

Criteria to Characterize Polypoid Nodule Scar after Gastric Endoscopic Submucosal Dissection in Order to Differentiate It from Tumor Recurrence

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Dear Editor,

We read with great interest the study published in this journal by Cha and Jang,¹ addressing the healing process of gastric scar after endoscopic submucosal dissection (ESD) and its correlation with tumor recurrence. The authors analyzed 141 patients who underwent endoscopic resection of gastric neoplasms, by ESD or endoscopic mucosal resection (EMR), and divided the post-resection ulcer healing process into three types: scar, hypertrophic polypoid, and nodular. Tumor recurrence was identified in eight patients (5.7% of entire population), and five of them presented a nodular type scar. They concluded that nodular type scar was associated with tumor recurrence.

For many years our group has been studying the healing process of ESD defect after gastric ESD. After successful ESD (en bloc R0 resection), we expect to find a whitish and homogeneous scar, frequently with fold convergence. Interestingly, we observed that some patients who undergo ESD most likely for antral neoplasms, despite curative R0 resection, develop anomalous scars with protruded, and polypoid tissue growth. In 2016, we first described this entity in the literature and named this condition as polypoid nodule scar (PNS).² In this same period, we performed a retrospective investigation to assess the occurrence of PNS in two tertiary hospitals.³ A total of 14 PNS cases among 403 patients who underwent gastric ESD (3.47%) were noted. Biopsies taken from the nodular scars revealed regenerative and hyperplastic tissue, without dysplasia or neoplastic cells. All PNS cases were noted after the removal of tumors originally located in the distal stomach. These patients were followed annually and no tumor recurrence was identified

(mean follow up: 45 months). We concluded that PNS was a benign condition, related to an anomalous over-regeneration of epithelium that occurs in the antrum for unknown reasons and could be managed conservatively as long as the following criteria were respected: (i) successful *en bloc* ESD with R0 and curative resection confirmed histologically; (ii) postoperative endoscopy with the identification of PNS at ESD scar; (iii) multiple forceps biopsies taken from the protruded scar demonstrating hyperplastic or regenerative tissue, reviewed by an experienced gastrointestinal pathologist.³ The reason why we have defined this specific condition of post-ESD/EMR scar as PNS was because it obviates any clinical concern and interventions for recurrence when we find this endoscopic appearance in the scar. After these studies, we have conducted a large multicenter study to validate the occurrence and clinical relevance of PNS, with the participation of 5 high-volume ESD centers.⁴ We adopted the same criteria to identify PNS patients.⁴ We were able to identify 2275 patients who were submitted to ESD with follow-up control. In this population, we encountered 28 patients (18 male/10 female) who developed PNS, with an overall incidence of 1.2%. Similarly, all individuals with PNS had tumors located in the distal stomach. When we extracted only lesions located in the antrum ($n = 912$), the PNS incidence rate reached 3.1%. No recurrent tumors were noted in the PNS scar after an average follow-up of 43 months (range 6-192). The protruded scar eventually disappeared over time in 5 individuals (17.8%). Thus, we concluded that PNS may occur after ESD in the distal stomach in approximately 3.0%, and although its appearance looks concerning, if all criteria utilized to characterize PNS are present (R0 and curative resection with multiple biopsies negative for tumor

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cells), tumor recurrence appears to be highly unlikely and PNS may be managed conservatively.

Recently, Kim et al. reported a large series of 2096 cases that underwent gastric ESD and a PNS was noted in 48 patients (2.3% incidence) with biopsies showing foveolar epithelium.⁵ The authors reported that only one case of polypoid type scar among the 48 patients developed recurrent tumor (2.08%), whereas the local recurrence rate was similar to that of flat type scar (36/1709 = 2.11%), suggesting that polypoid or flat macroscopic appearance was not associated with tumor recurrence. Therefore, we would like to respectfully suggest to Cha and Jang to review their cases of recurrence if all criteria needed to characterize PNS were followed. Especially, because R0 and curative resection rate of initial EMR/ESD were not documented in their manuscript, recurrent cases cannot be characterized as PNS that developed tumor recurrence but may correspond to residual tumor usually associated with incomplete or piece-meal resection or positive/unclear margins compromise.

MAIN POINTS

- Polypoid nodule scar (PNS) is an anomalous and protruded scar that may occur after ESD for neoplasms located in the distal stomach.
- The characterization of PNS requires objective criteria that need to be clearly documented, such as R0 and curative resection and biopsies of the protruded scar demonstrating hyperplastic or regenerative tissue.
- PNS should be differentiated carefully from residual tumor or recurrence, because PNS management is conservative and does not require endoscopic resection or salvage surgery.

One final comment about the division of healing types of gastric ESD into three categories (scar, hypertrophic polypoid, and nodular), as proposed by Cha and Jang, seems to confuse readers. In our view, and in agreement with Kim et al.'s proposition,⁵ the scar after gastric ESD is better to be simply divided into two types: scar type with flat and regular mucosal appearance and PNS with protrusion.

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