

Risk factors for postoperative systemic inflammatory response syndrome after radical prostatectomy: development and internal validation of a prediction model

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Abstract

Aim

Exploring the risk factors for systemic inflammatory response syndrome in prostate cancer patients after radical surgery, establishing a risk warning model, and validating it.

Methods

A prospective selection was conducted on 309 patients who underwent radical prostatectomy in our hospital from March 2023 to March 2025. They were divided into two groups based on whether SIRS occurred after surgery: the SIRS group ($n = 46$) and the non-SIRS group ($n = 263$). Logistic regression analysis was performed on possible related factors to construct a column chart risk model. Internal validation of the column chart model for predicting postoperative SIRS was performed using the Bootstrap method with 1000 repeated samples.

Results

The results of multivariate logistic regression analysis showed that operative time, diabetes mellitus, preoperative indwelling catheterization, urinary catheter retention time, pathologic diagnosis ($OR > 1$, $P < 0.05$). A column chart prediction model was established based on the risk factors affecting postoperative SIRS, and internal validation was performed using bootstrap method with 1000 repeated samples. The predicted values of the calibration curve were basically consistent with the actual values, and the Hosmer Lemeshow goodness of fit test was performed $\chi^2 = 11.851$, $P = 0.158$, the area under the ROC curve is 0.844 (95%CI: 0.792–0.897).

Conclusions

The occurrence of SIRS in prostate cancer patients after radical surgery is influenced by multiple factors, and the risk warning model established based on these factors has good predictive performance.

Introduction

Prostate cancer (PCa) is a prevalent malignant tumor affecting the male urinary system. Its global incidence has been steadily rising, making it the second most common cancer in men, following lung cancer [1]. Initially, prostate cancer may not show any symptoms. However, as the disease progresses, the tumor enlarges, causing urethral pressure and resulting in urination difficulties [2]. This can also lead to erectile dysfunction and pelvic discomfort, significantly impacting the patient's quality of life and potentially posing safety risks [3]. Thanks to advancements in early screening and diagnostic techniques, most patients can now undergo surgical treatment in the early stages [4]. Nonetheless,

elderly patients undergoing radical prostatectomy are at risk of developing Systemic Inflammatory Response Syndrome (SIRS) due to their compromised immune function, metabolic issues, and weakened defense and repair mechanisms post-surgery [5]. SIRS not only hampers postoperative recovery but also extends hospital stays, causing significant physical and mental distress to patients [6]. Therefore, identifying and addressing the risk factors for postoperative SIRS in PCa patients promptly is crucial. Previous studies have explored the risk factors and bacterial profiles of postoperative hospital infections in PCa patients [7–8]. However, research on systemic inflammatory response syndrome in prostate cancer is limited, and there is no applicable prognostic model. Therefore, making tailored predictions remains a clinical issue. This study prospectively collected clinical data from 309 patients who underwent radical prostatectomy in a urology department in Chongqing, China, to explore the risk factors for postoperative complications of SIRS and establish a risk prediction column chart model.

Materials and Methods

Study design and inclusion criteria

Oral and written information about the study were distributed to each participating patient. We collected informed written consent from each participant who did not object to the study. This study was approved by the Ethics Review Committee of the Army Military Medical University (202211101). This prospective study was conducted in our hospital and identified patients who underwent radical prostatectomy for prostate cancer between January 2023 and January 2025.

Inclusion criteria for this study require patients to be diagnosed with prostate cancer through pathological diagnosis, have undergone radical prostatectomy, be over 45 years old, and have complete clinical and pathological data. The diagnosis of prostate cancer must adhere to the diagnostic criteria set by the National Cancer Network (NCCN) in the United States, and patients must provide informed consent. Exclusion criteria include patients with other malignant tumors, immune system diseases, serious visceral dysfunction, acute or chronic infectious diseases, long-term use of certain medications, and incomplete personal clinical and laboratory indicators. Cases meeting all inclusion criteria and not meeting any exclusion criteria will be included in the study.

The diagnostic criteria for SIRS were as follows: (1) temperature $< 36^{\circ}\text{C}$ or $> 38^{\circ}\text{C}$; (2) pulse > 90 beats/min; (3) respiration > 20 breaths/min; (4) white blood cell count $> 12 \times 10^9/\text{L}$ or $< 3 \times 10^9/\text{L}$; any two of these were diagnostic for SIRS [9].

Research instrument

A general information survey form was developed specifically for this study by our research team, based on a comprehensive literature review and expert consultation. Using this form, we retrospectively reviewed the patients' medical records to collect the following baseline and clinical variables: age, body mass index (BMI), prostate-specific antigen (PSA), prostate volume, pathological diagnosis, surgical

method, surgical time, intraoperative blood loss, positive surgical margin, educational level, admission systolic blood pressure, and medical history.

Preoperative anxiety was assessed using the previously validated Zung Self-Rating Anxiety Scale (SAS) [10]. This 20-item scale employs a 4-point Likert scale (ranging from 1 to 4). The raw total score was summed and converted to a standardized index score (ranging from 25 to 100), with higher scores reflecting greater anxiety severity; the standardized score was treated as a continuous variable in our analysis.

Additional postoperative data were also collected, including catheter type, catheter balloon injection volume, postoperative constipation, pelvic floor muscle training, abdominal hot compress, occurrence of bladder spasms, presence of SIRS, blood culture results, and drug susceptibility test results.

Survey method

Clinical data from patients undergoing prostate cancer surgery is collected by trained researchers, with some data sourced from electronic medical records and telephone follow-up. A double check during data entry is necessary to maintain data accuracy.

Statistical analysis

The data were analyzed using SPSS 21.0 statistical software. Quantitative data that met normality were presented as mean $\pm$ standard deviation ($\bar{x} \pm s$) and analyzed using t-tests. Qualitative data were expressed as number of cases and percentage (%). Chi-square tests were performed with SIRS post-radical prostatectomy as the dependent variable and significant differences in univariate analysis as independent variables. Logistic regression was used to identify independent risk factors. A risk warning score model, receiver operating characteristic (ROC) curve, and decision curve analysis (DCA) for survival data were generated using RStudio 4.2.1. The Hosmer-Lemeshow goodness-of-fit test and calibration curve were used to assess model consistency, with statistical significance set at $p < 0.05$ for model validation.

Results

Univariate analysis of SIRS after prostate cancer surgery

In our study of 309 prostate cancer patients undergoing radical prostatectomy, SIRS were observed in 14.89% of cases. There were no statistically significant differences ($P > 0.05$) between the SIRS and non-SIRS groups in terms of various demographic and clinical factors such as age, surgical method, preoperative PSA levels, prostate volume, BMI, presence of positive surgical margins, TNM staging, type of urinary catheter used, preoperative pelvic floor muscle training, anxiety levels, hypertension, and postoperative complications like bladder bleeding. However, significant differences ($P < 0.05$) were noted

between the two groups in variables such as operative time, intraoperative bleeding volume, urinary catheter retention time, presence of diabetes mellitus, history of preoperative indwelling catheterization, and pathological diagnosis. These findings are summarized in Table 1.

Table 1
Univariate analysis of SIRS in patients with prostate cancer after radical surgery

Variable	SIRS (n = 46)	No-SIRS (n = 263)	χ^2/t	p - value
Age, (years)	66.96 ± 7.127	68.25 ± 7.332	1.106	0.270
Robot surgery, (n%)	16 (34.78%)	120 (45.63%)	1.869	0.113
Preoperative PSA, (ng/ml)	21.05 ± 19.106	24.24 ± 32.966	0.918	0.361
Operative time, (min)	206.85 ± 79.018	180.76 ± 52.640	-2.157	0.036
Preoperative prostate volume, (ml)	36.26 ± 22.042	32.44 ± 16.880	-1.116	0.269
BMI, (kg/m2)	25.20 ± 3.263	24.50 ± 3.215	-1.346	0.183
Intraoperative bleeding volume, (ml)	323.04 ± 190.565	255.02 ± 174.826	-2.260	0.028
Positive surgical margin after surgery, (n%)	7 (15.22%)	43 (16.35%)	0.037	0.524
TNM, (n%)			1.018	0.318
T1	12 (26.09%)	56 (21.29%)		
T2	24 (52.17%)	133 (50.57%)		
T3	10 (21.74%)	74 (28.14%)		
Urinary catheter model, (≥ 20)	26 (56.52%)	157 (59.70%)	0.163	0.402
Preoperative pelvic floor muscle training, (n%)	27 (58.70%)	164 (62.36%)	0.222	0.376
Urinary catheter retention time, (d)	18.07 ± 6.920	13.76 ± 6.519	3.929	<0.001
Preoperative anxiety	53.72 ± 7.571	52.26 ± 7.476	-1.207	0.228
Hypertension (n, %)	21 (45.65%)	96 (36.50%)	1.393	0.155
Diabetes mellitus (n, %)	17 (36.96%)	27 (10.27%)	22.839	<0.001
Preoperative indwelling catheterization (n, %)	21 (45.65%)	57 (21.67%)	11.930	0.001
Postoperative bladder bleeding, (n%)	4 (8.70%)	14 (5.32%)	0.812	0.272
Gleason, (GS > 7)	31 (67.39%)	113 (42.97%)	9.387	0.002

Multivariate logistic regression analysis of SIRS after prostate cancer surgery

Perform logistic regression analysis with SIRS in prostate cancer patients after radical surgery as the dependent variable and variables with $P < 0.2$ as independent variables in univariate analysis. The results showed that operative time, diabetes mellitus, preoperative indwelling catheterization, urinary catheter retention time, pathologic diagnosis were independent risk factors for SIRS in prostate cancer patients after radical surgery ($OR > 1$, $P < 0.05$), as shown in Table 2.

Table 2

Multivariate Logistic regression analysis of SIRS in patients with prostate cancer after radical surgery

Variable	β	SE	wald χ^2	P Value	OR(%95CI)
Robot surgery	-0.700	0.403	3.017	0.082	0.497 (0.226–1.094)
Operative time, (min)	0.013	0.003	14.086	<0.001	1.013 (1.006–1.020)
Intraoperative bleeding volume, (ml)	0.001	0.001	2.519	0.112	1.001 (1.000–1.003)
BMI, (kg/m ²)	0.027	0.052	0.270	0.604	1.027 (0.928–1.137)
Diabetes mellitus (n, %)	2.111	0.446	22.438	<0.001	8.254 (3.447–19.768)
Preoperative indwelling catheterization (n, %)	1.341	0.414	10.508	0.001	3.824 (1.699–8.604)
Urinary catheter retention time, (d)	0.073	0.027	7.119	0.008	1.075 (1.019–1.134)
Pathologic diagnosis, (GS > 7)	0.971	0.397	5.991	0.014	2.642 (1.214–5.750)
Hypertension (n, %)	0.545	0.396	1.897	0.168	1.725 (0.794–3.749)

Line chart of the risk warning score model for SIRS in prostate cancer patients after radical surgery

Based on the 5 factors derived from logistic regression analysis, a risk prediction column chart for SIRS in prostate cancer patients following radical surgery was created using Rstudio 4.2.1, as shown in Fig. 1. In clinical practice, when combined with patient data, the appropriate indicator score points are employed as vertical lines that stretch towards the "total score" standard scoring axis. The scores from each indication are totaled together, and a vertical line is drawn downward along the "risk probability" direction at the places on the total scoring axis. The calculated score represents the chance of SIRS in prostate cancer patients following aggressive surgery.

Validation of a Column Chart Model for Predicting Postoperative SIRS in Prostate Cancer Patients

The area under the ROC curve was used to evaluate the discriminability of the column chart model for predicting postoperative SIRS. The area under the ROC curve was 0.844 (95%CI: 0.792–0.897). See Fig. 2. Internal validation of the column chart model for predicting postoperative SIRS was performed using the Bootstrap method with 1000 repeated samples. The results showed that the calibration curve of the column chart model (Fig. 3) was consistent with the actual values, and the Hosmer Lemeshow goodness of fit test was performed $\chi^2 = 11.851$, $P = 0.158$. The column chart model has good accuracy and discrimination in predicting postoperative SIRS in patients with prostate cancer. The optimal threshold probability was identified where the model's DCA curve was above the reference lines, indicating that the model's predictions were clinically useful and should guide decision making. The DCA curve showed that the nomograph model had a wide range of high-risk thresholds and was superior to the Treat None and Treat All strategies (Fig. 4).

Discussion

SIRS is an exaggerated defensive response of the body to harmful stimuli, resulting from an imbalanced inflammatory response. Clinicians can diagnose and treat a range of clinical symptoms, such as increased heart rate, respiratory rate, and body temperature [11]. Prostate cancer is a disease associated with aging, where elderly patients may experience delayed immunity, delayed changes in inflammatory response in various organs in the early stages, and delayed clinical manifestations, leading to a delayed onset of SIRS [12]. Despite the severity of symptoms and poor prognosis, the incidence of postoperative SIRS in prostate cancer patients in this study was 14.89%, aligning with previously reported rates ranging from 6.8% to 63.3% [13]. These findings suggest a relatively high overall incidence of SIRS in patients undergoing radical prostatectomy. Therefore, personalized prediction of postoperative SIRS and the implementation of targeted preventive measures are crucial for improving the quality of life for patients undergoing prostate cancer surgery.

Our research findings support the correlation between surgical time and the occurrence of postoperative SIRS, aligning with both domestic and international studies [14–15]. Variations in surgical duration among patients and surgeons can lead to differences in anesthesia time and increase the risk of bacterial invasion through repeated contact between surgical instruments and the puncture site, both contributing to postoperative SIRS [16]. Thus, it is essential to tailor surgical plans to individual patient conditions and enhance operator skills to mitigate these risks.

Preoperative catheterization and catheterization duration are identified as independent risk factors. Catheterization, being an invasive procedure, has the potential to harm the urethral mucosal barrier, diminish its protective capacity, compromise its ability to fend off pathogens, and consequently lead to postoperative infections [17]. The intubation process, along with associated procedures, may inflict damage on the urethral mucosa, disrupt its barrier function, and compromise its defense against

pathogens [18]. The contact between the wound and the catheter can facilitate the adherence of blood clots and tissue exudate to the catheter, thereby fostering bacterial colonization and growth. Prolonged presence of the indwelling catheter can result in an increased influx of bacteria into the body through the catheter, potentially leading to infections such as urethra [19].

Diabetes is a systemic disease that can lead to immune dysfunction due to long term hyperglycemia [20]. This dysfunction can reduce the ability of inflammatory cells like neutrophils and macrophages to perform essential functions such as chemotaxis, adhesion, and phagocytosis during inflammation [21]. As a result, the body's response to pathogenic bacteria may be slowed down, compromising human resistance [22]. This study found that the prevalence of diabetes in patients with Systemic Inflammatory Response Syndrome (SIRS) was significantly higher at 36.96% compared to 10.27% in the non-SIRS group. This suggests that diabetic patients are more likely to develop SIRS when bacterial infections occur compared to non-diabetic patients. The study recommends that patients with poorly controlled blood sugar levels should undergo surgery promptly after achieving stable blood sugar control. For patients requiring surgery within a specific timeframe, insulin treatment should be initiated upon admission, and blood sugar levels should be closely monitored before the surgical procedure.

Our study shows that the Gleason score is associated with systemic inflammatory response. Inflammation is closely linked to the occurrence and progression of tumors. On one hand, inflammation can stimulate excessive tissue cell proliferation, while on the other hand, the body's immune response to inflammation can also promote the production and spread of tumor cells, ultimately leading to tumor invasion and metastasis [23]. Research indicates that patients with elevated levels of C-reactive protein (CRP) tend to have higher Gleason scores. Gleason scores not only help predict the likelihood of developing castration-resistant prostate cancer in prostate cancer patients, but also provide an estimate of the approximate time frame for developing this type of cancer [24]. Furthermore, the accuracy and sensitivity of Gleason scores in predicting castration-resistant prostate cancer surpass those of CRP alone [25].

Column charts can visually represent complex regression equations, aiding in the interpretation of predictive models and assisting clinical physicians in patient risk assessment. This study developed a nomogram model based on 5 independent risk factors for SIRS following radical prostatectomy, including operative time, diabetes mellitus, preoperative indwelling catheterization, urinary catheter retention time, and pathologic diagnosis. Internal validation using the Bootstrap method confirmed the reliability of the column chart model, with predicted values closely aligning with measured values. The high AUC value of 0.844 (95% CI: 0.792–0.897) suggests strong discrimination in the column chart model, highlighting its effectiveness in predicting SIRS risk.

Limitations

The study has limitations as it is conducted at a single center with a small sample size, indicating the need for further research to increase the sample size. Moreover, the model has not undergone external

validation due to constraints in research time and data collection. Therefore, the generalizability of the column chart prediction model for postoperative SIRS in prostate cancer needs to be confirmed through multicenter studies.

Conclusions

The column chart prediction model, developed using risk factors that influence postoperative SIRS in prostate cancer patients, shows high accuracy and discrimination in predicting postoperative SIRS in patients undergoing prostate cancer surgery. This model can provide valuable insights for preventing such complications.

Declarations

Ethics approval and consent to participate:

The protocol, case record form, and informed consent form were reviewed by the Ethics Committee of the Second Affiliated Hospital of Army Medical University. Written informed consent was obtained from all participants before enrolment. The study was conducted in accordance with principles of the Declaration of Helsinki. Confidentiality of all the data was maintained.

Consent for publication:

Consent for publication was obtained from all participants.

Availability of data and materials

The datasets during and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests:

The authors declare no conflicts of interest or financial ties to disclose.

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Author Contribution

Study design:Zheng Ji

Conceptualization and first author: Chen Yu,Luo Chen

Statistics: Chen Yu, Luo Chen

Data collection: Luo Chen,Li Siyue, Zhu Jingzhen

Review and editing: Zheng Ji

Acknowledgements:

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Data Availability

All data supporting the findings of this study are available within the paper and its Supplementary Information.

References

1. Sartor O, de Bono J, Chi KN, Fizazi K, Herrmann K, Rahbar K, Tagawa ST, Nordquist LT, Vaishampayan N, El-Haddad G, Park CH, Beer TM, Armour A, Pérez-Contreras WJ, DeSilvio M, Kpamegan E, Gericke G, Messmann RA, Morris MJ, Krause BJ. VISION Investigators. Lutetium-177-PSMA-617 for Metastatic Castration-Resistant Prostate Cancer. *N Engl J Med*. 2021;385(12):1091–103. 10.1056/NEJMoa2107322.
2. Williams IS, McVey A, Perera S, O'Brien JS, Kostos L, Chen K, Siva S, Azad AA, Murphy DG, Kasivisvanathan V, Lawrentschuk N, Frydenberg M. Modern paradigms for prostate cancer detection and management. *Med J Aust*. 2022;217(8):424–33. 10.5694/mja2.51722. . Epub 2022 Oct 2.
3. Parker C, Castro E, Fizazi K, Heidenreich A, Ost P, Procopio G, Tombal B, Gillessen S, ESMO Guidelines Committee. Electronic address: clinicalguidelines@esmo.org. Prostate cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2020;31(9):1119–34. 10.1016/j.annonc.2020.06.011.
4. Adamaki M, Zoumpourlis V. Prostate Cancer Biomarkers: From diagnosis to prognosis and precision-guided therapeutics. *Pharmacol Ther*. 2021;228:107932. 10.1016/j.pharmthera.2021.107932.

5. Rundle AG, Sadasivan SM, Chitale DA, Gupta NS, Williamson SR, Kryvenko ON, Chen Y, Bobbitt K, Tang D, Rybicki BA. Racial differences in the systemic inflammatory response to prostate cancer. *PLoS ONE*. 2021;16(7):e0252951. 10.1371/journal.pone.0252951.
6. Margraf A, Ludwig N, Zarbock A, Rossaint J. Systemic Inflammatory Response Syndrome After Surgery: Mechanisms and Protection. *Anesth Analg*. 2020;131(6):1693–707. 10.1213/ANE.0000000000005175.
7. Adhyatma KP, Prapiska FF, Siregar GP, Warli SM. Systemic Inflammatory Response in Predicting Prostate Cancer: The Diagnostic Value of Neutrophil-To-Lymphocyte Ratio. *Open Access Maced J Med Sci*. 2019;7(10):1628–30. 10.3889/oamjms.2019.177.
8. McArdle PA, Qayyum T, McMillan DC. Systemic inflammatory response and survival in patients with localised prostate cancer: 10-year follow-up. *Urol Int*. 2010;84(4):430–5. 10.1159/000313364.
9. Koirala U, Thapa PB, Joshi MR, Singh DR, Sharma SK. Systemic Inflammatory Response Syndrome following Gastrointestinal Surgery. *JNMA J Nepal Med Assoc* 2017 Apr-Jun;56(206):221–5.
10. Zung WW. A rating instrument for anxiety disorders. *Psychosomatics*. 1971;12(6):371–9. 10.1016/S0033-3182(71)71479-0.
11. Balk RA. Systemic inflammatory response syndrome (SIRS): where did it come from and is it still relevant today? *Virulence*. 2014;5(1):20–6. 10.4161/viru.27135.
12. Dolan RD, Laird BJA, Horgan PG, McMillan DC. The prognostic value of the systemic inflammatory response in randomised clinical trials in cancer: A systematic review. *Crit Rev Oncol Hematol*. 2018;132:130–7. 10.1016/j.critrevonc.2018.09.016.
13. Peng H, Luo X. Prognostic significance of elevated pretreatment systemic inflammatory markers for patients with prostate cancer: a meta-analysis. *Cancer Cell Int*. 2019;19:70. 10.1186/s12935-019-0785-2.
14. Sugita J, Fujiu K. Systemic Inflammatory Stress Response During Cardiac Surgery. *Int Heart J*. 2018;59(3):457–9. 10.1536/ihj.18-210.
15. Silva ML, Ribeiro AF, Sato FRL, Moreira RWF. Prevalence of the systemic inflammatory response syndrome in patients who underwent orthognathic surgery. *Oral Maxillofac Surg*. 2018;22(2):193–6. 10.1007/s10006-018-0692-z.
16. Uchida Y, Takazawa R, Kitayama S, Tsujii T. Predictive risk factors for systemic inflammatory response syndrome following ureteroscopic laser lithotripsy. *Urolithiasis*. 2018;46(4):375–81. 10.1007/s00240-017-1000-3.
17. Chenoweth CE, Urinary Tract I. 2021 Update. *Infect Dis Clin North Am*. 2021;35(4):857–870. 10.1016/j.idc.2021.08.003
18. Kranz J, Schmidt S, Wagenlehner F, Schneidewind L. Catheter-Associated Urinary Tract Infections in Adult Patients. *Dtsch Arztebl Int*. 2020;117(6):83–8. 10.3238/arztebl.2020.0083.
19. Ellahi A, Stewart F, Kidd EA, Griffiths R, Fernandez R, Omar MI. Strategies for the removal of short-term indwelling urethral catheters in adults. *Cochrane Database Syst Rev*. 2021;6(6):CD004011. 10.1002/14651858.CD004011.pub4.

20. Atkinson M, Lansdown AJ. Endocrine immune-related adverse events: Adrenal, parathyroid, diabetes insipidus, and lipoatrophy. *Best Pract Res Clin Endocrinol Metab.* 2022;36(3):101635. 10.1016/j.beem.2022.101635.
21. Joshi G, Das A, Verma G, Guchhait P. Viral infection and host immune response in diabetes. *IUBMB Life.* 2024;76(5):242–66. 10.1002/iub.2794. . Epub 2023 Dec 8.
22. Mehta P, Gasparyan AY, Zimba O, Kitas GD, Yessirkepov M. Interplay of diabetes mellitus and rheumatic diseases amidst the COVID-19 pandemic: influence on the risk of infection, outcomes, and immune responses. *Clin Rheumatol.* 2022;41(12):3897–913. 10.1007/s10067-022-06365-y. . Epub 2022 Sep 9.
23. Singh N, Baby D, Rajguru JP, Patil PB, Thakkannavar SS, Pujari VB. Inflammation and cancer. *Ann Afr Med.* 2019 Jul-Sep;18(3):121–6. 10.4103/aam.aam_56_18.
24. Jensen GL, Naziri J, Hammonds KP, Jhavar SG, Swanson G. C-Reactive Protein Is a Poor Marker of Baseline Inflammation in Prostate Cancer and Response to Radiotherapy or Androgen Ablation. *Cureus.* 2021;13(11):e19639. 10.7759/cureus.19639.
25. Wang Y, Gapstur SM, Newton CC, McCullough ML, Pollak MN, Campbell PT. Biomarkers of Glucose Homeostasis and Inflammation with Risk of Prostate Cancer: A Case-Cohort Study. *Cancer Epidemiol Biomarkers Prev.* 2022;31(4):736–43. 10.1158/1055-9965.EPI-21-1060.

Figures

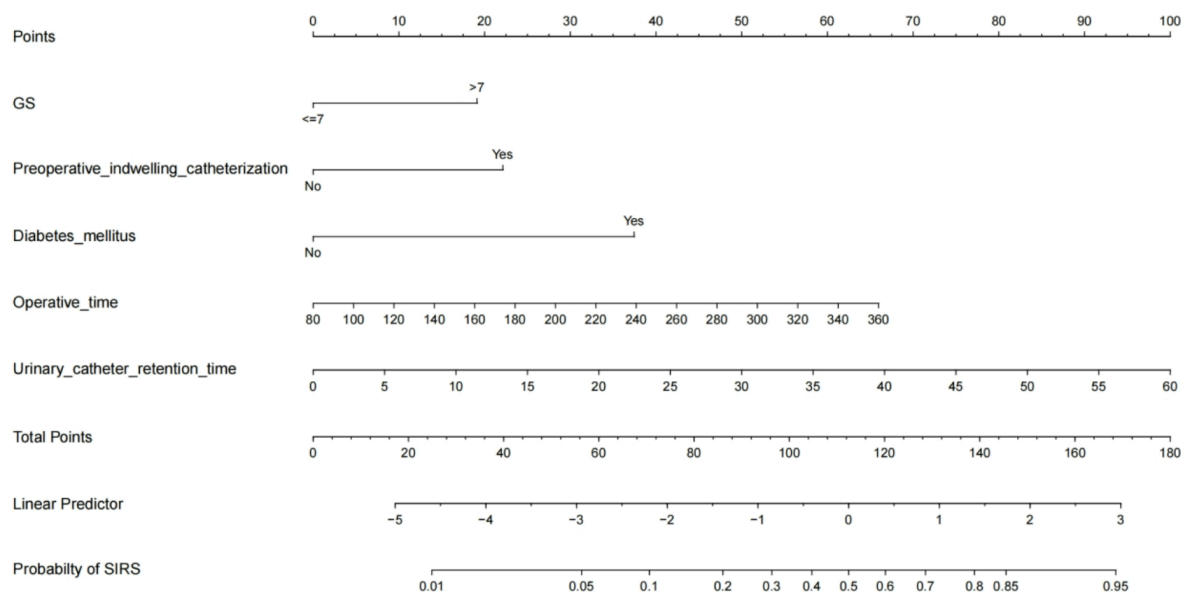


Figure 1

Risk warning column chart for SIRS in prostate cancer patients after radical surgery

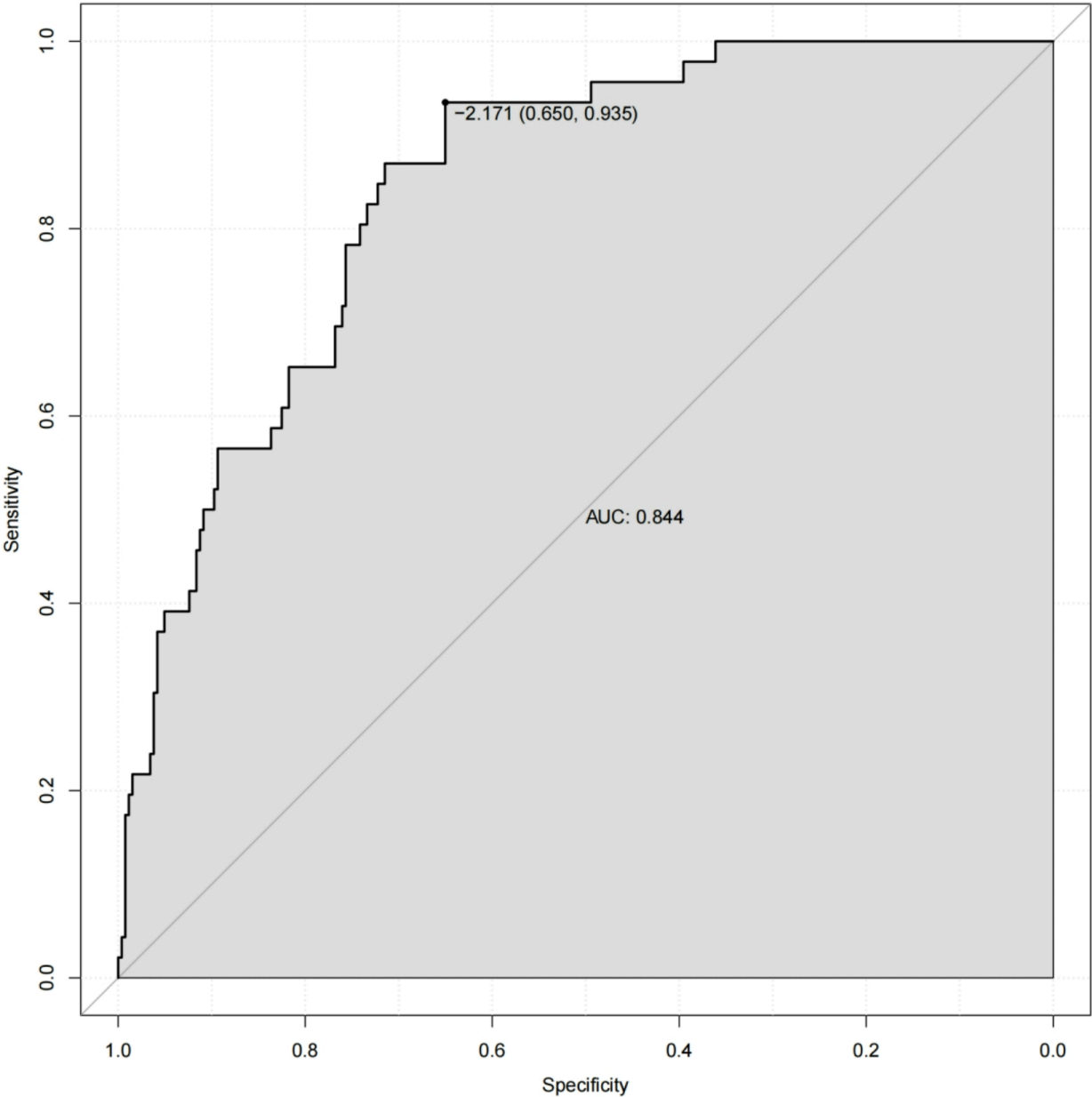


Figure 2

ROC curve of the risk column chart model for SIRS in prostate cancer patients after radical surgery

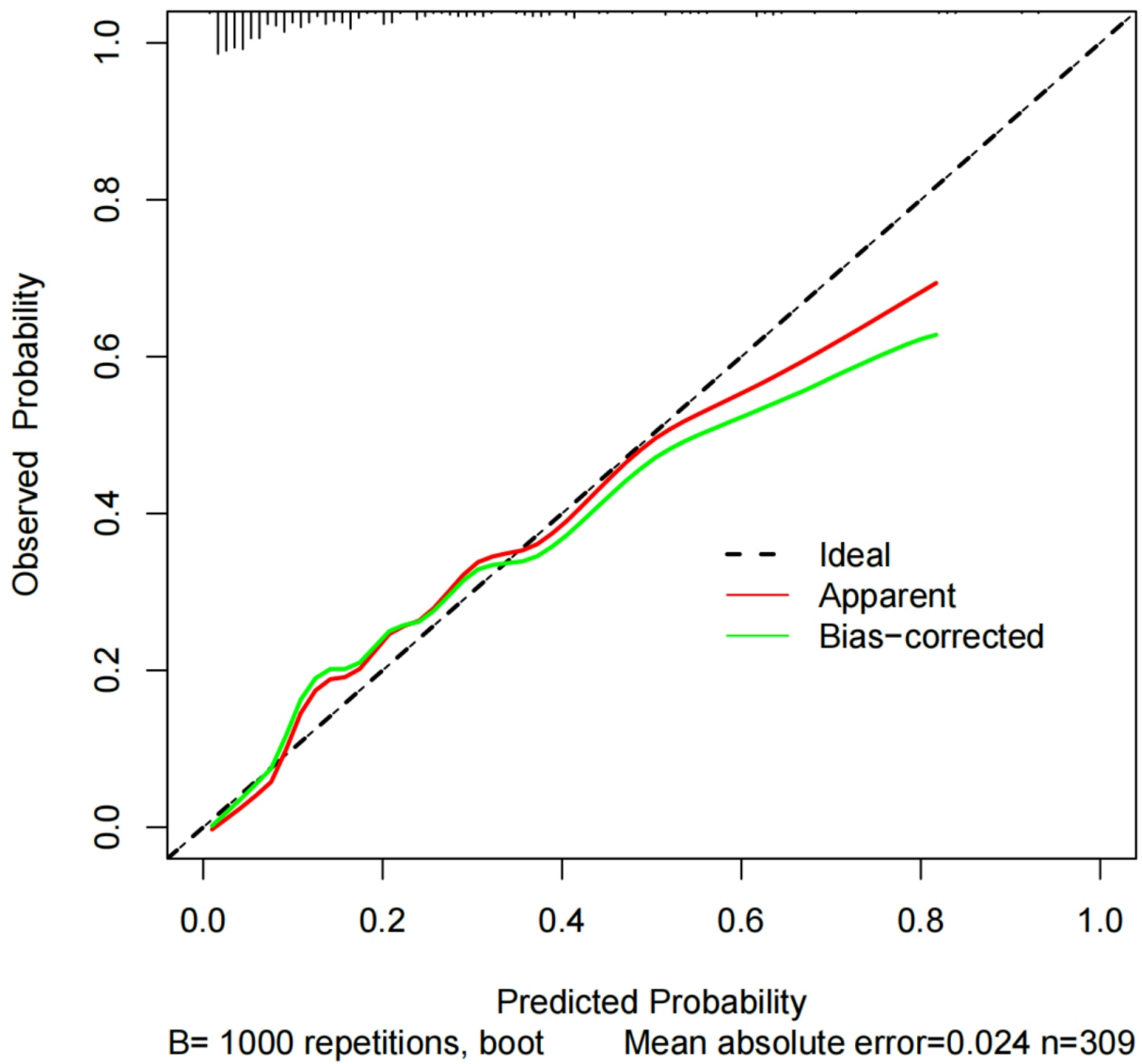


Figure 3

Calibration curve for predicting postoperative SIRS

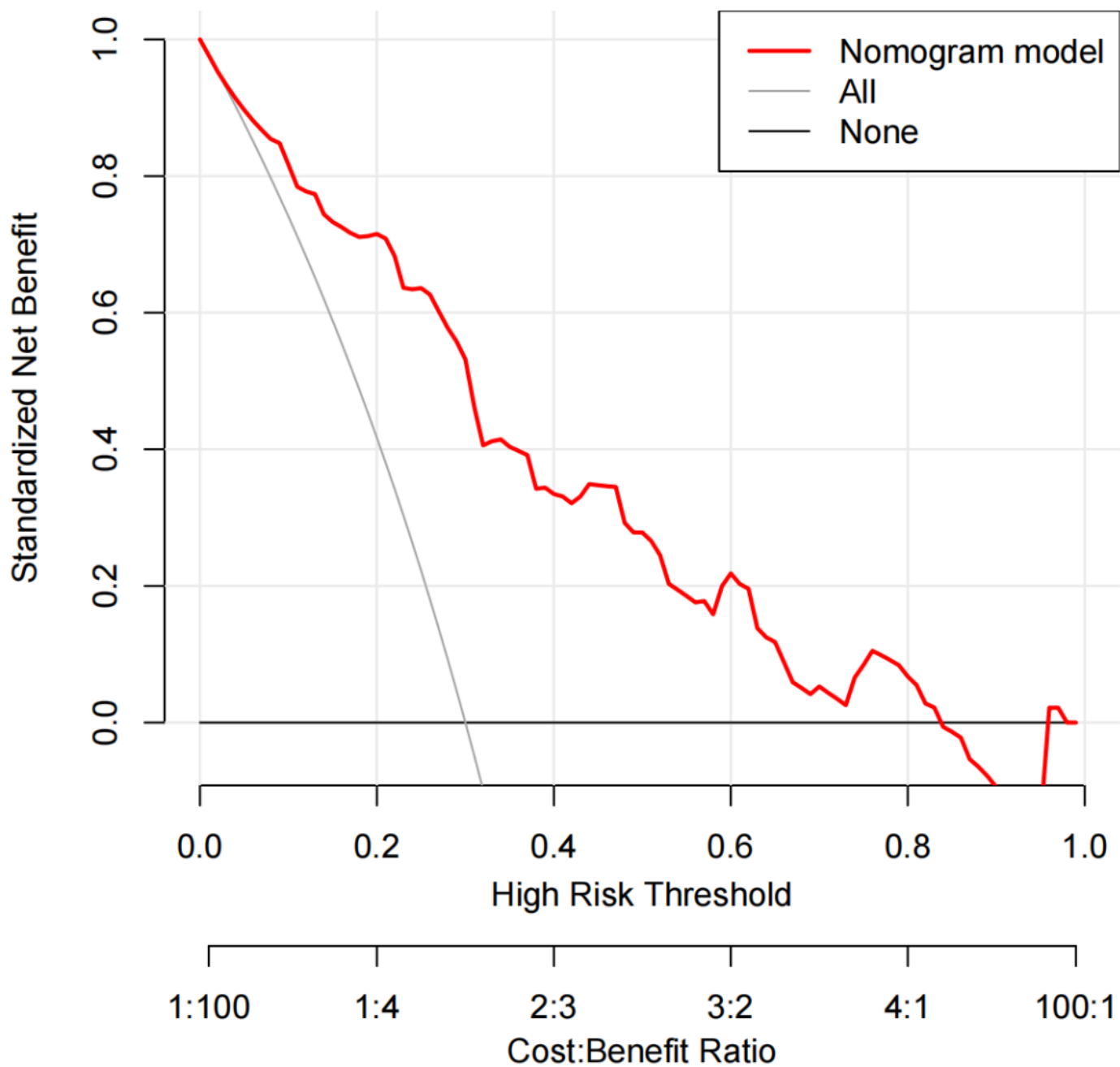


Figure 4

DCA decision curve of the risk line graph model for SIRS in prostate cancer patients after radical surgery

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [S1ClinicalDataCollectionFormforRadicalProstatectomyPatients.docx](#)