Endoscopic Radiofrequency ablation for early esophageal squamous neoplasia

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Recent advances in image-enhanced endoscopy have enabled an early accurate diagnosis of esophageal squamous neoplasia (ESCN). For the treatment of early ESCNs, endoscopic submucosal dissection (ESD) enables en bloc resection of the neoplasia, and the resected specimen allows for a pathological assessment to evaluate the curability. However, ESD is a complicated procedure that requires a high level of expertise, especially for large lesions. In addition, a long learning period is required to successfully perform ESD, and therefore this procedure can only be performed in high capacity institutes. In addition, esophageal strictures have been reported to complicate more than 90% of cases of esophageal ESD involving the entire lumen circumference. The resultant dysphagia substantially decreases the patients' quality of life, requiring multiple sessions of endoscopic dilatation.

Radiofrequency ablation (RFA) is a rapidly evolving therapeutic modality, and recent studies have shown its efficacy and safety for eradicating dysplasia in cases of Barrett's esophagus. RFA also has theoretical potential for treating squamous epithelial neoplasias. However, only a few studies have demonstrated the potential efficacy for squamous neoplasia, and no studies have compared its efficacy and safety with ESD. Whether RFA can be an alternative to ESD for the treatment of ESCN is still uncertain.

Here, we will report our experiences related to these two modalities in treating early ESCNs at EDa Hospital in Taiwan. We consecutively enrolled patients with flat-type "large" (length ≥3cm extending ≥1/2 of the circumference of esophagus) early ESCNs treated endoscopically. The main outcome measurements were complete response at 12 months, and adverse events. Of a total of 65 patients, 18 were treated with RFA and 47 with ESD. The procedure time of RFA was significantly shorter than that of ESD (126.6 vs. 34.8minutes; $p<0.001$). The complete resection rate of ESD and complete response rate after primary RFA were 89.3% and 77.8%, respectively. After additional therapy for residual lesions, 46 (97.9%) patients in the ESD group and 17 (94.4%) patients in the RFA group achieved a complete response at 12 months. Four patients (8.5%) developed major procedure-related adverse events in the ESD group, but none in the RFA group. In patients with lesions occupying more than 3/4 of the circumference, a significantly higher risk of esophageal stenosis was noted in the ESD group compared to RFA group (83% vs. 27%, $p=0.01$) which required more sessions of dilatation to resolve the symptoms (median, 13 vs. 3, $p=0.04$). There were no procedure-related mortality or neoplastic progression in either group. These data indicate RFA and ESD are equally effective in the short-term treatment of early flat large ESCNs, however more adverse events occur with ESD, especially in lesions extending more than 3/4 of the circumference.

Nevertheless, RFA is a tissue-destructive treatment modality, and does not allow for pathology to evaluate the curability after ablation. This is a major concern, and thus the use for SCC should be conservative. The risk of incomplete ablation and recurrence of ESCNs after treatment reiterates the need for strict patient selection and continuing endoscopic surveillance.