Granular Cell Tumour in Stomach: a Case Report

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Abstract

Granular cell tumours are uncommon, usually benign soft tissue tumours. They are thought to be neural, arising from Schwann cells and can occur at various sites. Their occurrence in gastrointestinal tract is rare, the commonest site being oesophagus followed by large intestine. Gastric localization is unusual. A young female presented with abdominal discomfort since 3 months. Endoscopy showed a nodule in the body of stomach. Biopsy revealed features of granular cell tumour on microscopy, which was confirmed by immunohistochemical positivity for S100 and CD68. Wide excision of the tumour was performed. At the 6-month follow-up, patient was asymptomatic. The diagnosis of gastric granular cell tumour is based on endoscopic biopsy. Unless there is histological evidence of malignancy, wide local excision is an adequate surgical treatment.

Keywords Granular cell tumour · Stomach · Endoscopy · Immunohistochemistry · S100 · CD 68

Introduction

Granular cell tumours (GCT) are uncommon, usually benign soft tissue tumours. They are thought to be neural, arising from Schwann cells and can occur at various sites. The common locations are skin or subcutaneous tissues of the chest and upper extremities, tongue, breast, and female genital region [1]. The occurrence of GCT in the gastrointestinal (GI) tract is rare (approximately 8% of all GCTs); the commonest site being the oesophagus (65% of all GI tract GCT), followed by the large intestine. Gastric localization is unusual. Although most GCTs are benign, the malignant potential warrants evaluation with endoscopic ultrasound for possible endoscopic or surgical resection [2].

Case Presentation

A 28-year-old female presented with complaints of post-prandial abdominal fullness and bloating since 3 months. On examination, she was afebrile and pallor was present. Abdominal examination revealed soft, non-tender abdomen with no guarding, rigidity or organomegaly. She had no remarkable past medical history or history of alcohol consumption, smoking or drug intake.

Haemoglobin was 9.0 g/dl. Other haematological parameters were within normal limits. Viral markers (HIV/HBsAg/HCV) were negative.

Oesophago-gastro-duodenoscopy showed erythema in the stomach body and antrum with a 5 × 7 mm nodule in the mid body (Fig. 1a). The cricopharynx, oesophageal and duodenal mucosa were normal. Rapid urease test for *Helicobacter Pylori* was negative. Biopsies were taken from the gastric fundus, nodule and the second part of duodenum.

Grossly, two grey-white tissue bits aggregating 0.4 × 0.4 × 0.3 cm were received from the nodule.

Histo-pathological examination showed solid nests of round to polygonal cells with few spindle cells in the gastric mucosa and submucosa (Fig. 1b). The nuclei were round with slight variation in size, finely dispersed chromatin and inconspicuous nucleoli. The cytoplasm was abundant and finely granular (Fig. 1c). Mitotic activity was very low. Wispy collagen bundles were seen intersecting the lesion. Hence, the

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Fig. 1 **a** Gastrodudenoscopy showing an erythematous nodule in the body of the stomach (H&E, $\times 10$). **b** Biopsy showing nests of round to polygonal cells with few spindle cells (H&E, $\times 40$). **c** Cells with abundant and finely granular cytoplasm, round to oval nuclei with slight variation

in size, finely dispersed chromatin and inconspicuous nucleoli (IHC, $\times 40$). **d** S-100: strong nuclear and cytoplasmic positivity (IHC, $\times 40$). **e** CD 68: cytoplasmic and membrane positivity (IHC, $\times 40$). **f** Pancytokeratin: negative (IHC, $\times 40$)

pattern was compatible with GCT. The cytoplasmic granules were positive for periodic acid-Schiff (PAS) stain. Other mucosal biopsies were normal.

Immunohistochemistry (IHC) showed strong nuclear and cytoplasmic positivity for S-100 protein in all tumour cells (Fig. 1d) along with cytoplasmic and membrane positivity for CD 68 (Fig. 1e). Pancytokeratin was negative (Fig. 1f).

A final diagnosis of granular cell tumour was rendered.

Patient underwent wide local excision of the lesion. At the 6-month follow-up, patient was asymptomatic.

Discussion

GCT was first described by Abrikossoff in 1926 [1]. In the past, GCT were called granular cell myoblastoma because of suspected muscle origin [3]. Histogenesis of GCTs is controversial. Myoblast, Schwann cell, histiocyte, perineural fibroblast and undifferentiated mesenchymal cell origin has been postulated. Non-neoplastic nature of the lesion resulting from trauma, as a degenerative process or storage disorder has also been considered. However, recent studies support a peripheral nerve-related cell of origin based on ultra-structural findings [3].

Although almost any organ may be involved, 70–80% of GCTs appear as small asymptomatic masses in the skin,

subcutaneous tissue or mouth, particularly on the tongue. The occurrence of this tumour in the GI tract is rare, and may involve any site. Until 2006, only 29 cases had been reported in the stomach, and all of them were surgically treated [1]. Thereafter, very few cases have been described [2–4].

Gastric GCT more commonly occurs between fourth to sixth decades with no gender predisposition [1].

Most GCTs are found during endoscopy, X-ray or ultrasound performed for nonspecific dyspepsia [1]. Our patient presented with abdominal fullness and bloating. Upper GI scopy localised the lesion in the gastric body. When large, gastric GCTs may present as gastric outlet obstruction or massive upper GI haemorrhage. A definitive preoperative diagnosis of this tumour is established by histo-pathology of the endoscopic biopsy. Endoscopic ultrasonography has recently been used more frequently for determining the depth of tumour invasion in the GI wall [1, 3].

Gastric GCT mostly occurs as a submucosal, unencapsulated solitary greyish-white to yellow nodule or plaque, usually less than 3 cm [3]. Our patient had small solitary gastric nodule (5 $\times$ 7 mm) on endoscopy.

Histologically, GCT is composed of sheets or compact nests of plump round/polygonal and fusiform cells having abundant, slightly amphophilic granular cytoplasm (hence the name—granular) with small, round, centrally located uniform pyknotic nuclei [1, 3].

The cytoplasmic granules in GCT are PAS-positive with variable intensity and diastase resistant. The granules are also Sudan-positive on both the frozen and paraffin sections [5, 6].

IHC is positive for S-100, vimentin, NSE, CD68 and CD57. Expression of nestin, an intermediate filament protein found normally in neuroectodermal stem cells and early skeletal muscle, has been demonstrated [3, 6].

GCTs are generally benign neoplasms with 1–3% malignancy rate [5]. There are less than 30 reported cases of malignant GCTs in the literature and the only documented case of malignant gastric GCT was reported in 1996 by Matsumoto et al. [7]. There are reports of cases that have recurred or metastasized despite benign histologic appearance. Features associated with malignancy include local recurrence, invasion of adjacent organs, involvement of multiple layers in the GI tract, rapid growth, size greater than 4 cm, necrosis, spindling of tumour cells, cytologic atypia and high mitotic activity, vesicular nuclei with large nucleoli, high nuclear-to-cytoplasm ratio and increased mitotic activity [7]. Extent of infiltration, highly developed tumour micro vessels and focal pleomorphism are suggestive of malignant potential. To differentiate benign from malignant, the tumour size, rapidity of its growth and invasion of adjacent structures may be of greater value than the histologic picture alone. IHC positivity more than 10% Ki-67 index and 50% for p53 has been significantly correlated with malignancy [3].

Adequate local excision is usually curative and hence, was performed in our case. Endoscopic excision of gastric GCT can be considered. If the tumour is attached to muscularis propria, injecting saline can facilitate endoscopic removal. Since the gastric GCT is without capsule and focal areas of infiltration of the gastric wall can be present, laparoscopic or conventional wedge resection, including at least 1 cm of normal tissue, is the best therapeutic option. Earlier, conventional surgical approach was adopted. In those rare cases where the lesion is more aggressive, radical excision is indicated [6, 7]. Benign lesions may recur following incomplete local excision. Radiation and chemotherapy have no role in treatment [2, 4].

Conclusion

Gastric granular cell tumour is rare and its diagnosis is based on endoscopic biopsy. Unless there is histological evidence of

malignancy, wide local excision is an adequate surgical treatment.

Authors' Contributions AJ carried out data acquisition, data analysis & manuscript preparation will stand as guarantor also. AA carried out concepts & design, literature search, participated in clinical study. MK carried out concepts & design, literature search. AR participated in clinical study & manuscript review. All the authors have read & approved the final manuscript.

Data Availability All the data regarding the findings are available within the manuscript.

Compliance with Ethical Standards

Ethics Approval and Consent to Participate All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee.

Consent for Publication Consent for publication for this case reports and any additional related information was taken from the parents of the patients involved in the study.

Competing Interests The authors declare that they have no conflict of interest.

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