

Appendix 1

Postoperative treatment

Drain amylase levels were routinely monitored on postoperative days 1, 3, 5, and 7. Oral nutritional supplements were allowed from postoperative 24–48 hours. Prophylactic somatostatin analogs, proton pump inhibitor and third-generation cephalosporins were routinely given within 5–7 days after operation. All patients underwent abdominal contrast-enhanced computed tomography (CT) on postoperative day 5–7 to evaluate any possible complications. When there is no fluid collection around the anastomosis on the CT images, the drain fluid amylase level is normal, and the daily drain amount is less than 30 mL for 3 consecutive days or more, the surgical drains were removed.

Appendix 2

Acquisition of computed tomography (CT) imaging data

All patients underwent enhanced scanning with Toshiba aquilion one 320-slice CT, fasted for 4–6 hours before scanning, and oral intake of 800 mL warm boiled water to fill the gastric cavity 30 minutes before scanning. Scanning parameters: 120 kV, 350 mAs, the slice thickness of scan, slice distance, and slice thickness of reconstruction were 5, 5 and 1 mm, respectively. After nonenhanced abdominal CT scan, contrast agent (iohexol) (300 mgI/mL) was administered intravenously through the forearm via a high-pressure syringe at a dose of 1.5 mL/kg with an injection flow rate of 3–3.5 mL/s. Arterial-phase (24–30 s) and portal venous-phase (60–70 s) scans were performed after contrast agent injection.

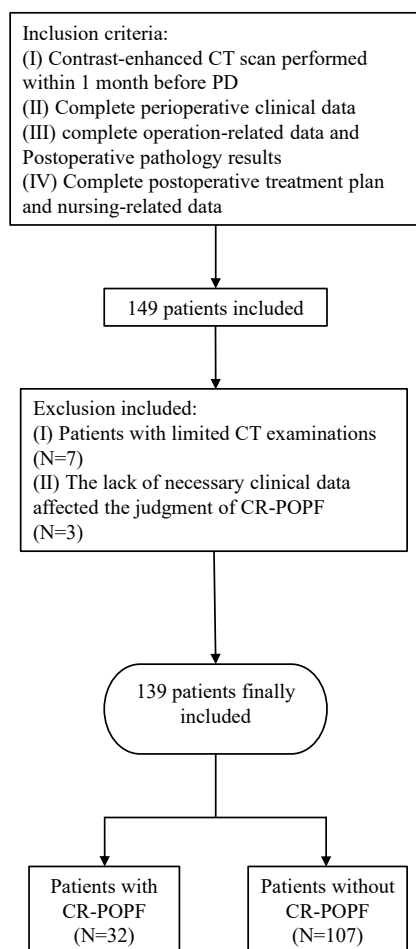


Figure S1 Details in patient inclusion and exclusion. CT, computed tomography; PD, pancreaticoduodenectomy; N, number of patients; CR-POPF, clinically relevant postoperative pancreatic fistula.

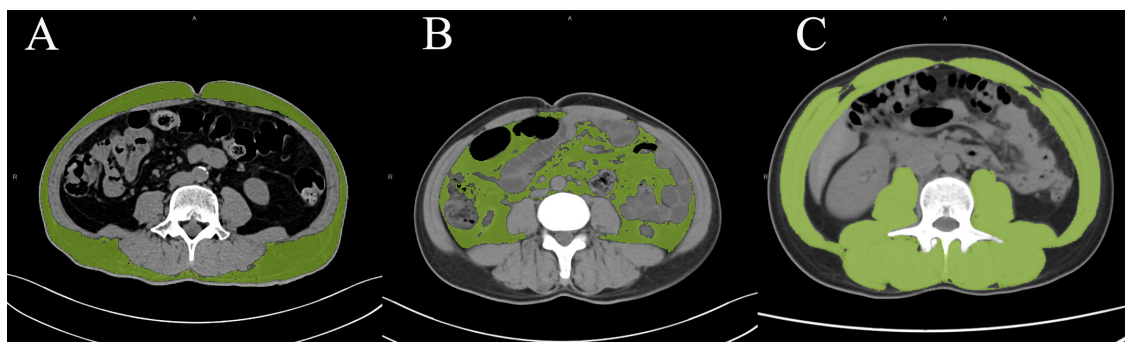


Figure S2 Schematic diagram for obtaining body composition analysis indicators from preoperative CT images. (A) Set the CT value range at the umbilical plane to (-190, 30) HU to obtain the subcutaneous fat area; (B) set the CT value range at the umbilical plane to (-150, -50) HU to obtain the visceral fat area; (C) set the CT value range at the third lumbar plane to (-29, +150) HU to obtain the total abdominal muscle area. CT, computed tomography; HU, Hounsfield unit.

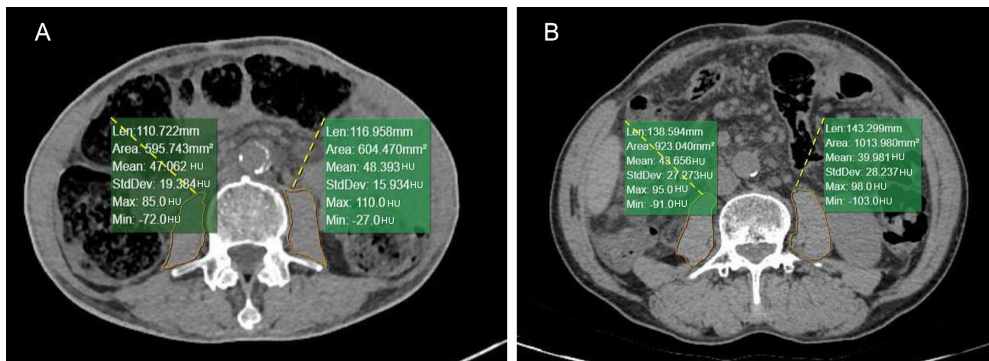


Figure S3 Area and density were measured by manually constructing polygon points around the outer margins of the psoas muscles. (A) A patient with a HUAC value of 47.73; (B) a patient with a HUAC value of 41.73. Len, length; StdDev, standard deviation; HU, Hounsfield unit; HUAC, Hounsfield unit average calculation.

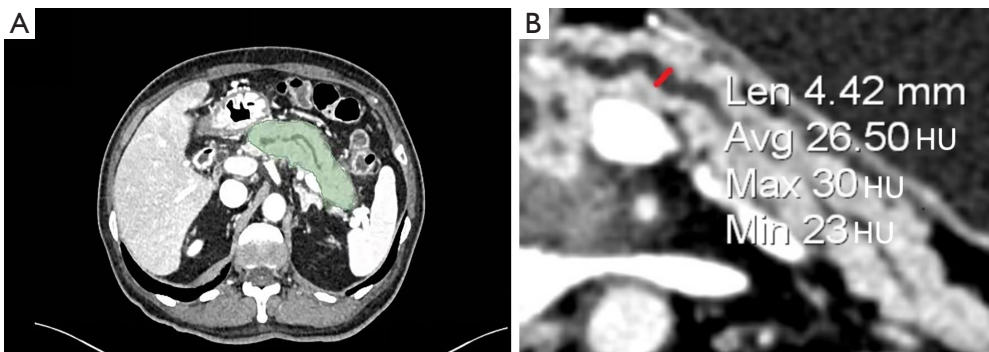


Figure S4 Segment the region of interest and measurement of pancreatic duct diameter. (A) Delineation of the body and tail of a patient's pancreas. (B) Measurement of the maximum diameter of the main pancreatic duct in a patient. The red line in (B) represents the schematic line segment for measuring the diameter of pancreatic duct. Len, length; Avg, average; HU, Hounsfield unit.

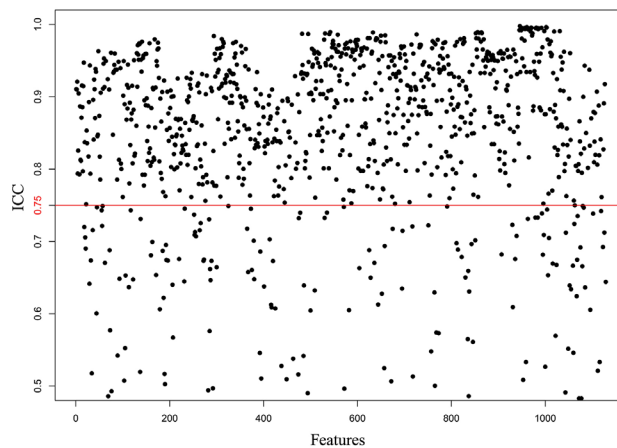


Figure S5 Evaluation of interobserver consistency of two segmented regions of interest using ICC. ICC, interclass correlation coefficient.

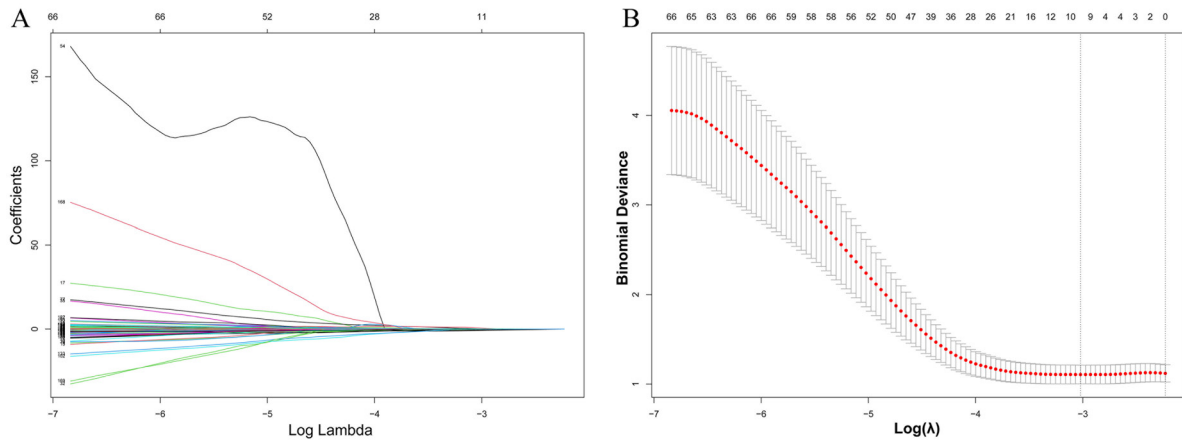


Figure S6 Radiomics features selection using the LASSO logistic regression. (A) The change of each variable coefficient with λ in LASSO-logistic regression; (B) determination of penalty parameter λ in LASSO-logistic regression. LASSO, least absolute shrinkage and selection operator.

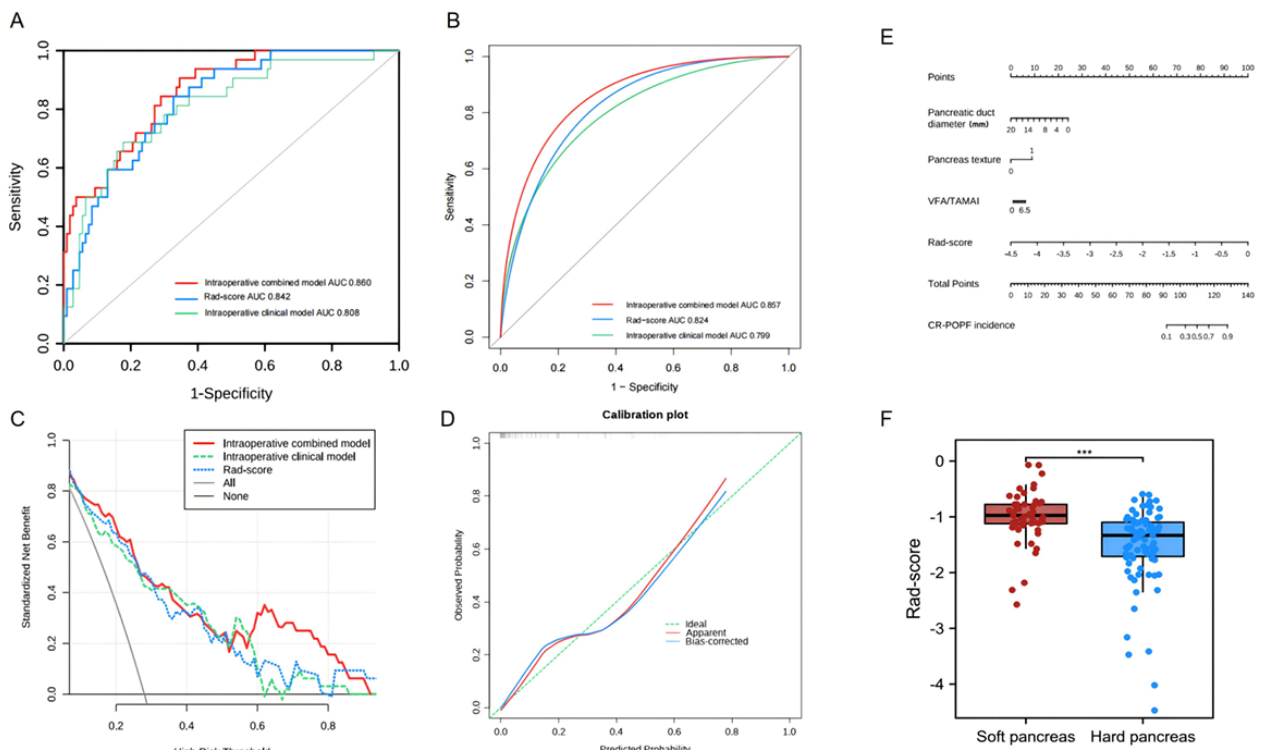


Figure S7 Efficacy evaluation and presentation of intraoperative prediction models. (A) Comparison of ROC curves of each model in the training set; (B) comparison of ROC curves of each model in 1,000 bootstrap resampling validation set; (C) comparison of decision curves for each model; (D) calibration curves for the intraoperative combined model; (E) nomogram of the intraoperative combined model predicting clinically relevant pancreatic fistula; (F) comparison of Rad-score between the soft pancreas group and the hard pancreas group. ***, $P < 0.001$. AUC, the area under the ROC curve; ROC, receiver operating characteristic; VFA/TAMAI, visceral fat area/total abdominal muscle area index; CR-POPF, clinically relevant postoperative pancreatic fistula; Rad, radiomics.