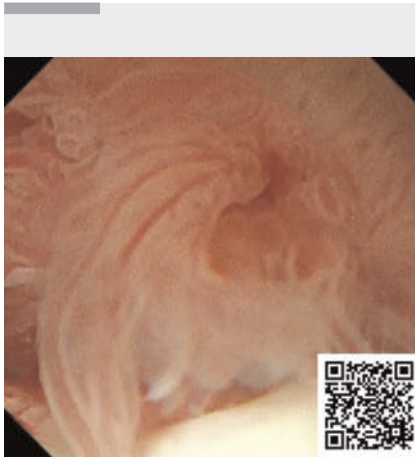
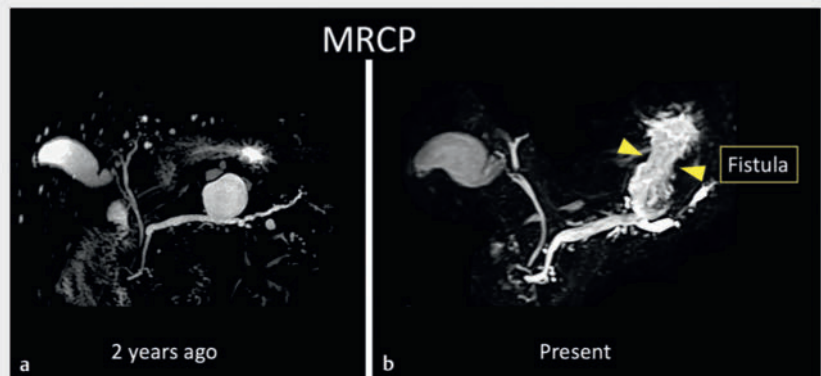


Into the pancreas: an underwater world filled with an intraductal papillary mucinous neoplasm seen via peroral pancreatoscopy

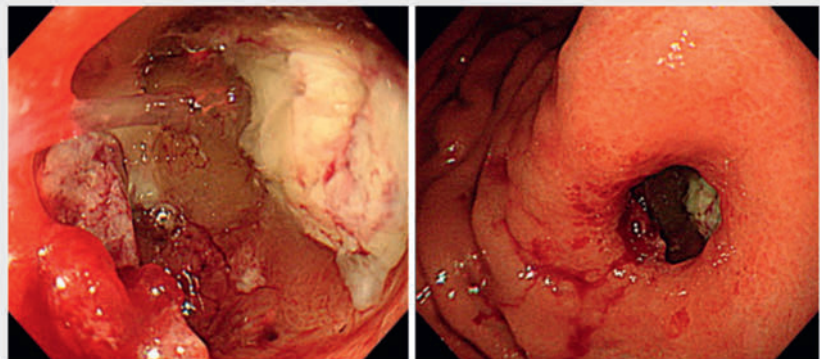
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▶ Video 1 An ultrathin endoscope with a transparent hood attached to the tip was used to perform peroral pancreatoscopy via a fistulous tract, yielding high quality intraductal pancreatic images, improved insertion, and a stable field of view. Source for the underwater photographs: ACworks Co. Ltd. Maho Ishikawa.



▶ Fig. 1 Images from magnetic resonance cholangiopancreatography of an elderly man with branch duct intraductal papillary mucinous neoplasm (BD-IPMN) performed: **a** 2 years previously; **b** during this presentation, with a fistula between the pancreatic duct branch and the stomach suspected.

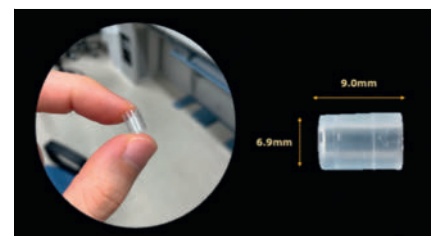


▶ Fig. 2 Images of the views obtained with a conventional endoscope (GIF-H290Z; Olympus, Tokyo, Japan).

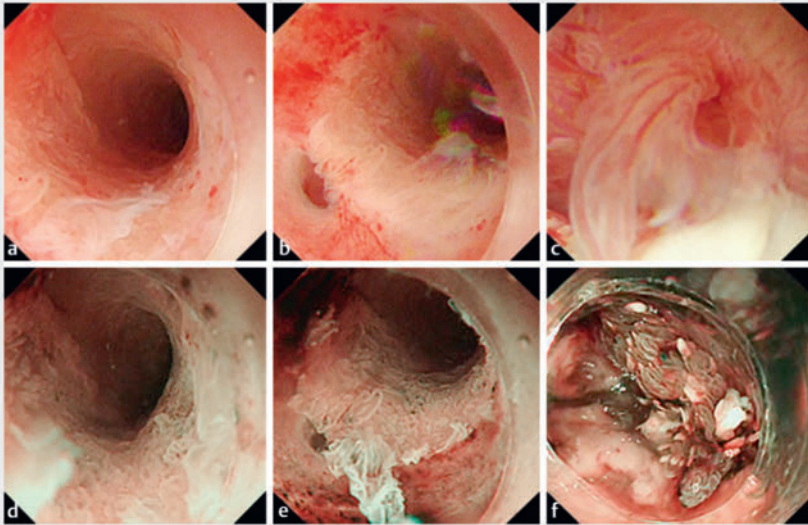
Although peroral pancreatoscopy (POPS) has been developed for detailed visualization of intraductal lesions, the images obtained are often inadequate because of the difficulty of insertion, the proximity of the pancreatoscope to the lesion, or visualization challenges due to mucus. Performance can be improved when it is combined with intraductal ultrasonography (IDUS) [1], narrow-band imaging (NBI) [2], and probe-based confocal laser endomicroscopy (pCLE) [3]; however, POPS alone has not achieved high quality intraductal imaging and is still under development.

Here, we report for the first time the use of an ultrathin endoscope with a transparent hood at the tip (Nichendo; Fujifilm Co., Tokyo, Japan) in POPS. This technique has been used in endoscopic submucosal dissection [4]; however, its use in the pancreaticobiliary region has not been reported.

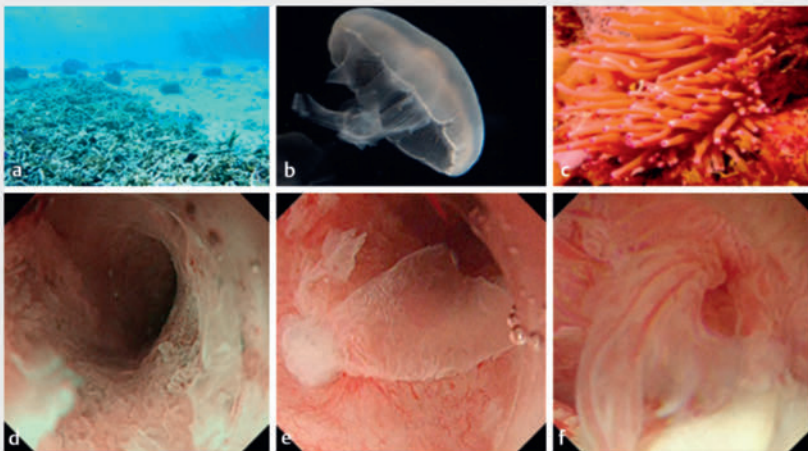
A man in his 80s underwent follow-up magnetic resonance cholangiopancreatography (MRCP) for a branch duct intraductal papillary mucinous neoplasm (BD-IPMN); a fistula between the pancreatic duct branch and the stomach was suspected, with gastric perforation of the BD-IPMN (**▶ Fig. 1**). To obtain a definitive diagnosis, we initially attempted visualization with a conventional endoscope (GIF-H290Z; Olympus, Tokyo, Japan); however, insertion was difficult (**▶ Fig. 2**). Therefore, an ultrathin endo-



▶ Fig. 3 Photograph of the transparent hood (Nichendo; Fujifilm Co., Tokyo, Japan), which has an outer diameter of 6.9 mm and a length of 9 mm and creates a clear and direct perspective.



► **Fig. 4** Characteristic mucosal appearances seen on: **a–c** white-light endoscopy; **d–f** narrow-band imaging for areas with: **a, d** low grade mucosal changes; **b, e** high grade changes; **c, f** invasive carcinoma.



► **Fig. 5** Mucosal images on peroral pancreatoscopy, along with their underwater likenesses, showing: **a, d** the bleached coral-like appearance of low, rough mucosa inside the pancreatic duct; **b, e** the jellyfish-like appearance of fragile mucosa floating at the entrance of the pancreatic duct; **c, f** the sea anemone-like appearance of a tall, highly atypical mucosa near the gastrostomy. Source for Figure 5 **a** and **c**: ACworks Co. Ltd. Maho Ishikawa.

scope (GIF-XP260N; Olympus) with a transparent hood was used (► **Fig. 3**, ► **Video 1**).

This method enabled visualization of the pancreatic duct and its branches. White-light endoscopy (WLE) and NBI allowed

visualization of the mucosa with high quality images and suggested a relationship between the mucosal appearance and atypical tissue (► **Fig. 4**). Characteristic findings including a “bleached coral-like appearance”, indicating rough

mucosa, “jellyfish-like appearance” at the entrance of the pancreatic branch duct, and “anemone-like appearance” near the gastrostomy were seen (► **Fig. 5**).

This is the first report of an ultrathin endoscope with a transparent hood being used for POPS, providing high quality intraductal pancreatic images, improved insertion, and a stable field of view.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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