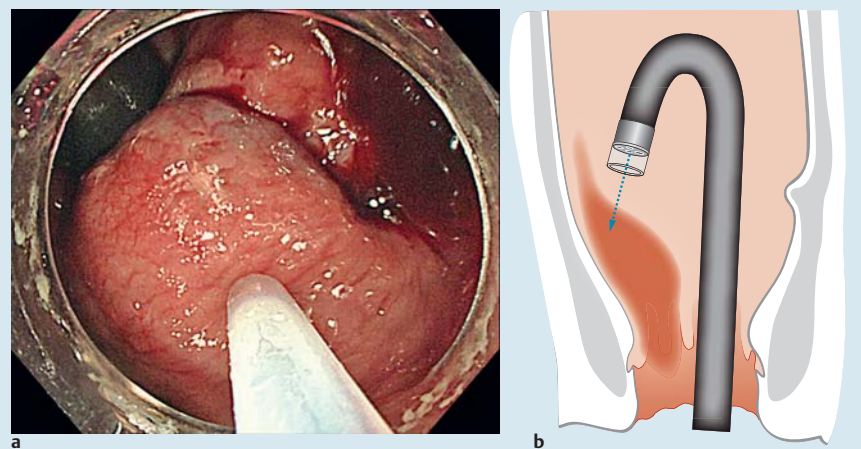
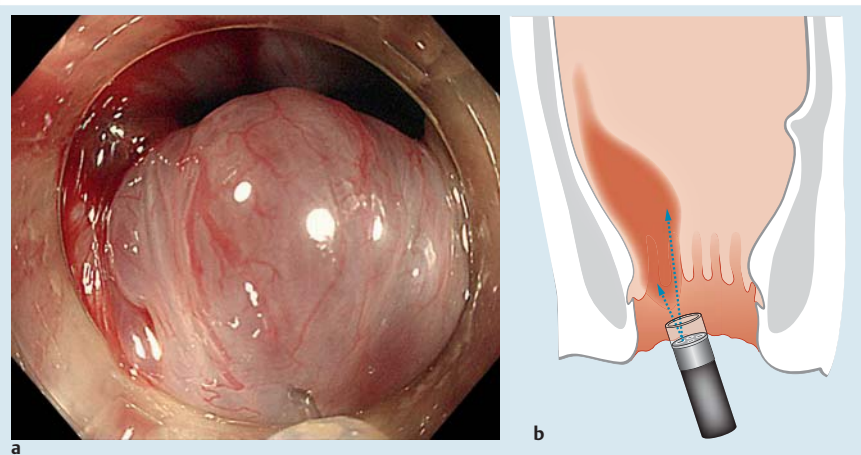


## Endoscopic sclerotherapy with aluminum potassium sulfate and tannic acid for internal hemorrhoids



**Fig. 1** a Injection of aluminum potassium sulfate and tannic acid (ALTA) into the upper parts of the target swollen internal hemorrhoid. b Schema of ALTA injection with retroflexion of the endoscope as the first step.



**Fig. 2** a Injection of aluminum potassium sulfate and tannic acid (ALTA) into the middle and lower parts of the target swollen internal hemorrhoid. b Schema of ALTA injection with the endoscope in the normal position for the second, third, and fourth steps.

Sclerotherapy with injection of aluminum potassium sulfate and tannic acid (ALTA) has been reported to be a new, valid treatment method for internal hemorrhoids that does not involve resection [1,2]. With this method, ALTA is injected into the submucosa at the base of hemorrhoids by performing direct four-step injection (involving the upper, deep middle, shallow middle, and lower parts of the hemorrhoids) using an anoscope. We considered the possibility of using endoscopic injection instead of an anoscope in ALTA sclerotherapy.

Anesthesia was not induced in the periphery of the anus. A transparent hood was attached to the tip of the scope. As the first step, the scope was inserted and retroflexed in the rectum to inject 2 mL ALTA into the upper parts of the target swollen internal hemorrhoid (● Fig. 1). Subsequently, after the scope was placed in a normal position, ALTA was injected into the deep middle, shallow middle, and lower parts as the second, third, and fourth steps, respectively (● Fig. 2). After ALTA had been injected into all internal hemorrhoids, the endoscope was removed and the injected sites were mas-

saged with the index finger to promote the diffusion of ALTA throughout the rectal area, to prevent the formation of rectal ulcers by local stagnation of the ALTA solution in the hemorrhoids.

The merits of using endoscopy in ALTA sclerotherapy include: not requiring anesthesia; preventing the injection needle from entering layers deeper than the submucosa; and enabling therapists to confirm that the drug has been appropriately injected into the submucosa with a monitor. While acute, thrombosed, strangulated, and external hemorrhoids should not be treated using ALTA, the use of endoscopy, rather than anoscopy, in the direct four-step injection procedure in ALTA sclerotherapy may bring additional benefit for treating internal hemorrhoids, since the endoscopic procedure provides safer and more accurate ALTA injection.

Endoscopy\_UCTN\_Code\_TTT\_1AS\_2AZ

**Competing interests:** None

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