malignancy, and surgical resection is the gold standard for treatment of these tumors. On the other hand, small GISTs (< 3 cm in diameter) are usually benign and there is no consensus about treatment recommendations for such tumors; surgery or observation with regular follow-up.

In several recent studies, laparoscopic or endoscopic resection has emerged as minimally invasive treatment for small GISTs of the stomach. However, most of these studies have been in single or a small number of cases, and the safety and efficacy of these novel treatments has not been established.

In this brief communication, we report the results of endoscopic enucleation of GISTs of the stomach in five patients. Endoscopic enucleation appears to be a safe and effective method of treatment of small GISTs of the stomach, if the tumor tissue does not adhere to the muscularis propria.

CASE REPORT

The patients were three men and two woman, aged 36-56 years. Tumors located in the cardia were completely enucleated endoscopically without any serious complication. The largest diameter of removed tumors ranged from 1.2 to 2.5 cm. Histopathological diagnosis was GIST with low risk of malignancy (mitotic index < 5/50 high power field) in all cases. The patients were disease-free for 10.5-42.2 mo after endoscopic enucleation.

INTRODUCTION

Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal subepithelial tumors of the gastrointestinal tract. Immunohistochemical studies have indicated their relationship to the interstitial cells of Cajal, with which they share differentiation markers such as CD-117 (c-kit) and CD34. They are tumors with uncertain malignant potential, the risk of which is predicted by tumor size and mitotic index.

Large GISTs of the stomach carry a high risk of malignancy, and surgical resection is the gold standard for treatment of these tumors. On the other hand, small GISTs (< 3 cm in diameter) are usually benign and there is no consensus about treatment recommendations for such tumors; surgery or observation with regular follow-up. In several recent studies, laparoscopic or endoscopic resection has emerged as minimally invasive treatment for small GISTs of the stomach. However, most of these studies have been in single or a small number of cases, and the safety and efficacy of these novel treatments has not been established.

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Endoscopic enucleation of gastrointestinal stromal tumors of the stomach: Report of five cases

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Key words: Gastrointestinal stromal tumor; Endoscopic enucleation; Stomach

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Abstract

Gastrointestinal stromal tumor (GIST) of the stomach was treated by endoscopic enucleation in five patients. They were three men and two woman, aged 36-56 years. Tumors located in the cardia were completely enucleated endoscopically without any serious complication. The largest diameter of removed tumors ranged from 1.2 to 2.5 cm. Histopathological diagnosis was GIST with low risk of malignancy (mitotic index < 5/50 high power field) in all cases. The patients were disease-free for 10.5-42.2 mo after endoscopic enucleation.

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GISTs with low risk for malignancy (mitotic index, < 5 per 50 high power field) in all of the patients. The patients were disease-free at 10.5-42.5 mo (median, 26.6 mo) after the operation.

**DISCUSSION**

Reports on endoscopic removal of small GISTs of the stomach have been increasing, but they are mostly documentation of single or a small number of cases[2,5,6]. Park et al[7] have recently reported the experience of endoscopic enucleation of submucosal tumors of the esophagus and the stomach in 15 patients. There were four patients with GISTs of the stomach. Tumor tissue was removed completely in these patients but a small perforation occurred in one patient, in whom the tumor involved the muscularis propria and had grown outward to the serosa. Roesch et al[8] have treated 14 patients with submucosal tumors of the esophagus and the stomach by endoscopic surgery. In their series, there were five patients with GIST of the stomach. No serious complications were encountered in these patients but complete removal was uncertain in two patients with gastric GISTs that originated in the muscularis propria.

These reports, together with our experiences reported here, indicate endoscopic enucleation is a safe and effective method of treatment for most patients with gastric GISTs. Endoscopic enucleation, however, is not indicated if the tumor is > 3 cm in diameter or if involvement of the muscularis propria is suspected from preoperative ultrasonography.

If GIST is completely removed by endoscopic resection and histopathological examination discloses that the risk for malignancy is low, then no further treatment is necessary. However, if resection is incomplete and/or the tumor tissue has a high risk of malignancy, additional wide resection is indicated. At present, whether postoperative imatinib can improve disease-free survival in high-risk patients is still uncertain[9].

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**Figure 1** Endoscopic appearance of a subepithelial tumor in the cardia of the stomach.

**Figure 2** Ultrasonography indicated the tumor was confined within the submucosa.

**Figure 3** A: Dissection of submucosal tumor after removing the covering mucosa; B: Snaring of the base of the tumor; C: Specimens of the enucleated tumor and its covering mucosa.
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