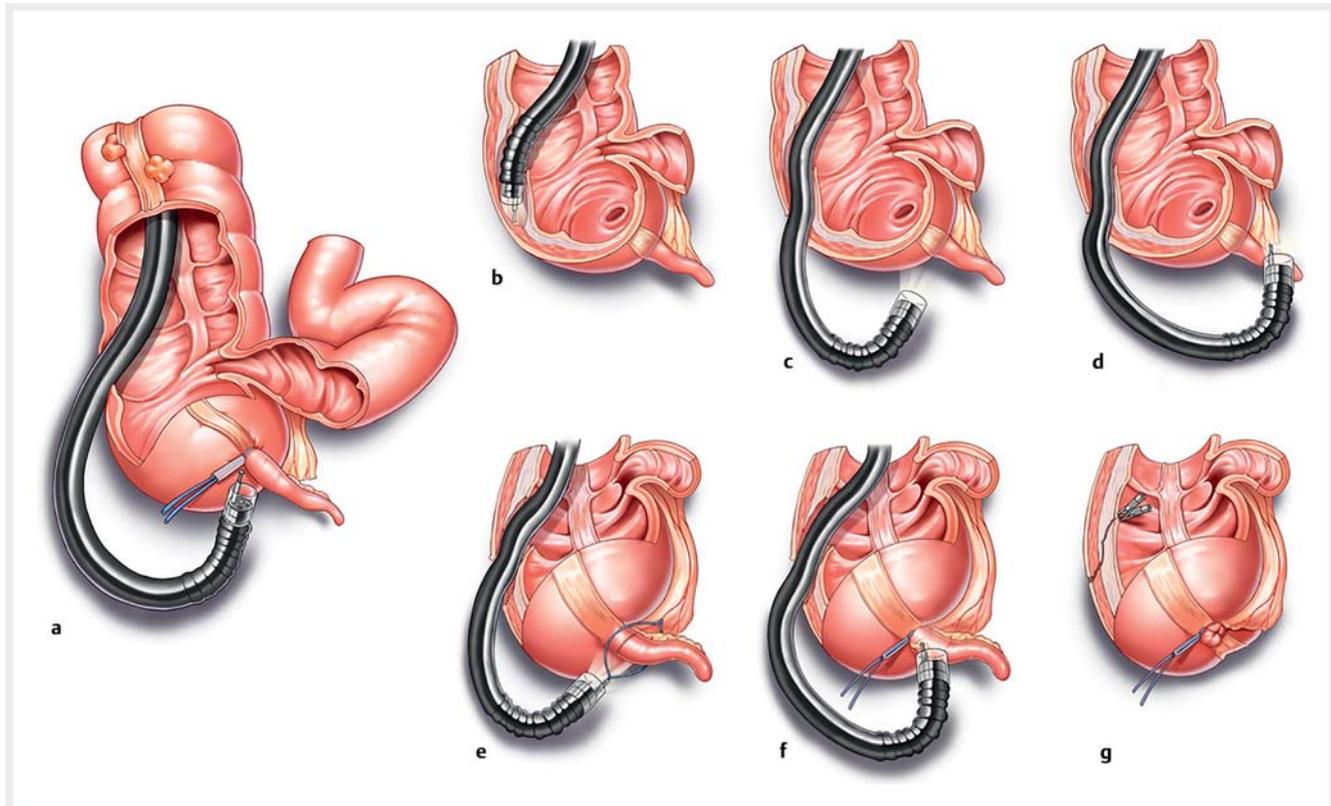
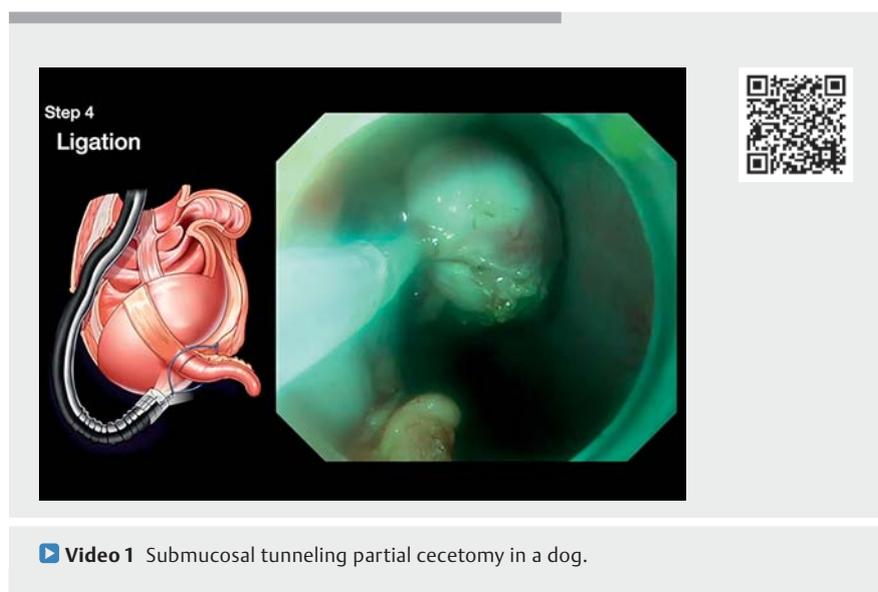


## Submucosal tunneling cecetomy in a dog: is it applicable for appendectomy in human?



**Fig. 1** Submucosal tunneling appendectomy **a** Overview. **b** Mucosal incision. **c** Submucosal tunneling. **d** Dissection of the appendix. **e** Ligation of the appendix. **f** Resection of the appendix. **g** Retrieval and mucosal closure.

We hereby present the successful application of submucosal tunneling cecetomy on a 12-kg female Beagle dog to mimic appendectomy in human. The steps were as follows (► **Fig. 1**, ► **Video 1**). Step 1: mucosal incision – the colonic cavity was intensively washed with normal saline to avoid leakage of fecal contents; the mucosa opposite the ileocecal valve was chosen for mucosal incision; a 2-cm horizontal or oblique mucosal incision was created. Step 2: submucosal tunneling – a submucosal tunnel was created until intentional perforation of the muscularis propria, about 3 cm from the appendix; the distance of 3 cm provided critical working space and better visualization of the appendix. Step 3: dissection



► **Video 1** Submucosal tunneling partial cecetomy in a dog.

of the appendix – the appendix was then dissected from the mesoappendix with electrocoagulation of mesentery vessels. Step 4: ligation of the appendix – the bottom of the appendix was ligated with an endoloop. Step 5: resection of the appendix – the appendix was resected using a snare; to prevent leakage, the stump was then secured with another endoloop. Step 6: retrieval and mucosal closure – the appendix was retrieved by a snare; after careful hemostasis, the mucosal incision site was closed using hemostatic clips. The procedure took 50 minutes, and the dog was sacrificed after the operation.

This novel technique combines elements from submucosal tunneling endoscopic resection (STER) [1, 2] and endoscopic intraperitoneal subserosal dissection (EISD) [3], leading to clear advantages over direct resection of the appendix from the colonic cavity [4] through a full-thickness transcolonic route. The mucosal barrier in the STER technique decreases the risk of suture failure and related complications, while the distance from perforation to the appendix leads to direct view and decreased mobility of the appendix during dissection from the mesoappendix. With accumulated experience, this technique may be further expanded for appendectomy and other natural orifice transluminal endoscopic surgeries in human.

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## Competing interests

The authors declare that they have no conflict of interest.

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