

A calibrated, small-caliber tip, transparent hood to aid endoscopic balloon dilation of intestinal strictures in Crohn's disease: successful use of prototype

Endoscopic balloon dilation (EBD) has become a standard minimally-invasive therapy for Crohn's disease-related small-intestinal strictures [1]. However, the strictures are usually accompanied by inflammatory changes, which can hinder the passage of the balloon catheter through the strictures. Moreover, often several strictures are present that can require multiple consecutive dilations in a single procedure. Because accurate measurement of the stricture diameter is essential to the selection of the correct size of balloon catheter, we devised a prototype calibrated, small-caliber tip, transparent (CAST) hood to overcome this difficulty (● Fig. 1a).

The CAST hood is designed to fit the tip of a therapeutic-type double-balloon endoscope (DBE; EN450-T5; Fujifilm, Tokyo, Japan). The hood has a tapered shape with calibration lines marked along its side (● Fig. 1b). Once the tip of the DBE

reaches a stricture, we align the inner ring of the CAST hood with the orifice of the stricture. The diameter of the stricture is measured by pressing the CAST hood into the stricture, so that the measurement can be read from the calibration lines (● Fig. 2). A guidewire and an appropriate-sized balloon catheter are then inserted (● Fig. 3). The endoscope with the CAST hood is then simply advanced through the stricture, like a bougie, and subsequent strictures are managed in the same fashion.

Between April 2009 and March 2011, the CAST hood was prospectively evaluated in 19 patients with Crohn's disease-related intestinal strictures. All of the patients had more than one stricture and multiple EBDs were successfully performed with the CAST hood. The maximum number of EBDs performed in a single procedure was 10. By comparing the diameter of the impression ring to the calibration lines, we were able to precisely measure the stricture sizes.

The CAST hood can facilitate consecutive EBDs of intestinal strictures in Crohn's disease. Accurate measurement of the stricture diameter using the CAST hood is safe and helpful for selection of the correct size of balloon catheter for EBD.

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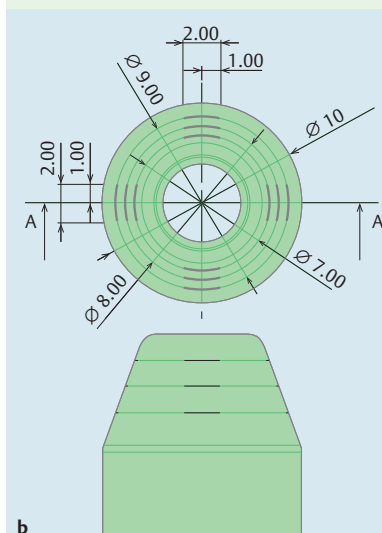


Fig. 1 The prototype calibrated, small-caliber tip, transparent (CAST) hood, which is made of polycarbonate showing: **a** the tapered tip, good transparency, a thin-walled basal cylinder, and clear calibration lines; **b** detailed diagrams of the hood design.

Competing interests: Yoshikazu Hayashi has applied for a patent in Japan for the CAST hood described in the article. Hironori Yamamoto has patents in Japan for the double-balloon endoscopy system described in this article.

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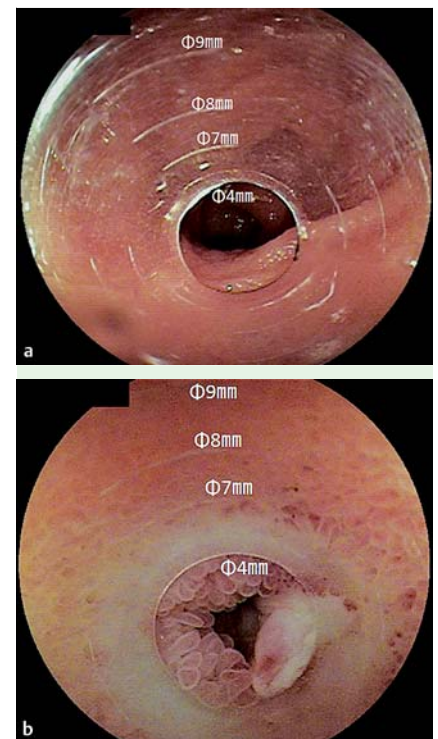


Fig. 2 Endoscopic views showing: **a** the calibrated, small-caliber tip, transparent (CAST) hood and the clear calibration lines (7–9 mm) for measurement of the inner diameter of a stricture; **b** the CAST hood being pressed against the stricture, with the inner circle of the hood aligned with the orifice of the stricture. The inner diameter of the stricture is measured from the impression ring on the surface of the CAST hood with reference to the calibration lines.

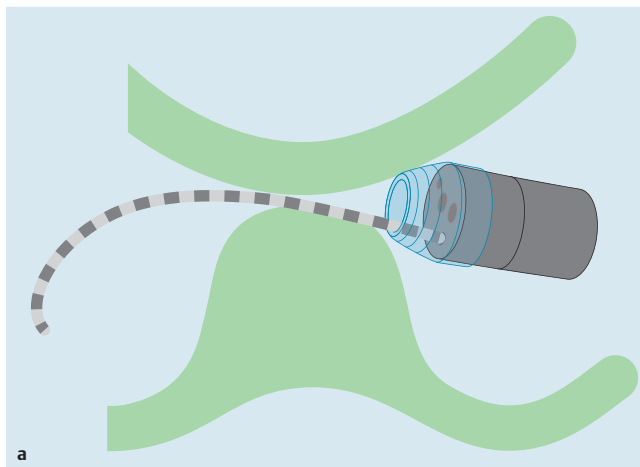
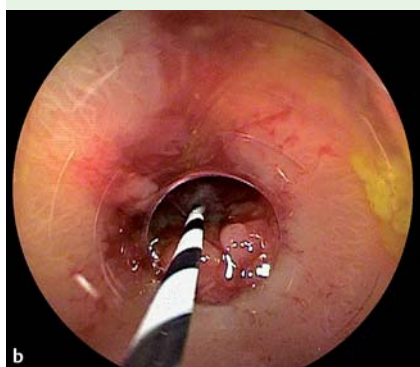


Fig. 3 Use of the calibrated, small-caliber tip, transparent (CAST) hood allows a guidewire to be passed easily into the stricture in a straight line: **a** schematic of guidewire delivery; **b** endoscopic view of a guidewire in position.



References

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Bibliography

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