After excluding patients with missing data points, 1823 patients were included, and their data analyzed. Variables included time to death, censoring indicator, age, race, sex, tumor size, surgery status, nodal status, radiation (RT), and chemotherapy (CT), separately and as a CRT. A stratified Cox proportional hazards model for OS and a logistic regression model for CFS were developed, respectively. For each primary end point, our final model was validated to ascertain whether predicted values from the model are likely to accurately predict responses on future subjects or subjects not used to develop our model.

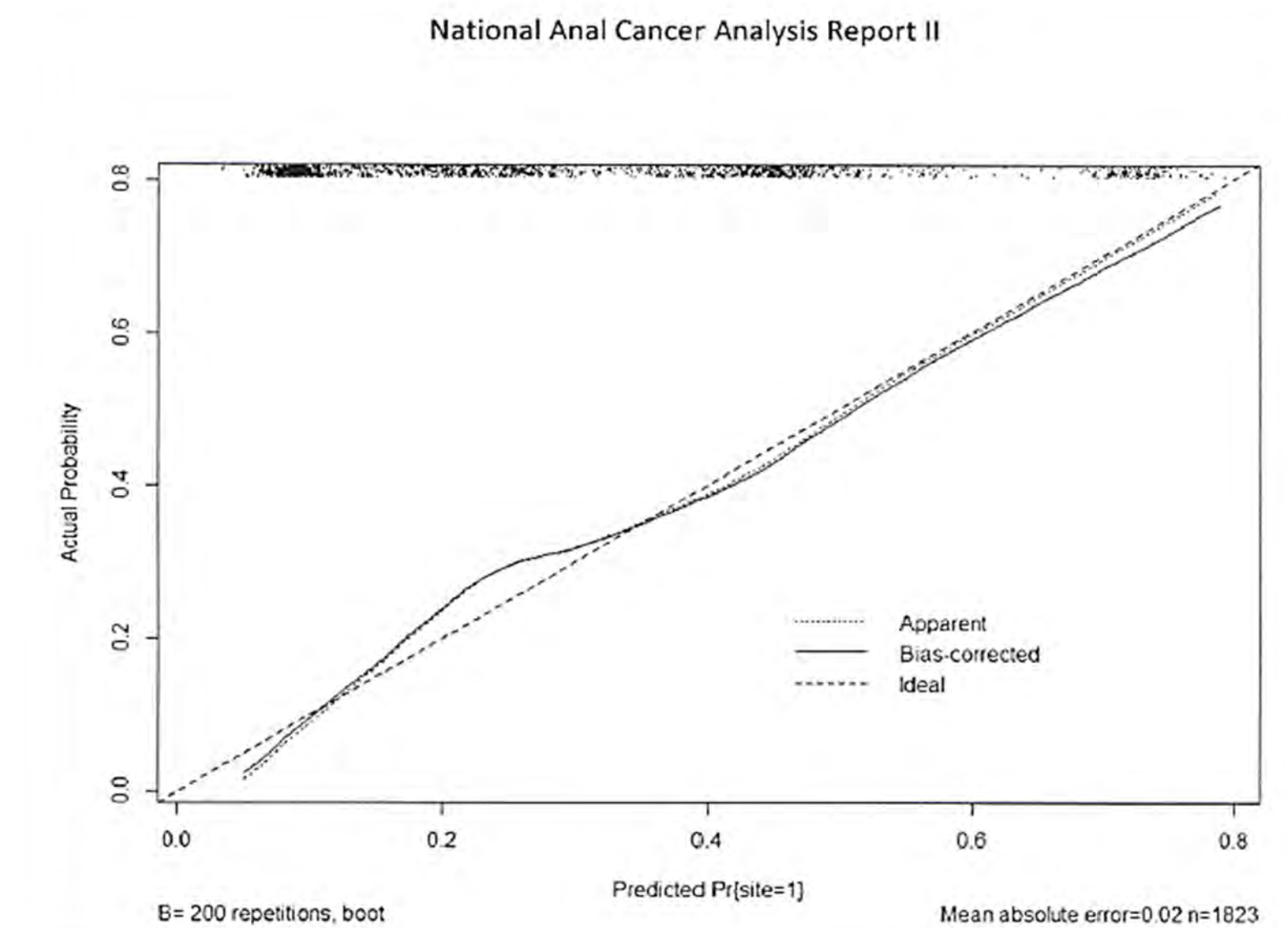
RESULTS

Statistically significant variables in the CFS model were age, nodal status, TNM stage, RT ($p \leq .0001$), and tumor size ($p = .010$). Similarly, for OS model statistically significant variables (all with $p \leq .005$) fitted across the strata of TNM clinical stage included age, sex, tumor size, nodal status, and CRT. Nomograms that predict events are based on our final models with the estimated mean absolute bootstrap calibration error being only .011 for OS model and .02 for CFS model, respectively.

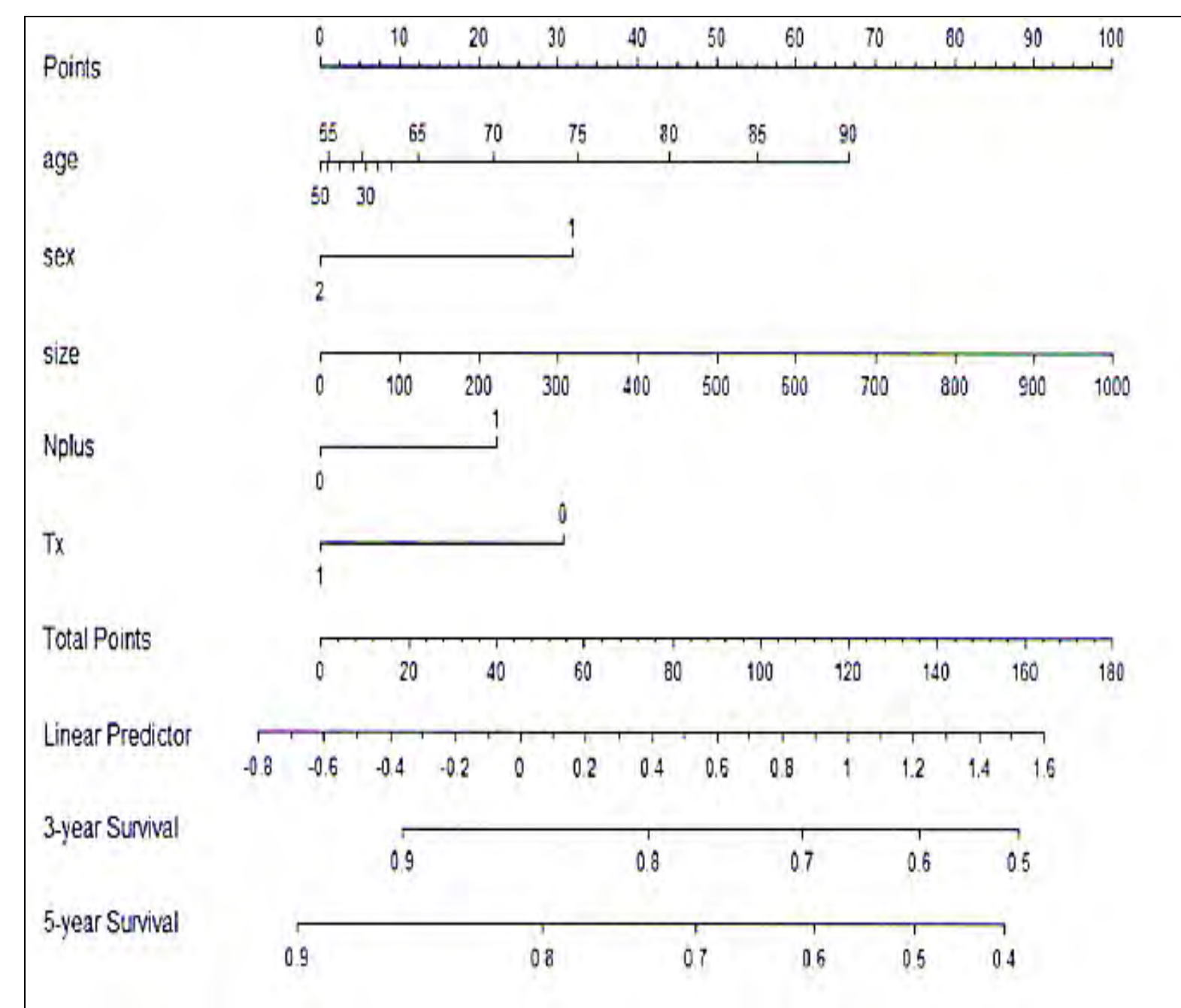
Nomogram of Colostomy-free Survival



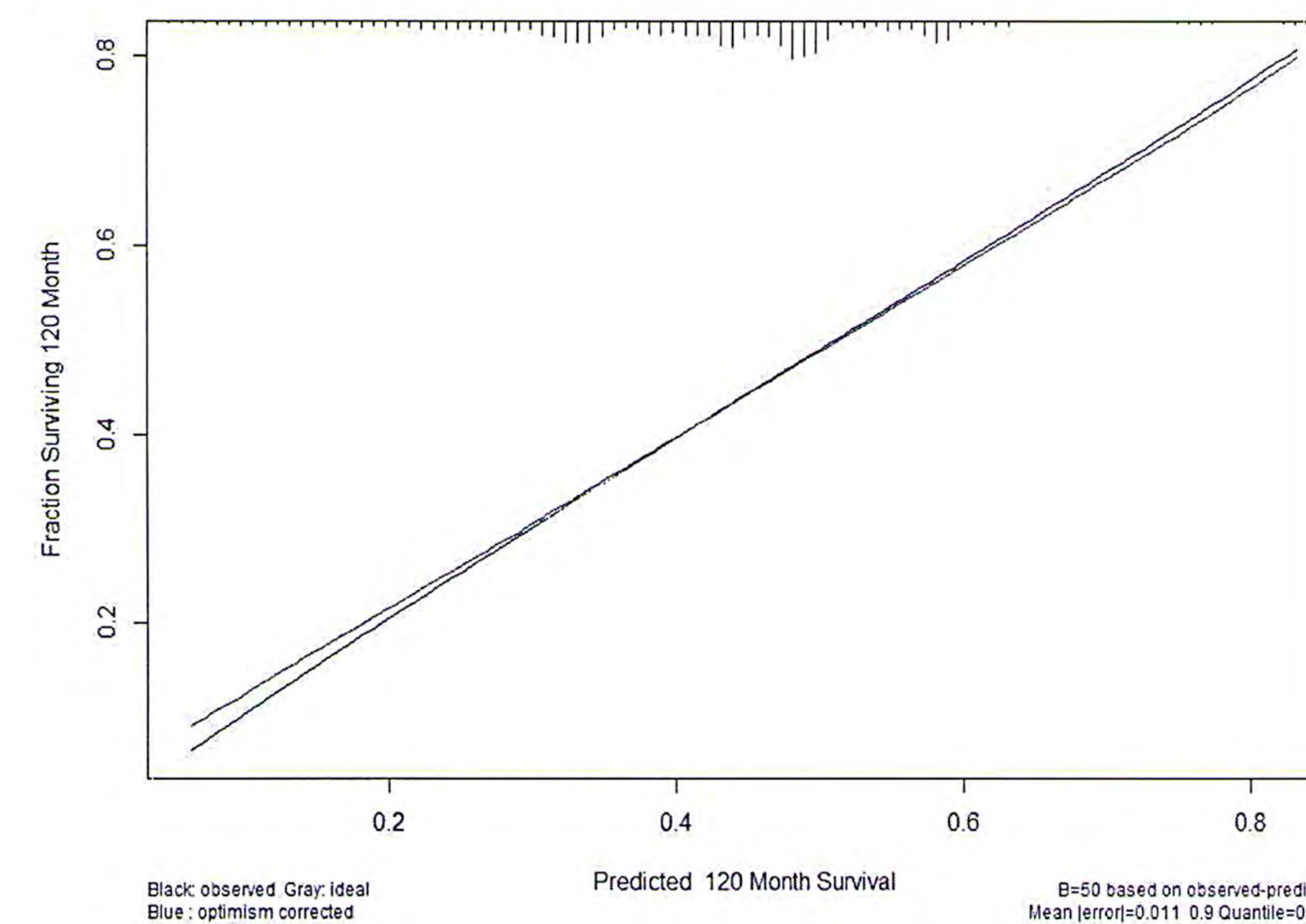
Actual Probability of Colostomy-free Survival



Nomogram of Overall Survival



Actual Probability of Overall Survival



CONCLUSION

A nomogram can predict OS and CFS over lifetime. Such outcome prediction tools may potentially be used as prognostic and decision support tools to guide therapy and predict patients that may need surgery in their lifetime.

REFERENCES

1. www.cancer.gov (seer.cancer.gov/statfacts)
2. Nigro ND, Vaitkevicius VK, Buroker T, Bradley GT, Considine B. "Combined therapy for cancer of the anal canal". *Dis. Colon Rectum*. 1981;24:73–5.