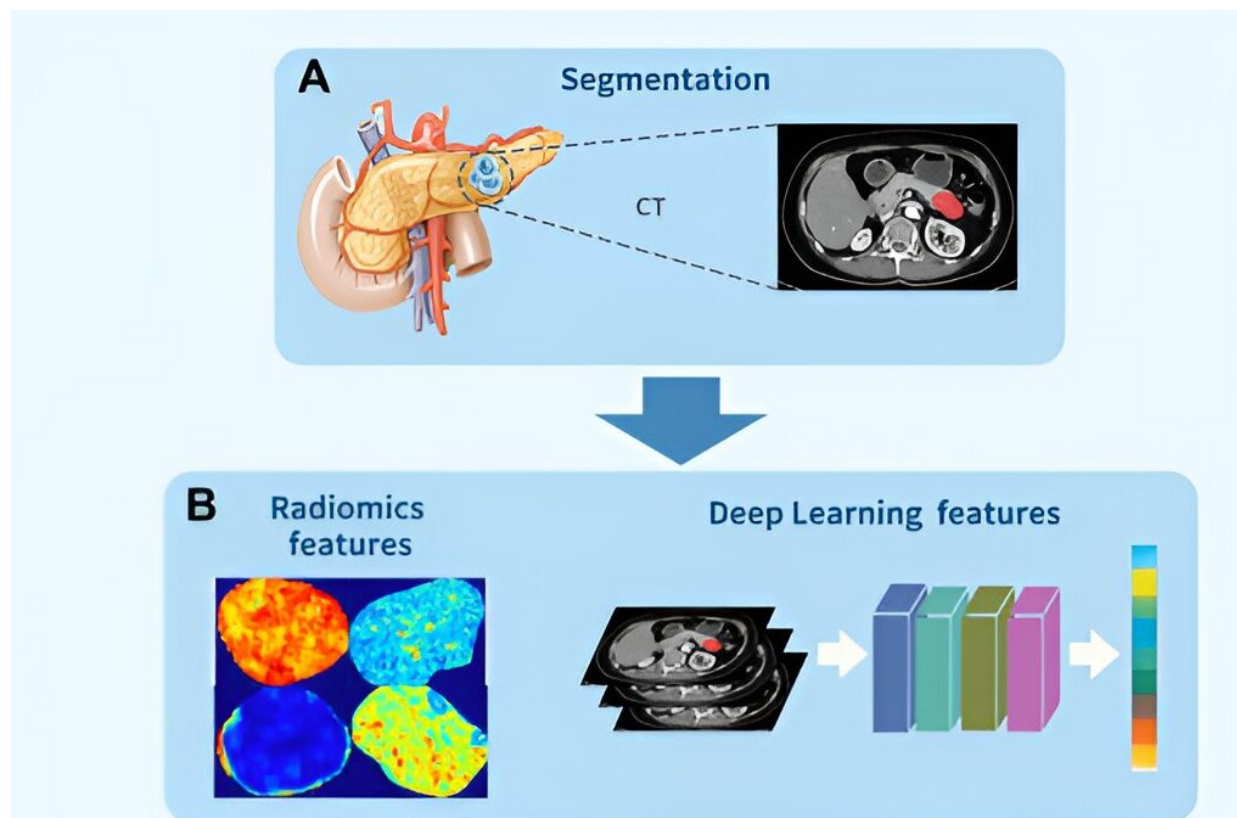


# CT-based radiomics deep learning to predict lymph node metastasis in tumors

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Schematic representation of the study's design and procedural steps. (A) Segmentation was conducted on atrial phase CT images. (B) Radiomics and deep learning features were extracted separately. (C) Feature selection was based on the U-test, ICC, and LASSO. (D) A radiomics deep learning signature (RDPs) was developed from the combined radiomics and deep learning scores. Credit: *eClinicalMedicine* (2023). DOI: 10.1016/j.eclinm.2023.102269

Researchers at University of Tsukuba have developed an imaging model to predict preoperative lymph node metastasis in nonfunctional pancreatic neuroendocrine tumors by combining radiomics (data analysis based on radiological images) and deep learning; this model has been developed as a new method for noninvasively determining preoperative lymph node metastasis. This new model enables more accurate diagnosis and selection of treatment strategies.

Nonfunctional pancreatic neuroendocrine tumors, while rare, are primarily treated through [surgery](#). The presence or absence of lymph node metastasis considerably influences the selection of surgical and other treatment approaches. Particularly controversial is the necessity of surgery for tumors smaller than 2cm as current clinical guidelines provide no clear consensus. Existing methods for preoperative diagnosis of lymph node metastasis are inadequate.

To address the aforementioned challenge, the Tsukuba team has created a [predictive model](#) by integrating radiomics features extracted from CT and MRI images using artificial intelligence deep-learning techniques. The findings are [published](#) in the journal *eClinicalMedicine*.

The model has demonstrated an 89% [success rate](#) in predicting lymph node metastasis, a rate that rises to 91% when the model is validated with data from an external hospital. Furthermore, the performance of the model remains consistent, irrespective of the tumor size being larger or smaller than 2cm.

In conclusion, the model can help predict lymph node metastasis. Moreover, the model equips [surgeons](#) with a crucial tool for selecting the most appropriate surgical procedures and treatment strategies, potentially transforming patient outcomes in the challenging medical field.

**More information:** Wenchao Gu et al, Development and validation of CT-based radiomics deep learning signatures to predict lymph node metastasis in non-functional pancreatic neuroendocrine tumors: a multicohort study, *eClinicalMedicine* (2023). [DOI: 10.1016/j.eclinm.2023.102269](https://doi.org/10.1016/j.eclinm.2023.102269)

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