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Mucosal loss is the critical mechanism of esophageal stricture after mucosal resection: A pilot experiment in a porcine model

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Background & Aim: Esophageal stricture is a major complication of large area Endoscopic Mucosal Resection (EMR) or Endoscopic Sub-mucosal Dissection (ESD). To date, the critical mechanism of esophageal stricture has not been fully elucidated. Here, we designed this experiment to explore the role of mucosal loss in esophageal stricture after mucosal resection in a porcine model.

Material & Methods: 12 swine were randomly divided into two groups. Firstly, in all the swine, two sub-mucosal tunnels were made of 5 cm in length and 1/3rd in width on the anterior and posterior wall of the esophageal circumference. After that, the covered mucosa was resected along the lateral edges of the tunnel in the group 1. Meanwhile covered mucosa was incised on the midline of the tunnels in the group 2. The process of stricture formation was evaluated by endoscopy after one, two and four weeks, respectively. Anatomical and histological examinations were performed after euthanasia.

Result: Ulcer formation was observed on endoscopy after one week. Group 1 (mucosa resected) developed mild to severe esophageal stricture with dysphagia and weight loss, whereas no esophageal stricture was evident in the ones of group 2 (mucosa incised) after two and four weeks, respectively. Macroscopic appearance showed severe esophageal stricture and shortening of esophagus in the group 1 while no evident esophageal stricture and shortened esophagus was found in the group 2. Inflammations and fibrous hyperplasia of sub-mucosal layer was observed in both groups, on histological examination.

Conclusion: The loss of esophageal mucosa might be the crucial factor for esophageal stricture after mucosal resection. Fibrosis followed by inflammation may slightly attribute toward esophageal stricture formation but is not the main mechanism of post-resection stricture. These results have significance for developing a suitable treatment for esophageal stricture.

Biography

Saif Ullah has received his Bachelors from the School of Medicine of Zhengzhou University, China. He is currently pursuing MD under kind supervision of Prof. Bingrong Liu, President of GI Hospital, The First Affiliated Hospital of Zhengzhou University, China. He has been carrying out series of animal experiments and clinical research in the endoscopic procedures related to NOTES under the supervision of Prof. Bingrong Liu.

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