

## EUS-guided endoscopic resection using band ligation of oesophageal granular cell tumour : Report of a case

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### Abstract

A 60-year-old Japanese man was referred for treatment of a polypoid oesophageal tumour. Radiographic examination of the upper gastrointestinal tract disclosed a nodule with central depression in the lower esophagus. By endoscopy the nodule was yellowish and appeared submucosal. Endoscopic ultrasonography demonstrated a hypoechoic solid tumour limited in submucosa without lymph node involvement. Endoscopic resection using band ligation was performed under guidance by endoscopic ultrasonography. By histologic examination the tumour consisted of large cells arranged in nests. These cells had abundant granular cytoplasm and small round nuclei. They expressed S-100 protein and were CD68, and periodic acid-Schiff positive. No expression of  $\alpha$ -smooth muscle actin was noted. The tumour was limited in submucosa. Findings were consistent with complete endoscopic resection. This report may be the first concerning an oesophageal granular cell tumour successfully treated with EUS-guided endoscopic resection using band ligation. (*Acta gastroenterol. belg.*, 2005, 68, 272-275).

**Key words :** oesophagus, granular cell tumour, endoscopic ultrasonography, endoscopic resection, band ligation.

### Introduction

Granular cell tumours (GCT) are rare neoplasms, most often found in the tongue, oral cavity, skin, and breast ; however, GCT involve the gastrointestinal tract in 1% to 8% of cases (1,2). The esophagus is the gastrointestinal site most frequently affected ; such tumours are rarely seen in the stomach, colon, or rectum (3). Since 1931, about 200 oesophageal GCT cases have been reported (3,4). Most of these lesions are benign ; only 3% are malignant (5). Until recently, management consisted of 2 relatively unsatisfactory options : observation without a definitive tissue diagnosis, and surgical resection (6). Two important technical advances in endoscopy during the last decade, EUS and endoscopic resection, can greatly improve management of submucosal tumours of the gastrointestinal tract (6-9). We report a granular cell tumour that was removed completely by EUS-guided endoscopic resection using band ligation. Information obtained by an endoscopically guided ultrasonic probe was useful for planning treatment of this oesophageal GCT and for preventing complications associated with endoscopic resection.

### Case presentation

A 60-year-old Japanese man was referred to our hospital for further evaluation and treatment of a polypoid

oesophageal lesion. On admission the patient had no specific complaints. Physical examination showed no abnormalities. Complete blood count and serum chemistry screening results were within normal limits.

An upper gastrointestinal radiographic contrast examination disclosed a small polypoid lesion 8 mm in diameter with a central depression in the lower esophagus (Figure 1). Oesogastroduodenoscopy (Figure 2A) demonstrated a white to yellowish submucosal tumour with a central depression. This mass was covered with normal-appearing mucosa, resembling a molar tooth in contour. Endoscopic ultrasonography (EUS) using a 15-MHz ultrasound catheter probe (Figure 2B) revealed a homogeneous hypoechoic mass in the submucosa without lymph node involvement. This mass had a clear border and a smooth margin. These findings were compatible with a granular cell tumour, and the lesion was judged to be safely resectable endoscopically.

EUS-guided endoscopic resection using band ligation was performed as follows. First, a heater-probe was used to define the margins of the lesion. About 5 ml of concentrated glycerin solution mixed with small amounts of epinephrine solution and indigo carmine dye was injected into the submucosal layer beneath the target lesion to separate the lesion from underlying tissues, thus reducing risk of perforation and of deep residual tumour. Sufficient separation of the margin of the hypoechoic mass from the underlying muscularis propria layer then was confirmed using EUS (Figure 3A). The distance from the margin of the lesion to the muscularis propria was favorable (about 10 mm). The lesion then was aspirated into the ligator device (MD-48710 EVL Device ; Sumitomo Bakelite, Tokyo, Japan ; Figure 3B). Snare resection was performed below the band using blended electrosurgical current (Figure 3C). No bleeding, perforation, or other complications occurred.

Excised specimens showed complete removal of the lesion. Macroscopically, the tumour was located in the submucosa, without involvement of the muscularis propria (Figure 4A). Microscopic examination showed nests of large tumour cells with small round nuclei and

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Figure 1. — An upper gastrointestinal radiographic contrast examination revealing a small polypoid lesion in the lower oesophagus (arrow). The lesion is 8 mm in diameter and has a central depression.

abundant eosinophilic cytoplasm containing acidophilic, periodic acid-Schiff-positive granules. Immunohistologic examination demonstrated that the cells were reactive for S-100 (Figure 4B) and CD-68. These findings established a diagnosis of granular cell tumour of the lower esophagus.

## Discussion

Oesophageal GCT account for one-third of gastrointestinal tract GCT. Since Abrikossoff's first report in 1931, more than 200 GCT of the esophagus have been reported (10). Oesophageal GCT are generally considered benign, although a few malignant GCT have been reported (11,12). In malignant GCT, the size of the tumour is important since the malignant potential of GCT increases when the diameter exceeds 50 mm (13). However, malignant GCT as small as 10 mm have been reported (14). Ordinary endoscopic biopsy involving a small amount of tissue is unlikely to yield diagnostic tissue because the tumour typically is covered by normal mucosa. Therefore, preoperative diagnosis is difficult without total resection of the tumour. When we make a

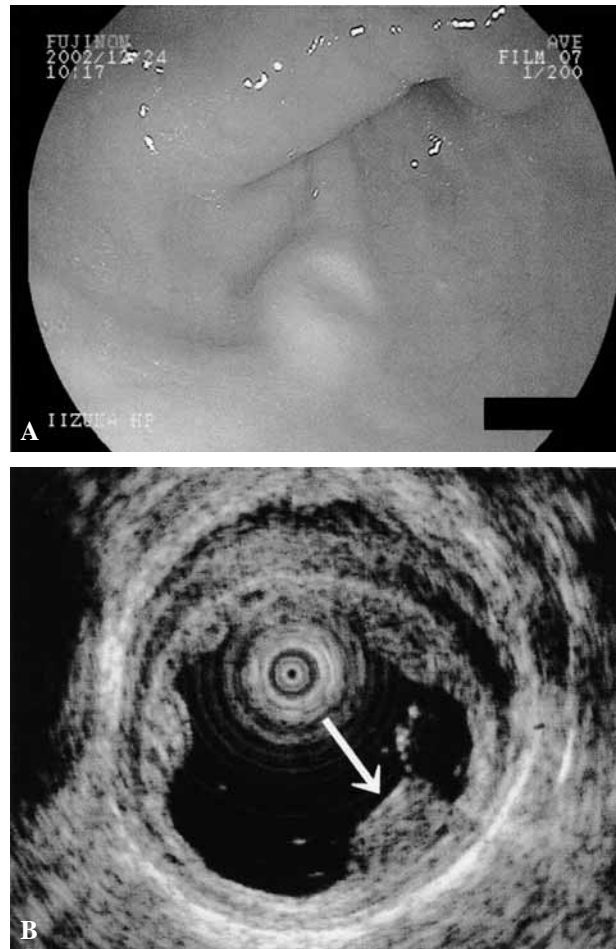


Figure 2. — Diagnostic endoscopy. A : Gastroduodenoscopy demonstrates a white to yellowish submucosal tumor with a central depression in the lower esophagus. B : Endoscopic ultrasonography using a 15-MHz ultrasound catheter probe shows a homogeneous hypoechoic mass in the submucosa without lymph node involvement.

diagnosis of GCT endoscopically, we should consider the possibility of malignancy.

Until recently, GCT was treated by an open surgical operation (1). Increasingly, appropriately situated GCT now are being removed by endoscopic resection (1-3,14). Conventional polypectomy using a diathermic snare is usually inappropriate for complete resection of a GCT (15). Use of this method is often associated with marginal involvement by residual tumour requiring subsequent intervention. New methods of treatment therefore have been sought. We performed EUS-guided endoscopic resection using band ligation in our case. Ono et al. reported that endoscopic resection of rectal carcinoid tumours using band ligation provided a deeper resection margin than conventional endoscopic mucosal resection or polypectomy (16). In our case, the oesophageal GCT was completely resected by this technique. Furthermore, this procedure is technically simple and minimally invasive (7,9,16,17).

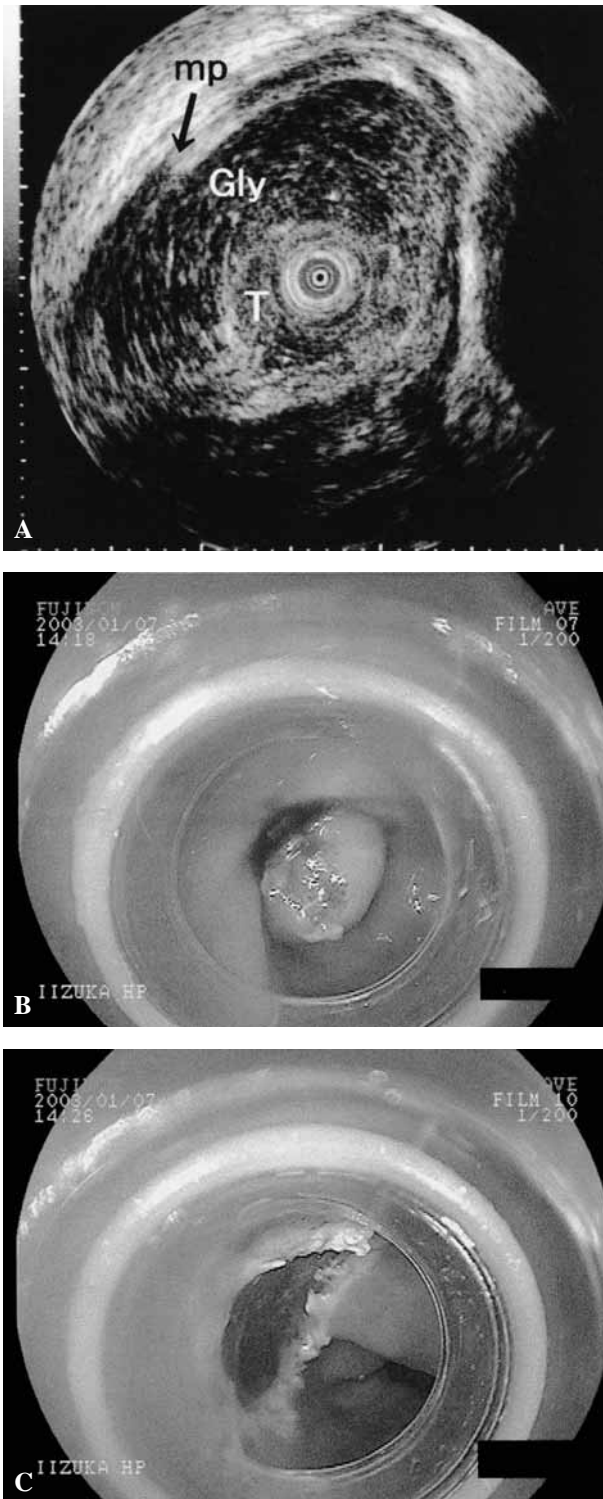


Figure 3. — Interventional endoscopy. A : Endoscopic ultrasonographic image of the lesion after injection of an epinephrine-supplemented glycerin (Gly) solution into the submucosal layer. Sufficient separation of the hypoechoic tumor (T) from the underlying muscularis propria layer was achieved (arrow-mp). B : Ligated lesion. C : Oesophageal ulceration after resection.

EUS has become indispensable, not only for diagnosing submucosal tumours but also in planning treatment

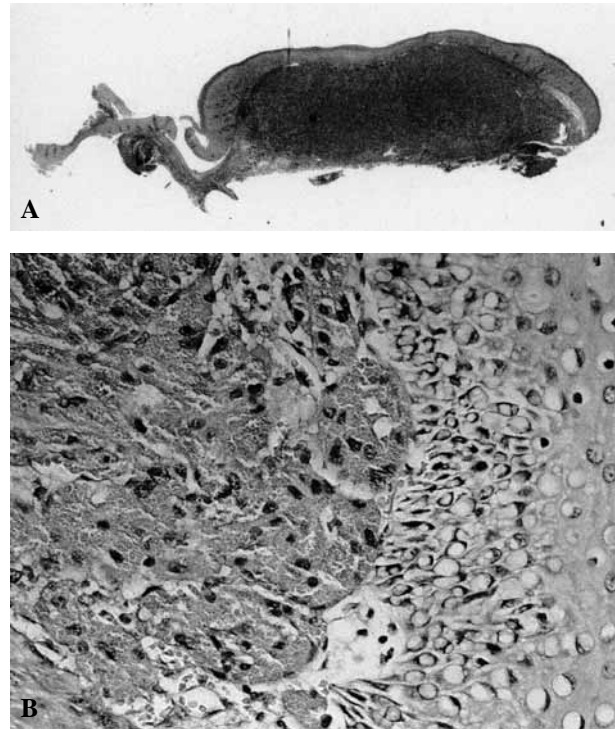


Figure 4. — Microscopic appearance of the tumour. A : The resected tumour is covered with normal mucosa (hematoxylin and eosin ; original magnification,  $\times 2$ ). B : Tumour cells are immunoreactive for S-100 protein (original magnification,  $\times 200$ ).

(1-3,8,9). Yasuda *et al.* have suggested that EUS is necessary to determine whether tumours meet criteria for endoscopic removal including small size ( $< 2$  cm) and nonattachment to the muscularis propria, as perforation is the most serious complication of endoscopic resection for oesophageal GCT. Injection of a solution as a cushion between the lesion and the muscle layer not only facilitates wide and deep excision but also reduces the risk of perforation by separating the lesion from the muscular layer, keeping muscle away from the snare. However, determining whether adequate separation of the tumour from the underlying muscularis propria has been achieved by the injection of the solution is difficult to determine by endoscopy alone. We previously reported that EUS can monitor intramural conditions during endoscopic resection (7-9,18). Scanning the target lesion with the ultrasound catheter probe under simultaneous endoscopic guidance is technically easy, and can be performed as needed during endoscopic treatment. Complete separation of the lesion from the muscle layer can be confirmed rapidly by imaging the lesion with the ultrasound catheter probe (6-9). We believe that our extensive use of the ultrasound catheter probe before resection helped us to avoid complications.

In conclusion, we successfully treated a 60-year-old man with oesophageal GCT by EUS-guided endoscopic resection using band ligation. This is a technically simple, minimally invasive, and safe procedure for treatment of a small oesophageal GCT confined to the submucosa.

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