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   2021Y002

2. Title
   Analysis of the relationship between recurrence of pancreatic neuroendocrine neoplasms and smoking based on machine learning techniques

3. Period
   2021-2023

4. Summary
   [Background] Although the prognosis of resected pancreatic neuroendocrine neoplasms (PanNENs) is generally considered to be good, a relatively high recurrence rate has been reported. Prognosis prediction is challenging in patients with PanNEN after curative resection. The aim of this study is to clarify the predictive factors for recurrence in patients with surgically resected PanNEN using AI models and to reveal the relationship between smoking and PanNEN.
   [Methods] We established a multicenter database of 573 patients with PanNENs, who underwent resection between January 1987 and July 2020 at 22 Japanese centers, mainly in the Kyushu region. We evaluated clinicopathological factors for resected PanNEN through Cox multivariate analyses and AI models (random survival forest; RSF).
   [Results] The smoking rate (current and past smoker) in patients with PanNEN was 32.1%. Prognosis of patients with smoking history was significantly unfavorable than that of patients without smoking (261 vs 222 months, p=0.009), however smoking did not affect the recurrence of PanNEN. The RSF model showed better predictive performance for recurrence of pancreatic neuroendocrine tumor (PanNET) G1/G2 than the Cox proportional hazards regression model. The Ki-67 index and tumor size were the predictors in the RSF model
   [Conclusions] We demonstrated the clinicopathological characteristics and predictive factors of recurrence in patients with PanNEN after curative resection. RSF model can be a useful tool that predict recurrence of PanNET. Further studies are required to clarify the relationship between smoking and PanNEN.