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Gastric Leiomyosarcoma - A Review and Two Cases

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Abbreviations

CT: Computed Tomography; EUS: Endoscopic Ultrasound; FDG-PET: Fluorodeoxyglucose-Positron Emission Tomography; GIST: Gastrointestinal Stromal Tumour; GOJ: Gastro-Oesophageal Junction; IHC: Immunohistochemistry; MDT: Multidisciplinary Team Meeting; MRI: Magnetic Resonance Imaging

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1. Abstract

Leiomyosarcoma is a rare malignant tumour of smooth-muscle origin, most commonly involving the retroperitoneum and uterus, and rarely the stomach. Gastric leiomyosarcoma accounts for 1% - 3% of all gastric malignancies and 0.1% of leiomyosarcomas of the gastrointestinal tract. The mainstay of treatment is surgical resection with limited adjuvant therapy options. There is currently a paucity of evidence available. We present two cases of gastric leiomyosarcoma and a review of the current literature.

1.1. Background

Two male patients in their sixties were referred with anaemia. They underwent appropriate clinical, radiological and endoscopic workup which demonstrated gastric smooth-muscle tumours with immunohistochemistry differentiating them from gastrointestinal stromal tumours, concerning for gastric leiomyosarcomas. Both were discussed at a multidisciplinary team meeting and underwent successful laparoscopic resection of the tumours with clear margins. Neither required adjuvant therapy. They remain clinically well at their respective follow ups with no evidence of recurrence.

2. Case Presentation

2.1. Case 1

A 62-year-old male with no significant medical history presented with symptomatic anaemia and melaena. Physical examination was unremarkable. Haemoglobin was 92 g/L with normal coagulation profile. He underwent urgent upper endoscopy which demonstrated multiple submucosal lesions at the gastric cardia with central ulceration and stigmata of recent bleeding (Figure 1A).

Computed-Tomography (CT) showed evidence of proximal gastric intussusception with heterogeneous mural thickening in the proximal-mid stomach, suspicious for an underlying neoplastic lesion (Figure 2A), and no distant metastatic disease. The lesion was avid on a Fluorodeoxyglucose-Positron Emission Tomography (FDG-PET) scan without any other concerning findings. Further Endoscopic Ultrasound (EUS) assessment confirmed submucosal lesion in the gastric cardia arising from muscularis propria and not involving the Gastro-Oesophageal Junction (GOJ).

Biopsy returned as an atypical smooth-muscle tumour, strongly positive Immunohistochemistry (IHC) staining for desmin, smooth- muscle actin and caldesmon but negative for c-kit (CD117) and DOG- 1, highly suspicious for leiomyosarcoma rather than Gastrointestinal Stromal Tumour (GIST). The patient underwent a laparoscopic partial gastrectomy with final histopathology confirming 6.5 cm gastric leiomyosarcoma and clear margins. The case was discussed at a Multidisciplinary Team (MDT) meeting and consensus was for surgical surveillance only. He remains well at follow up with no evidence of recurrence.

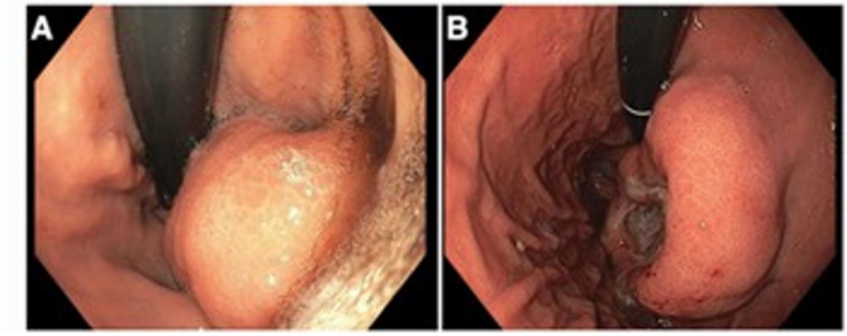

Figure 1: Upper endoscopic images during retroflexion demonstrating the submucosal masses at the gastric cardia (A) and proximal lesser curve (B).

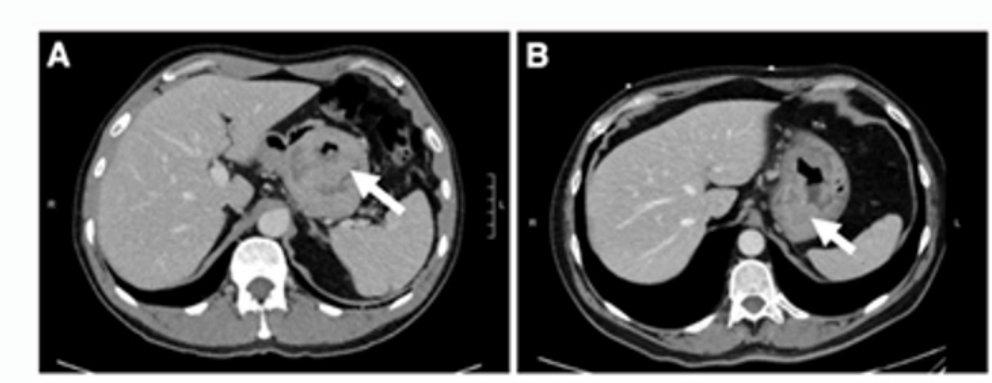

Figure 2: Computed tomography, axial sections of patient A and B, demonstrating thickening at the gastric cardia (A) and proximal lesser curve (B) (white arrows) suggestive of masses.

2.2. Case 2

A 62-year-old male with no medical history was referred following a CT-scan to investigate iron-deficiency anaemia which demonstrated abnormal thickening at the gastric fundus with lymphadenopathy along the lesser curvature (Figure 2B). History and physical examination were unremarkable other than lethargy. His pre-operative haemoglobin was 84 g/L with a normal coagulation profile and negative Helicobacter pylori serology.

Upper endoscopy demonstrated a malignant-appearing ulcerated mass at the proximal aspect of the lesser curve extending to the GOJ (Figure 1B). No other distant metastatic disease was identified on staging. Biopsy returned as features of an atypical smooth-muscle tumour positive for desmin on IHC and negative for c-kit (CD117), differentiating it from a GIST. An iron-infusion was given pre- operatively.

The patient underwent laparoscopic proximal gastrectomy and double-tract reconstruction with final histopathology confirming 15cm gastric leiomyosarcoma, no nodal involvement and clear margins. The case was discussed at an MDT and consensus was for surgical surveillance only. The patient developed an anastomotic stricture post-operatively which was successfully managed endoscopically. He has remained clinically well at subsequent follow up with no radiological or endoscopic evidence of recurrence.

3. Discussion

Gastric leiomyosarcoma is a rare malignant smooth-muscle tumour of the stomach with a paucity of evidence in the literature [1,2]. It has a variable prognosis and is often found incidentally due to vague symptomatology [3]. Workup includes complete history and examination, basic blood tests (full blood examination, urea and electrolytes, liver function tests), upper endoscopy and biopsy.

IHC of the biopsy sample is important in differentiating leiomyosarcoma (positive for desmin and smooth-muscle actin, negative for c-kit (CD117) and DOG-1) from GIST as the latter can be offered neoadjuvant imatinib in the instance of large, unresectable tumours for attempted downstaging [4]. Benign leiomyomata are also differentiated from GIST in the same manner, although the majority are less than 3 cm in size and typically exist as solitary, well- circumscribed lesions when compared with leiomyosarcomas [5]. This is important because leiomyomata are very slow-growing and carry virtually no risk of progression to leiomyosarcoma, with indications to operate only being if the patient becomes symptomatic [5].

CT-imaging (chest/abdomen/pelvis) is used for staging and FDG- PET can be useful in the assessment for metastatic disease [6,7]. EUS can be used to localise, further characterise its relationship with other structures (e.g. gastro-oesophageal junction) and assist with biopsy of the lesion [6]. MRI has less utility in gastric leiomyosarcoma compared with retroperitoneal leiomyosarcoma as the soft-tissue contrast to define the margins of the tumour can usually be seen with adequate definition on contrast-enhanced CT [7].

Curative treatment for leiomyosarcoma mirrors that of other sar-

comas, being R0 surgical resection [1,6-8]. Lymphadenectomy is not standard, though the true rates of nodal spread and metastasis are unknown due to the rarity of the condition [6]. Adjuvant radiotherapy can be considered in select cases, such as involved margins, and chemotherapy currently has no role [9]. No immunotherapy option exists as there are no currently known molecular targets [9]. A palliative-approach including limited surgical resection can be considered in advanced symptomatic disease or those unfit for radical resection [8].

Cases should be referred to the tertiary oesophagogastric unit for opinion and management as well as discussed at an MDT for consensus [5]. Surveillance is not standardised, though like other gastric malignancies, typically includes at least annual clinical review with annual surveillance CT-scan and upper endoscopy [6,8].

4. Conclusion

Gastric leiomyosarcoma is a rare soft tissue tumour and differentiation from GIST is important. Surgical resection remains the mainstay of treatment and due to their rarity, these tumours should be referred to subspecialist oesophagogastric units and respective MDT meetings for management.

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