Table S1 The result of Boruta algorithm based on 1,887 patients
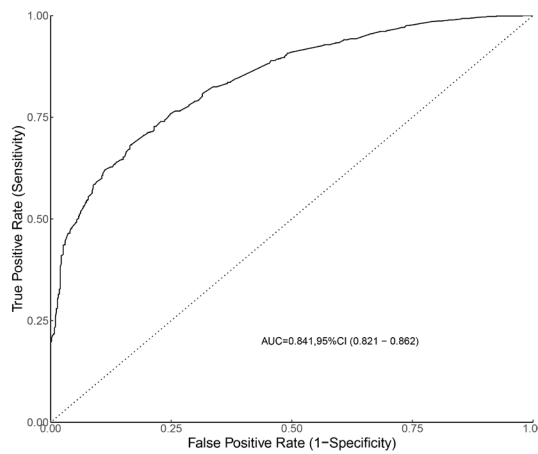
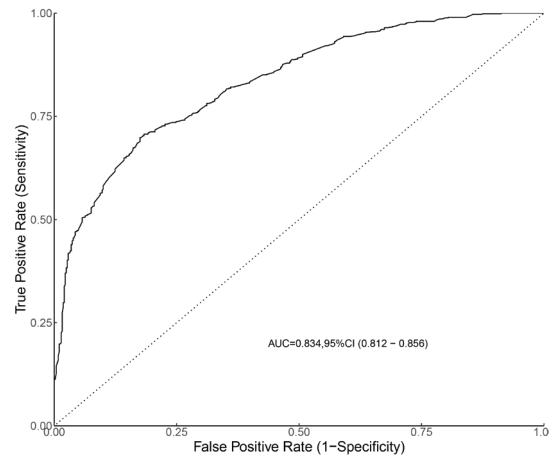| Feature	meanImp	medianImp	minImp	maxImp	normHits	Decision
Gender	-0.48719567	-0.298924088	-3.441571742	0.978727317	0	Rejected
Histology	1.997096791	1.840971164	-1.8959005	5.239268081	0.151515152	Rejected
Brain metastasis	2.296892301	2.30698654	0.654852422	3.705386616	0.232323232	Rejected
Chemotherapy	4.144450166	4.074413004	1.288668017	8.799562656	0.606060606	Tentative
The number of regional lymph nodes removed	4.872458846	4.858219727	1.369235834	8.438497567	0.747474747	Confirmed
Grade	5.365614551	5.40414417	0.399182156	9.348554039	0.787878788	Confirmed
Radiation	7.638949356	7.618053841	3.504391155	10.44616523	0.95959596	Confirmed
Surgery	9.205328349	9.261176518	6.268269947	12.03314613	0.97979798	Confirmed
Lung metastasis	11.50821744	11.35524867	9.115069359	14.42764647	1	Confirmed
Tumor size	11.97565117	11.89897031	7.589840263	15.52168394	0.98989899	Confirmed
Bone metastasis	12.62166167	12.61596492	11.04558356	15.01439323	1	Confirmed
Liver metastasis	14.00488627	13.98070355	12.01288674	17.0642424	1	Confirmed
T Stage	24.395441	24.39068796	20.77471449	27.75835958	1	Confirmed
N Stage	30.20551625	30.26335738	25.84439048	34.01834963	1	Confirmed
Age	57.35618807	57.39855331	52.57024386	62.90732771	1	Confirmed

Imp, Importance.

Table S2 The result of Boruta algorithm based on 1,715 patients

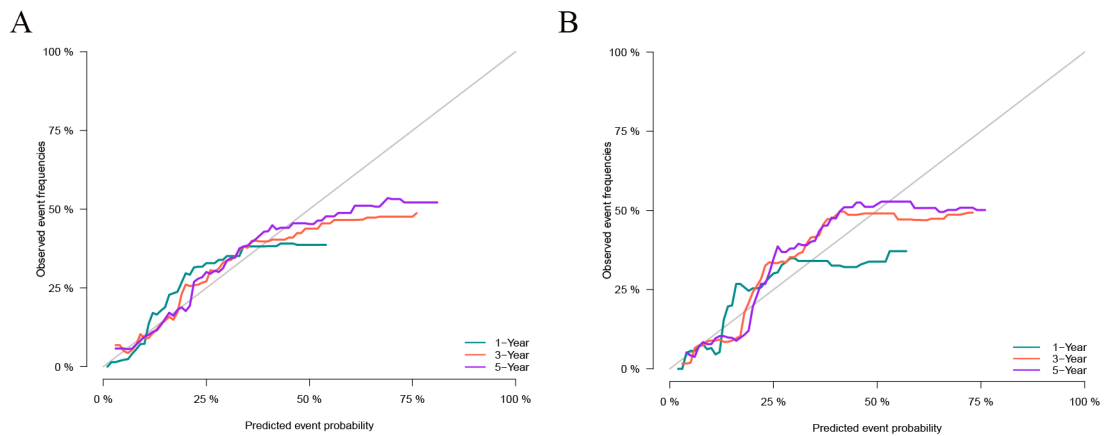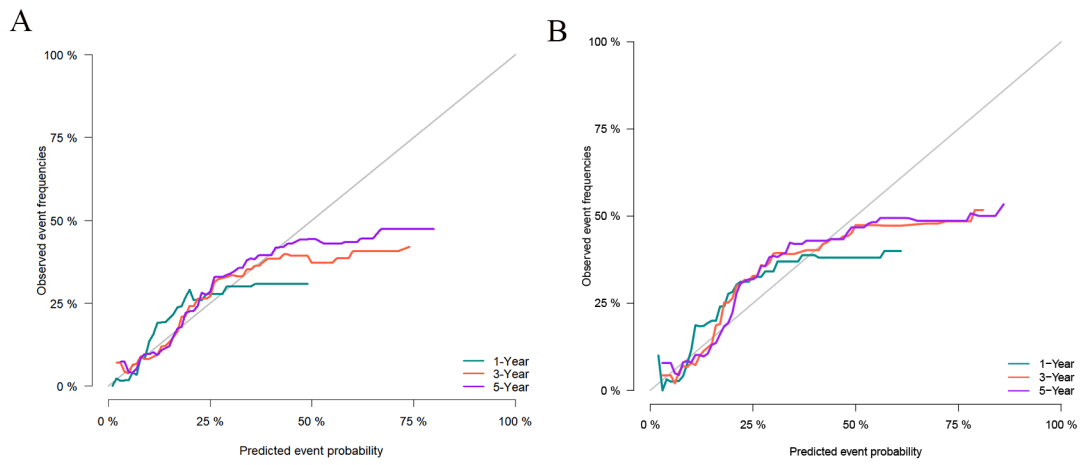| Feature	meanImp	medianImp	minImp	maxImp	normHits	Decision
Gender	-0.645377043	-0.941438421	-2.058720108	1.003529925	0	Rejected
Histology	1.191123035	1.16685416	-1.216961195	4.584287593	0.02020202	Rejected
Surgery	3.884848018	3.936757656	1.221108557	7.366432979	0.626262626	Tentative
Chemotherapy	3.97550171	4.050129645	-0.2105527	8.857965323	0.686868687	Confirmed
Grade	4.75298052	4.809884014	-0.878562386	8.287182405	0.818181818	Confirmed
Radiation	4.756491242	4.856740905	1.387865664	8.47446449	0.777777778	Confirmed
The number of regional lymph nodes removed	4.929668309	5.012836382	-0.175226436	9.660014851	0.767676768	Confirmed
Tumor size	8.385797185	8.165224697	3.94960725	13.83625111	0.97979798	Confirmed
T Stage	22.25385213	22.26376865	18.51732241	26.16833635	1	Confirmed
N Stage	24.47958986	24.45262567	21.46012467	28.30968895	1	Confirmed
Age	59.76241704	60.00377348	53.85808124	67.26919028	1	Confirmed

Imp, Importance.

Figure S1 ROC curve of XGBoost based on metastatic and non-metastatic renal pelvic TCC patients. ROC, receiver operating characteristic; XGBoost, eXtreme Gradient Boosting; TCC, transitional cell carcinoma; AUC, area under the curve; CI, confidence interval.

Figure S2 ROC curve of XGBoost based on non-metastatic renal pelvic TCC patients. ROC, receiver operating characteristic; XGBoost, eXtreme Gradient Boosting; TCC, transitional cell carcinoma; AUC, area under the curve; CI, confidence interval.

Figure S3 Calibration curves. (A) Calibration curve of the training set based on metastatic and non-metastatic renal pelvic TCC patients; (B) Calibration curve of the validation set based on metastatic and non-metastatic renal pelvic TCC patients. TCC, transitional cell carcinoma.

Figure S4 Calibration curves. (A) Calibration curve of training set based on non-metastatic renal pelvic TCC patients; (B) Calibration curve of validation set based on non-metastatic renal pelvic TCC patients. TCC, transitional cell carcinoma.