GSC Advanced Research and Reviews
eISSN: 2582-4597 CODEN (USA): GARRC2
Cross Ref DOI: 10.30574/gscarr
Journal homepage: https://gsconlinepress.com/journals/gscarr/

(REVIEW ARTICLE)

Cutaneous Metastasis as the First Sign of Gastric Signet Ring Carcinoma: A Case Report of an Uncommon Clinical Presentation and a Brief Review of the Literature

Mareena Ayad [4], Shabnam Yazdanpanah [3], Thomas Saliba [3], Elizabeth Sanchez [5], Alireza Izadian Bidgoli [3], Jessica Jahoda [1, 2] and Mohamed Aziz [1, *]

[1] *Research Writing and Publication (RWP), LLC, NY, USA.*
[2] *Memorial Healthcare System, Pembroke Pines, FL, USA.*
[3] *American University of the Caribbean, AUC, St. Maarten.*
[4] *UMHS University of Medicine and Health Sciences, St. Kitts.*
[5] *Universidad Iberoamericana (UNIBE), Santo Domingo, Dominican Republic.*

GSC Advanced Research and Reviews, 2025, 25(03), 335-343

Publication history: Received on 20 November 2025; revised on 26 December 2025; accepted on 29 December 2025

Article DOI: https://doi.org/10.30574/gscarr.2025.25.3.0400

Abstract

Cutaneous metastasis as the initial presenting sign of an underlying gastric signet ring cell carcinoma (SRCC) is very rare and easily confused with benign dermatologic disease. We present a 46-year-old female who developed multiple firm, erythematous nodules over the breast, shoulder, and buttocks over 3 months. The skin lesions were initially treated as soft-tissue infections, but there was no response to therapy. A core biopsy of the skin ultimately disclosed metastatic adenocarcinoma with prominent intracytoplasmic mucin and signet-ring morphology; similar malignant cells were subsequently identified in pleural and ascitic fluids.

Immunohistochemical (IHC) studies demonstrated a CK7-positive, CK20-negative pattern with strong mucin expression and weak CDX2 labeling, consistent with an upper gastrointestinal primary. Cross-sectional imaging identified diffuse gastric wall thickening consistent with lienitis plastica, peritoneal and pleural involvement, and distant osseous metastases. Poorly differentiated signet ring cell gastric adenocarcinoma was confirmed through endoscopic biopsies, defining stage IV disease. Fluoropyrimidine-platinum chemotherapy and then second-line irinotecan failed to halt disease progression in this patient; her cancer reflected the classic chemo resistant behavior for this histologic subtype. She survived approximately two years after diagnosis.

This case thus underlines the need to include metastatic cancer in the differential diagnosis of any persisting or atypical skin nodule: an approach which calls for early biopsy and well-thought-out interpretation of immunophenotyping findings, followed by timely integration of imaging to disclose the silent gastric malignancy and guide management appropriately in a multidisciplinary manner.

Keywords: Gastric; Adenocarcinoma; Signet Ring Cell Carcinoma; Cutaneous Metastasis; Differential Diagnosis

1. Introduction

Gastric cancer is one of the leading causes of cancer-related deaths worldwide, and approximately 95% of cases are adenocarcinomas. [1] Gastric SRCC is an uncommon but extremely aggressive form of gastric adenocarcinoma with widespread infiltration, early cell proliferation, and poor prognosis. Metastatic lesions can appear in other organs such as the liver, peritoneum, and regional lymph nodes. However, cutaneous metastases may be present in less than 1% of cases, are more common in males than females, and usually suggest advanced disease. [2] [3] Sometimes, these lesions

* Corresponding author: Mohamed Aziz

mimic benign skin disorders like infections, panniculitis, or inflammatory nodules, which makes the underlying pathology more difficult to diagnose. [3]

New evidence suggests it is important to maintain high clinical vigilance when considering persistent or atypical skin nodules in people with either Helicobacter pylori (H. Pylori), associated gastric disease or other gastrointestinal cancer risk factors. [4] IHC analysis remains essential for determining the primary tumor site. Mucin-rich cytology and CK7-positive/CK20-negative profiles strongly corroborate an upper gastrointestinal origin. [5]

This report describes an unusual case of gastric SRCC in a 46-year-old female who presented with the first clinical suspicion of malignancy in the form of an increased number of progressive erythematous cutaneous nodules. The case highlights the diagnostic difficulties, rapid progression of SRCC, and the requirement for team-based assessment when addressing unusual metastatic patterns.

2. Case presentation

2.1. Clinical presentation, history, and physical exam

A 46-year-old Female reported to the dermatology clinic with a three-month history of progressive erythematous nodular lesions of the skin. These lesions were initially thought to be recurrent soft-tissue infections, but antibiotic and topical corticosteroid treatment did not result in significant improvement. The patient also reported that the lesions had recently become swollen which then required further examination.

Physical examination showed several hard, non-tender subcutaneous nodules. The biggest one was 2.5 cm in diameter at the left breast (lower inner quadrant), and the rest at the right shoulder (1.5 cm) and left buttock (1 cm). A unique, central, erythematous induration characterized the lesions. There were no significant findings on cardiovascular and pulmonary examinations, but reduced breath sounds at the lung bases indicated small effusions. The percussion and evaluation of fluid waves of the abdomen revealed no hepatosplenomegaly or palpable masses, but mild ascites.

The medical history of the patient was notable for controlled hypertension, depression, and a history of recurrent H. Pylori infection with reported gastric intestinal metaplasia on some of her past endoscopic surveillance. Her medical history also included a sigmoid colon segmental resection involving complicated diverticulitis eleven years ago and a cholecystectomy two years ago. She is an ex-heavy smoker who stopped smoking 6 years ago and has moderate alcohol consumption. The family history was significant as her father died of pancreatic cancer at the age of 64, and her mother had breast cancer, which led to her death at the age of 51.

2.2. Initial diagnostic steps: Skin biopsy, pleural and ascitic fluid, and initial differential diagnosis

Given the unexpected clinical course and lack of response to standard therapy, a core biopsy of the skin lesion was performed. A histopathologic analysis showed an adenocarcinoma with predominant signet cell features scattered throughout the dermis and subcutaneous tissue, highly compatible with the presence of a metastatic disease. (Figure 1 A, B, C) The architectural morphologic features and absence of an in-situ element ruled out primary cutaneous adenocarcinoma.

At the same time, diagnostic thoracentesis and paracentesis were done to assess the pleural effusion and ascites. Cytologic examination of the two fluids revealed malignant cells with cytomorphologic features similar to those of the skin biopsy. Both fluids contained abnormal cells that had eccentric nuclei and intracytoplasmic mucin, typical of metastatic adenocarcinoma.

Immunohistochemistry (IHC) tests significantly aided in deciding the primary site. Cytokeratin AE1/AE3, CK7, CK18, CK19, and CEA were strongly positive in the tumor cells, whereas CDX2 expression was weak. The mucin stains were strongly positive, showing intracytoplasmic mucin vacuoles. (Figure 2 A, B, C) The following IHC markers were negative: TTF-1 (excluding lung primary), ER, PR, and GCDFP (excluding breast primary), P63 and CK5/6 (excluding squamous differentiation), and vimentin (usually positive in colon carcinoma. The CK7+/CK20-/mucin and weak CDX2 expression indicated an upper gastrointestinal tract origin, namely, gastric adenocarcinoma.

Breast, lung, ovarian, and upper gastrointestinal primaries were included as the differential diagnosis of CK7-positive adenocarcinoma that has cutaneous metastases. Nonetheless, due to the history of recurrent H. pylori infection with intestinal metaplasia and the unique immunophenotype, accompanied by peritoneal carcinomatosis, the diagnosis of metastatic gastric adenocarcinoma was the first choice, which required emergency gastroenterological consultation.

2.3. Radiological features

Focused on abdomen and stomach: After the initial pathologic diagnosis, extensive imaging was performed to determine the primary malignancy and evaluate the extent of the disease. Diffuse thickening of the gastric wall, particularly of the body and antrum, and absence of normal rugal folds were seen in contrast-enhanced computed tomography (CT) of the chest, abdomen, and pelvis. This is an indication of linitis plastica, a growth pattern seen in signet ring cell carcinoma.

Abdominal CT showed medium-sized ascites, nodularity in the peritoneum, and an increase consistent with peritoneal carcinomatosis. Several peritoneal implants were seen on the greater omentum (omental caking) and the peritoneum in the pelvis. Minimal bilateral pleural effusions were established. is crucial to mention that no definite gastric mass was observed, which indicates the infiltrative character of signet ring carcinoma, instead of the mass-forming one. The patient had lymphadenopathy in the region, and the enlarged perigastric and celiac axis lymph nodes were up to 2 cm. The liver and spleen appeared normal, without any foci.

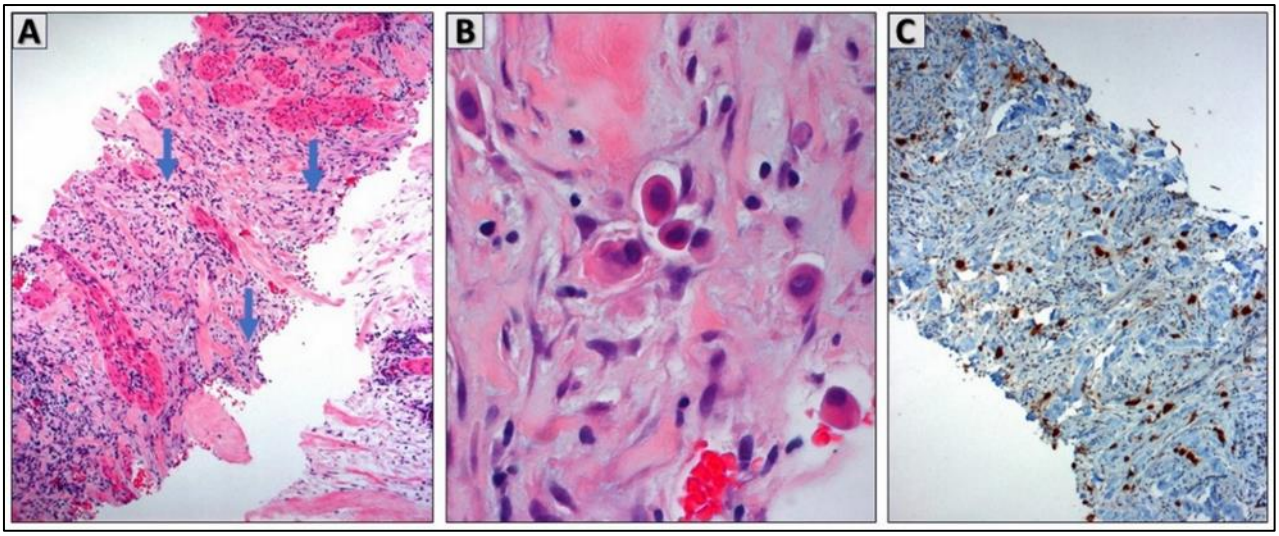
An upper gastrointestinal endoscopy revealed pale, rigid mucosa with no ulceration or masses, compatible with linitis plastica. It was confirmed by multiple biopsies of the gastric body and antrum, which showed poorly differentiated signet-ring cell adenocarcinoma. Complete staging was then done by positron emission tomography-CT (PET-CT), which revealed FDG-avid gastric wall thickening, peritoneal implants, and numerous bone lesions in the vertebrae, ribs, and pelvis, which proved the extensive presence of metastatic disease and bone involvement. Gastroscopic biopsy confirmed the stomach as the primary tumor. Cutaneous, peritoneal, pleural, and osseous metastases combined to form stage IV disease. (Figure 3 A, B, C)

2.4. Multidisciplinary tumor board discussion, treatment, response, and outcome

The case was discussed in the multidisciplinary tumor board, including medical oncology, gastroenterology, pathology, radiology, and palliative care. Since the stage IV case was presented with peritoneal carcinomatosis, malignant effusions, bone metastases, and cutaneous involvement, the tumor was considered unresectable. The debate was based on systemic palliative chemotherapy versus best supportive care.

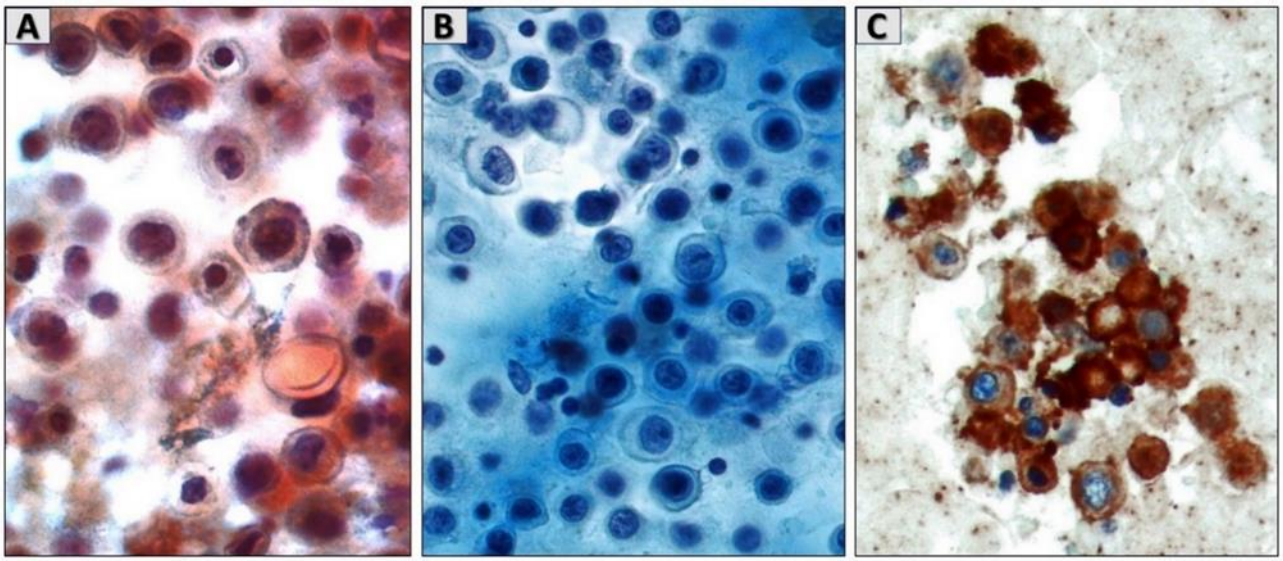
The overall recommendation was to use a fluoropyrimidine and platinum-based doublet chemo medication regimen. With this signet-ring histology, which has an aggressive biology and a low prognosis, treatment response was anticipated with a low degree of optimism. The IHC test for HER2 was negative, ruling out trastuzumab therapy. Programmed death-ligand 1 (PD-L1) testing and microsatellite instability (MSI) analysis were performed; however, the tumor demonstrated low microsatellite stability and very low PD-L1 expression, making immune checkpoint inhibitor monotherapy inappropriate. The patient started therapy with fluoropyrimidine and platinum-based doublet therapy, with the malignant ascites and pleural effusions being treated simultaneously using intermittent therapeutic paracentesis and thoracentesis. Three months into the first imaging, the disease was stabilized, and there was little change in tumor burden. This is a typical trend in signet ring carcinoma, which tends to be chemo resistant. Six months later, there was disease progression with enlarging peritoneal deposits and new hepatic metastases. The treatment was then tried with irinotecan-based chemotherapy as a second-line therapy, but was not tolerated.

Therapeutic interventions were followed by progressive disease. The patient also had progressive deterioration in performance status accompanied by ascites, cachexia, and bone metastasis. Palliative services were upscaled, with an emphasis on symptom control and quality of life. Her family reported that the patient survived about eleven months after the diagnosis.



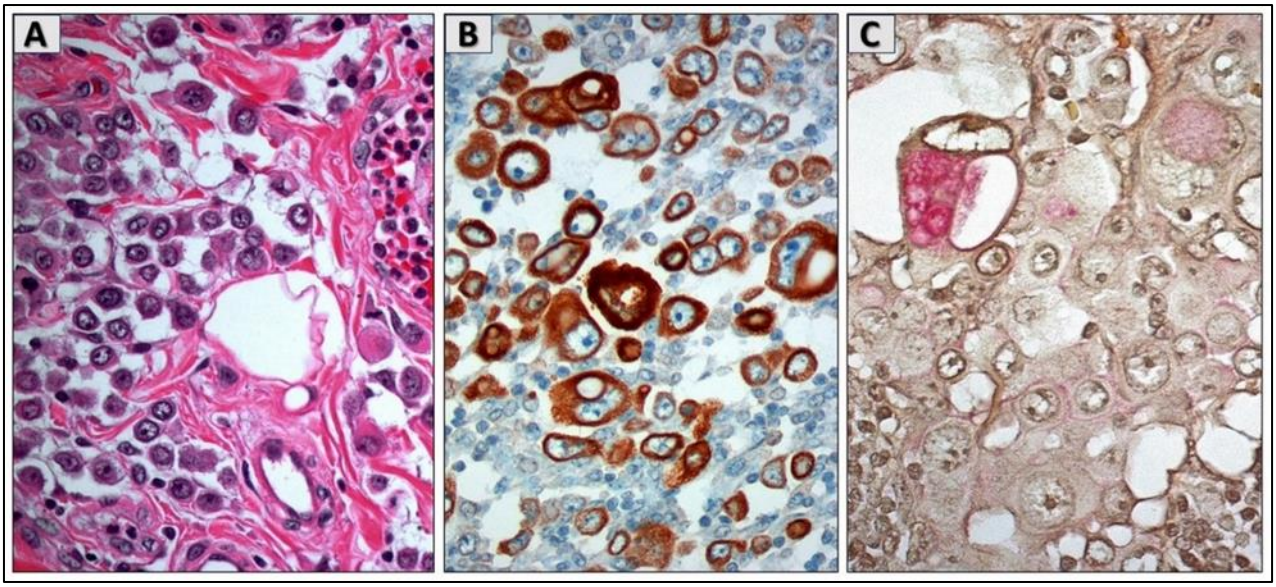
1A Low power view showing infiltration by predominantly single malignant cells (H&E stain X20).
1B High power view showing dyscohesive pleomorphic tumor cells with signet cell features, large cytoplasmic mucin droplet pushing the nucleus to the periphery (H&E stain X60)
1C Tumor cells positive for cytokeratin.

Figure 1 Histomorphology of the skin nodule with metastasis



2A: High power view showing signet cell features, large cytoplasmic mucin droplet pushing the nucleus to the periphery (Papanicolaou (Pap) stain X60).
2B: High power view showing signet cell features, large cytoplasmic mucin droplet pushing the nucleus to the periphery (Papanicolaou (Pap) stain X60).
2C: Tumor cells positive for cytokeratin.

Figure 2 Cytomorphology of the malignant ascitic fluid



3A: High power view showing dyscohesive cells with signet cell features (H&E stain X60).
3B: Tumor cells positive for cytokeratin.
3C: Tumor cells positive for mucin.

Figure 3 Histomorphology of gastric biopsy with signet ring cell adenocarcinoma

3. Discussion

3.1. Background (History, epidemiology, and WHO classification)

Despite the decreased incidence of gastric cancer in many regions, gastric cancer remains one of the most common causes of cancer-related mortality worldwide. Gastric cancer is the fifth most frequently diagnosed cancer and the fourth leading cause of tumor-related death in the world. [6] According to the World Health Organization (WHO) classification, gastric adenocarcinoma is histologically categorized into four types: tubular, papillary, mucinous, and SRCC. SRCC is characterized by tumor cells with abundant intracytoplasmic mucin, which causes eccentric displacement of the nucleus and a typical "signet ring" appearance. [7]

The rate of SRCC has been rising throughout the past 40 years, especially in younger patients and women, compared with non-SRCC (intestinal type) gastric adenocarcinoma that occurs more predominantly in older men. [8] SRCC is closely related to the diffuse type of gastric cancer, according to Lauren's classification, characterized by poorly cohesive cancer cells and no gland formation, with an infiltrative growth pattern leading to linitis plastica in its advanced stages. [9]

Epidemiologically, it is associated with H. pylori infection, chronic gastritis, and a genetic background, mainly the CDH1 germline mutations, which impair E-cadherin function responsible for hereditary diffuse gastric cancer. [10] In the case presented, the history of repetitive H. pylori infection and gastric intestinal metaplasia may also indicate established premalignant pathways in diffuse-type carcinoma.

SRCC is usually diagnosed at an advanced stage due to its submucosal spread, minimal early mucosal changes, and a lack of mass-forming lesions. Therefore, patients are often diagnosed with peritoneal carcinomatosis, malignant ascites, and late-stage metastatic disease, rather than early localized disease.

3.2. Comparative analysis of our case with the existing literature.

3.2.1. Clinical presentation and radiological findings

The clinical and radiographic findings in this case exhibited a challenging but typical form of advanced gastric SRCC, characterized by its unusual presentation with cutaneous metastasis. When comparing our case with the current literature, several similarities and distinctions become apparent. It is also important to note that, according to the current literature, cutaneous metastasis is a very rare presentation of visceral organ cancer. [11]. Our patient reported a family history of visceral organ cancer which is not always reported in the literature of patients with a similar condition. The patient clinically demonstrated hard, non-tender subcutaneous nodules that were initially mistaken for

recurrent soft-tissue infections, a presentation reported in the literature on cutaneous metastasis from SRCC, which may resemble benign dermatoses, such as papulonodular lesions or erysipelas-like eruptions. [12] [13] However, the nodules were spread on the breast, shoulder, and buttocks of the patient, which was more disseminated than the usual location, such as the thoracoabdominal wall. In addition, the coexistence of concurrent malignant pleural effusion and ascites with cytologic confirmation implied that there was widespread peritoneal and serosal involvement at the time of presentation; this fulfills a criterion for aggressive diffuse SRCC. [14]

The case was radiologically highly characteristic of advanced SRCC. Regarding the CT scan, there was diffuse thickening of the gastric wall (up to 15 mm) with loss of normal rugal folds. This is the pathognomonic radiographic equivalent of linitis plastica, a growth pattern frequently seen with SRCC. [15] CT scan did not demonstrate an obvious gastric mass, more typical of the infiltrative non-mass-forming nature of diffuse-type SRCC as opposed to standard mass-forming intestinal-type adenocarcinoma. [16] [17] The large volume of peritoneal nodularity and omental caking is compatible with the diagnosis of peritoneal carcinomatosis, providing additional support for the diagnosis of advanced diffuse-type SRCC. This is concordant with several adverse prognostic features as noted in published series. [14] The association of occult primary tumor, linitis plastica, and extensive involvement by serosal and cutaneous metastasis highlighted the extremely aggressive and silent behavior of this cancer.

3.2.2. Management and outcomes

Tumor resection and gastrectomy are the preferred treatment methods for gastric SRCC. [2] The late staging, evidence of metastasis, cutaneous involvement, and overall degree of disease advancement made this tumor unresectable in this case. Cutaneous metastasis is an unusual clinical presentation of gastric cancer, with only 0.8-1% reported among patients with gastrointestinal malignancy. [12] Less frequently, the presentation of skin metastasis occurs as a primary clinical indication of an occult gastric carcinoma. [12] The most reported cutaneous pattern includes erythematous nodules, “carcinoma escapelands,” or indurated plaques often confused with benign dermatologic pathologies or soft-tissue infections, paralleling the initial misdiagnosis and course in this case [19]. Our case demonstrates a metastatic distribution typical of diffuse-type SRCC. Previous reports emphasized that SRCC has a predilection for transcoelomic spread with the development of peritoneal carcinomatosis, ascites, and pleural effusions. Bone metastasis, as demonstrated in this patient, is less common but has been reported more frequently with advanced diffuse-type gastric cancer. [16]

Literature review suggests that cutaneous metastasis from SRCC of the stomach is generally associated with systemic widespread disease, indicating a poor prognosis with a median survival between 3 and 12 months after diagnosis. [13] [20] The patient's 13-month survival represents the upper end of what has been reported for diffuse-type gastric cancer with skin involvement. However, it is still consistent with the aggressive nature of SRCC.

The immunophenotype in this case (CK7+/CK20-, mucin+, weak CDX2 expression) is consistent with published data on SRCC, including CK7 positivity, variable CK20 expression, and weak-to-moderate CDX2 staining, reflecting intestinal metaplasia-associated differentiation. The IHC panels are important to the exclusion of alternative primaries such as breast, lung, and ovarian cancer, and were necessary for investigation in this case to reach a diagnosis. The lack of TTF-1, ER/PR, GCDFP-15, and WT1 also favored the gastric origin, consistent with diagnostic algorithms [21].

Because of its general resistance to chemotherapy and common peritoneal metastasis, treatment for gastric SRCC is very difficult, especially in advanced stages. [14] Fluoropyrimidine and platinum-based doublets remain the backbone of first-line systemic therapy for metastatic gastric cancer for most patients. The NCCN and ESMO guidelines list various specific doublet regimens (e.g., FOLFOX, CAPOX) as preferred options. [22] However, chemotherapy responsiveness in SRCC is inferior compared to intestinal-type adenocarcinoma, with reported response rates as low as 9-25% in some series. [23] The stability of the disease over a few months in this case corresponds to the literature mentioning temporary partial responses followed by rapid progression, due to the chemoresistant nature of SRCC. Studies are also unclear about which therapy is best between neoadjuvant chemoradiotherapy, cytoreductive surgery, and hyperthermic intraperitoneal chemotherapy because of general chemoresistance [24], while some studies have shown promising results, others have found minimal changes in life expectancy. [24]

Immunotherapy methods are often useful cancer treatments. However, only some SRCCs are found to express HER2, PD-L1, or microsatellite instability (MSI), limiting their potential as a treatment option for all patients. [18] PD-L1 expression in SRCC is not uniformly low; studies have reported varying prevalence rates, with some reporting expression in approximately 40-45% of cases. MSI-H is typically reported in the low single digits for gastric SRCC (around 3.5%) and slightly higher, though still infrequent, for colorectal SRCC (around 20%). [25] The patient’s MSI and low PD-L1 expression are in line with those reported in the literature. The prognosis of diffuse-type SRCC is associated

with rapid progression, peritoneal and cutaneous metastasis, resistance to systemic therapy, and an overall poorer survival. [14] More studies are needed to understand the molecular targets for this cancer.

Our current understanding of this cancer remains unclear, presenting many challenges. Most patients are already at stage III or IV by the time they are diagnosed, with a 5-year survival rate of less than 5%. [1] Further research is needed to understand the molecular characteristics of gastric SRCC and reduce mortality in this patient group.

4. What have we learned from this case?

This case offered valuable lessons for various specialty clinicians. The most important lesson was the need to maintain a high index of suspicion for internal malignancy in cases with atypical or treatment-resistant cutaneous nodules, and even in absence of classic gastrointestinal symptoms. Misdiagnosis as a soft-tissue infection or skin lesion was the initial diagnosis; this rare presentation should be considered in the differential diagnosis. [17] The case highlighted the aggressive biologic behavior of SRCC, which presented as a widely disseminated metastatic disease, cutaneous, peritoneal, pleural, and osseous, from a clinically silent primary. [14]

Additionally, the radiologic findings were informative, showing the typical CT appearance of linitis plastica, with diffuse gastric wall thickening without a discrete mass. A reported characteristic finding of diffuse type SRCC. [16] The aggressive nature and inadequate response to conventional chemotherapy as seen in this SRCC reflected an urgent requirement for early definitive diagnosis and an unfavorable prognosis related to the advanced stage of disease presented for some time. [16] After all, the case was a strong reminder that any uncharacteristic lesion on the skin had to be properly worked up, starting with a skin biopsy, because this may be the only observable manifestation of a devastating underlying malignancy.

Abbreviations

- Signet ring cell carcinoma (SRCC);
- Immunohistochemistry (IHC);
- Programmed death-ligand 1 (PD-L1);
- Microsatellite instability (MSI)

5. Conclusion

We report this case to emphasize the extremely rare and diagnostically difficult presentation of gastric SRCC with a cutaneous metastasis as the sole initial clinical evidence. Our case also expands the medical literature, as it serves as a reminder that metastatic adenocarcinoma must be included in the differential diagnosis when atypical and unresponsive skin nodules are present, especially in patients with risk factors such as a history of H. pylori infection or gastric intestinal metaplasia. We report this unusual clinical presentation with corresponding characteristic radiographic findings to alert dermatologists, gastroenterologists, and oncologists, enabling earlier diagnosis and limiting delays in oncologic treatment, as seen with this highly lethal tumor.

Compliance with ethical standards

Acknowledgments

Special thanks to Anna Claire Brock, Jennifer C Ejeh, and Luigi Colangelo for their assistance in reviewing the final manuscript. Additionally, we appreciate the assistance of Grammarly's language editor, which provided valuable writing support by identifying and correcting errors in grammar, spelling, punctuation, and style, ultimately enhancing the manuscript.

Disclosure of conflict of interest

All authors make the following declarations:

- Payment/services information: All authors have declared that they received no financial support from any organization for the submitted work.
- Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might be interested in the submitted work.

Statement of ethical approval

Ethical review and approval were not required for this study involving human participants. The paper has been sufficiently anonymized to maintain the patient's confidentiality.

Data access statement

All relevant data are included in the paper.

Author contributions

All authors contributed equally to producing this manuscript.

Statement of informed consent

The patient expired; consent to publish this case was obtained from the family. The paper has been sufficiently anonymized to maintain patient confidentiality.

References

[1] Zhao W, Jia Y, Sun G, Yang H, Liu L, Qu X, Ding J, Yu H, Xu B, Zhao S, Xing L. Single-cell analysis of gastric signet ring cell carcinoma reveals cytological and immune microenvironment features. Nature Communications. 2023 May 24;14(1):2985.

[2] Fukui Y, Kubo N, Sakurai K, Tamamori Y, Maeda K, Ohira M. Metachronous port site, muscular and subcutaneous metastases from a gastric adenocarcinoma: a case report and review of articles. Surgical Case Reports. 2021 May 19;7(1):124.

[3] Hao W, Chang R, Liu J, Wang Y, Ren M, Xin K, Liu B, Xie J, Yang Y. Case report: A case of advanced gastric cancer with multiple skin metastases, with significant relief from immunotherapy. Frontiers in Immunology. 2024 Feb 29;15:1356350.

[4] Guarneri C, Ceccarelli M, Rinaldi L, Cacopardo B, Nunnari G, Guarneri F. Helicobacter pylori and skin disorders: a comprehensive review of the available literature. European Review for Medical & Pharmacological Sciences. 2020 Dec 1;24(23).

[5] Dum D, Menz A, Völkel C, De Wispelaere N, Hinsch A, Gorbokon N, Lennartz M, Luebke AM, Hube-Magg C, Kluth M, Fraune C. Cytokeratin 7 and cytokeratin 20 expression in cancer: A tissue microarray study on 15,424 cancers. Experimental and molecular pathology. 2022 Jun 1;126:104762.

[6] Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2021 May;71(3):209-49.

[7] Nagtegaal ID, Odze RD, Klimstra D, Paradis V, Rugge M, Schirmacher P, Washington KM, Carneiro F, Cree IA. The 2019 WHO classification of tumours of the digestive system. Histopathology. 2019 Nov 13;76(2):182.

[8] Henson DE, Dittus C, Younes M, Nguyen H, Albores-Saavedra J. Differential trends in the intestinal and diffuse types of gastric carcinoma in the United States, 1973–2000: increase in the signet ring cell type. Archives of pathology & laboratory medicine. 2004 Jul 1;128(7):765-70.

[9] Lauren P. Diffuse and so-called intestinal type carcinoma: an attempt at histological classification. Acta Pathol Microbiol Scand. 1965;64:31-49.

[10] Fitzgerald RC, Hardwick R, Huntsman D, Carneiro F, Guilford P, Blair V, Chung DC, Norton J, Ragunath K, Van Krieken JH, Dwerryhouse S. Hereditary diffuse gastric cancer: updated consensus guidelines for clinical management and directions for future research—Journal of medical genetics. 2010 Jul 1;47(7):436-44.

[11] George AA, Peter D, Masih D, Thomas M, Pulimood S. Cutaneous metastases from signet cell carcinoma of the gut: a report of two cases. Indian Dermatology Online Journal. 2016 Jul 1;7(4):281-4.

[12] Tian L, Ye ZB, Du YL, Li QF, He LY, Zhang HZ. Inflammatory cutaneous metastases originating from gastric cancer: A case report. World Journal of Clinical Cases. 2023 Dec 16;11(35):8411

[13] Patel K, Daugherty D, Jagadish A, Patel S, Patel D, Al-Housseiny A, Soike T, Al-Housseiny A. Cutaneous Metastasis of Gastric Adenocarcinoma: A Report of a Rare Case and a Literature Review. Cureus. 2025 Sep 20;17(9).

[14] Graziosi L, Marino E, Natalizi N, Donini A. Prognostic survival significance of signet ring cell (src) gastric cancer: Retrospective analysis from a single western center. Journal of Personalized Medicine. 2023 Jul 19;13(7):1157.

[15] Garcia A, Maqsudlu A, Dhawan I, Chaaya A. A Rare Case of Cutaneous Gastric Adenocarcinoma With Signet Ring Cell Features. ACG Case Reports Journal. 2024 Mar 1;11(3):e01299.

[16] Chow TK. Taşlı Yüzük Hücreli Mide Karsinomunun İzole Yaygın Kemik İliği Metastazları. Molecular Imaging and Radionuclide Therapy. 2024 Jun 28.

[17] Sakhri S, Zemni I, Mansouri H, Boujelbene N. Cutaneous metastasis from gastrointestinal cancer: A rare presentation: Case series. International Journal of Surgery Case Reports. 2025 Apr 1;129:111158.

[18] Oiseth SJ, Aziz MS. Cancer immunotherapy: a brief review of the history, possibilities, and challenges ahead. Journal of cancer metastasis and treatment. 2017 Oct 31;3:250-61.

[19] Kaur S, Aggarwal P, Dayal S, Sangwan A, Jain V, Jindal N. "Cutaneous Metastasis from Signet-ring Gastric Adenocarcinoma in a Carcinoma En Cuirasse Pattern: An Unusual Clinical-diagnostic Sequence" Indian J Dermatol. 2015 Nov-Dec;60(6):637

[20] Piessen G, Messager M, Leteurtre E, Jean-Pierre T, Mariette C. Signet ring cell histology is an independent predictor of poor prognosis in gastric adenocarcinoma regardless of tumoral clinical presentation. Annals of Surgery. 2009 Dec 1;250(6):878-87.

[21] Lookingbill D, Spangler N, Sexton F. "Skin involvement as the presenting sign of internal carcinoma. A retrospective study of 7316 cancer patients" J Am Acad Dermatol. 1990 Jan;22(1):19-26.

[22] Cheng J, Cai M, Shuai X, Gao J, Wang G, Tao K. First-line systemic therapy for advanced gastric cancer: a systematic review and network meta-analysis. Therapeutic advances in medical oncology. 2019 Sep;11:1758835919877726.

[23] Lemoine N, Adenis A, Bouche O, Duhamel A, Heurgue A, Leteurtre E, Amela E, Salleron J, Hebbar M. Signet ring cells and efficacy of first-line chemotherapy in advanced gastric or oesogastric junction adenocarcinoma. Anticancer Research. 2016 Oct 1;36(10):5543-9.

[24] Kumar NA, Jose A, Usman N, Rajan K, Munisamy M, Shetty PS, Rao M. Signet ring cell cancer of stomach and gastro-esophageal junction: molecular alterations, stage-stratified treatment approaches, and future challenges. Langenbeck's Archives of Surgery. 2022 Feb;407(1):87-98.

[25] Puccini A, Poorman K, Catalano F, Seeber A, Goldberg RM, Salem ME, Shields AF