



**Supplementary Fig. 5.** (A, B) Representative endoscopic images of pouch fistula. A fistula developed in the distal pouch body (arrowheads show a fistula). (C, D) The proximal pouch body showed many focal ulcerations. (E) Corresponding biopsy demonstrates 15.8% of goblet cells were positive for high-iron diamine (scale bar = 200  $\mu$ m).