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CONTENTS

CASE REPORTS

CASE REPORT

DOI: 10.4274/cmj.galenos.2025.74755
J Cau Med Sci 2025;3(3):15-17

Emphysematous Gastritis in an 88-Year-Old Male: A Case Report

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ABSTRACT

Emphysematous gastritis is an uncommon, yet severe infection of the stomach caused by gas-producing bacteria. Due to the condition's non-specific presentation and high mortality rate, early recognition is crucial for improving patient outcomes.This case describes an 88-year-old male with a history of diabetes mellitus and congestive heart failure, who presented with abdominal pain, nausea, and hematemesis. A computed tomography scan confirmed emphysematous gastritis, revealing air within the gastric wall. Given his advanced age and comorbidities, the patient underwent conservative treatment, including broad-spectrum antibiotics, intravenous fluids, and nutritional support. Although his initial condition stabilized, he later developed hospital-acquired pneumonia, which led to respiratory failure and ultimately death on day sixteen of hospitalization.Managing emphysematous gastritis presents a significant challenge. While surgical treatment is recommended in some cases, conservative approaches involving aggressive antibiotic therapy and supportive care may serve as viable alternatives for high-risk patients. Timely diagnosis and individualized treatment strategies play a crucial role in optimizing outcomes.This report underscores the importance of early diagnosis and close monitoring in emphysematous gastritis. Clinicians should consider this rare condition in critically ill patients with acute gastrointestinal symptoms. Conservative management may be beneficial in select cases, though further research is necessary to define optimal treatment protocols.

Keywords: Emphysematous gastritis, Gas-forming bacteria, Gastrointestinal infection, Conservative treatment

INTRODUCTION

Emphysematous gastritis is a rare but potentially fatal condition characterized by the presence of gas-forming bacteria within the gastric wall. It often arises due to local bacterial invasion or hematogenous spread from a distant site. Affected individuals typically present with critical illness, systemic toxicity, and multiple comorbid conditions, making early diagnosis and management challenging [1]. Despite its severe nature, no universally accepted treatment protocol exists. In certain cases, total gastrectomy may be necessary for sepsis control and patient stabilization, but due to the frailty of affected individuals, surgical intervention may not always be feasible. This report highlights the clinical course and management of a patient diagnosed with emphysematous gastritis.

CASE REPORT

An 88-year-old male presented to the emergency department with complaints of persistent abdominal pain, nausea, and hematemesis. His medical history included diabetes mellitus, asthma, and congestive heart failure. On admission, he was conscious and cooperative, with unstable vital signs including hypotension (95/52 mmHg), tachycardia (132 bpm), and increased respiratory rate (26 breaths per minute). Physical examination revealed abdominal tenderness without peritoneal signs.

Laboratory investigations showed mild anemia [hemoglobin: 13.5 g/dL (reference range for males: 14-18 g/dL)], elevated white blood cell count [12,380/µL (reference range: 4,500-11,000/µL)], and significantly raised C-reactive protein (CRP)

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[223 mg/L (reference range: 0-5 mg/L)]. His kidney function was impaired, with creatinine at 1.91 mg/dL (0.7-1.3 mg/dL) and blood urea nitrogen at 52 mg/dL (6-24 mg/dL). Serum potassium was elevated at 6.1 mmol/L (3.5-5.5 mmol/L). The Acute Physiology and Chronic Health Evaluation 2 score, calculated after the patient's admission to the intensive care unit (ICU), was 23.

A computed tomography (CT) scan identified intramural gas in the gastric wall and air within the portal vein, confirming emphysematous gastritis (Figure 1). Based on the patient's history, it was noted that no prior biliary interventions were recorded.

Upon admission to the ICU, the surgical team assessed the case and determined that, due to his advanced age and comorbidities, surgical intervention posed a high mortality risk [American Society of Anesthesiologists (ASA) physical status 4E]. Instead, a conservative treatment plan was initiated, involving bowel rest, intravenous hydration with central venous pressure monitoring, broad-spectrum antibiotics (meropenem and vancomycin), and total parenteral nutrition.

Following initial hemodynamic instability on admission, the patient achieved and maintained hemodynamic stability during the early phase of treatment, with no deterioration observed on physical examination. However, by the third day, he developed melena, and his hemoglobin levels dropped, prompting an urgent endoscopic evaluation. During endoscopy, a necrotic lesion covering a significant portion of the lesser curvature and posterior gastric wall was noted, bordered by hyperemic tissue indicative of healing (Figure 2).

Throughout hospitalization, his inflammatory markers showed improvement and abdominal tenderness resolved. However, on the tenth day, a renewed elevation in CRP levels was observed (Figure 3). He developed respiratory distress, followed by a decline in oxygen saturation. Despite intensive respiratory support, he was diagnosed with hospital-acquired pneumonia, which worsened rapidly, necessitating intubation and mechanical ventilation on day eleven. Unfortunately, the patient succumbed to respiratory failure on the sixteenth day.

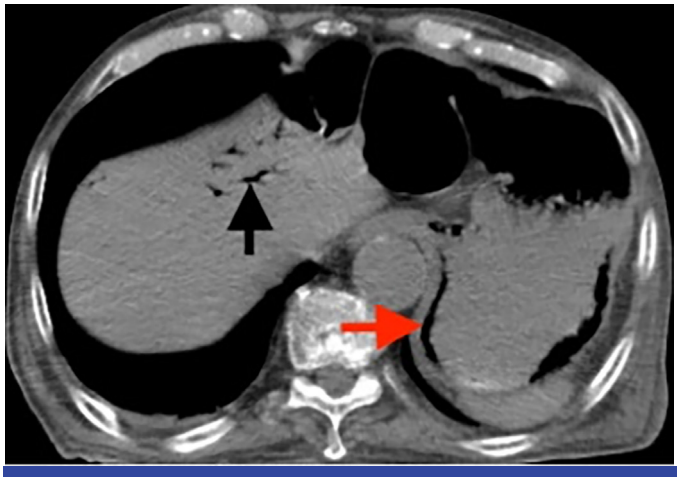

Figure 1. CT image of emphysematous gastritis and air in the portal venosus

(The intramural gas is indicated by a red arrow, and the portal venous gas is indicated by a black arrow)

CT: Computed tomography

DISCUSSION

Emphysematous gastritis, first described by Dr. Frankel in 1889, is a rare but life-threatening gastrointestinal infection characterized by the presence of gas within the stomach wall due to gas-forming organisms such as *Clostridium, Escherichia coli, Streptococcus*, and *Pseudomonas species* [1-3]. Its incidence remains extremely low, with fewer than 100 cases reported in the literature to date [2]. Despite its rarity, the condition carries

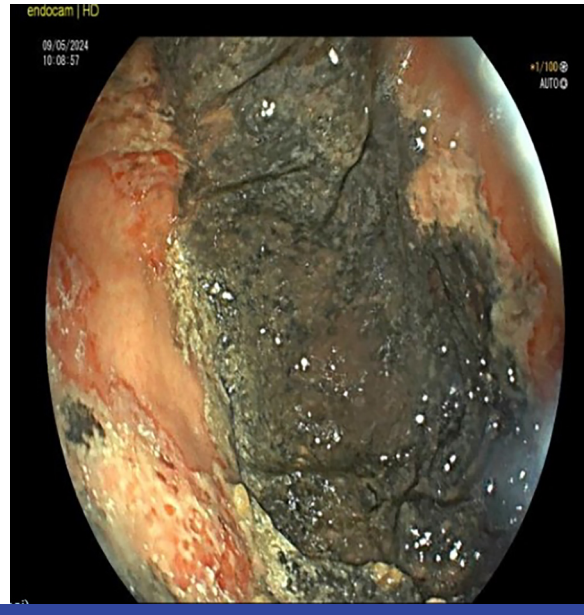

Figure 2. Endoscopic image of patient

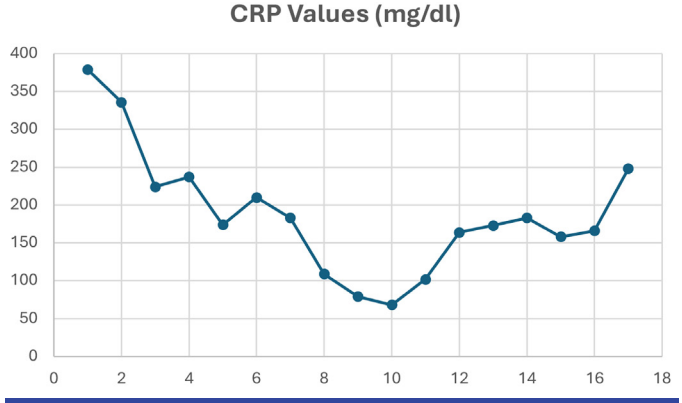

Figure 3. CRP values

CRP: C-reactive protein

a high mortality rate ranging from 55% to nearly 80%, especially in the absence of prompt and appropriate management [4,5].

High-risk populations include elderly individuals, patients with poorly controlled diabetes mellitus, immunosuppressed individuals, and those with chronic organ failure such as renal or cardiac dysfunction [1,4,6]. In our case, the patient was an 88-year-old male with diabetes mellitus, congestive heart failure, and acute kidney injury: multiple risk factors that likely contributed to the onset and poor prognosis.

A critical distinction must be made between emphysematous gastritis and gastric emphysema. While both conditions involve the presence of gas within the gastric wall, gastric emphysema is typically benign, often resulting from non-infectious causes such as instrumentation, vomiting, or trauma, and is not associated with systemic toxicity. Emphysematous gastritis, in contrast, is a fulminant infection with potential for rapid clinical deterioration and sepsis [1,5].

Diagnosis primarily relies on abdominal CT imaging, which typically reveals intramural gastric air and, in some cases, air within the portal venous system-both of which were present in our patient [1,7]. However, the absence of peritoneal signs or overt sepsis at presentation may delay diagnosis in some critically ill or elderly patients, emphasizing the need for clinical vigilance.

Management strategies are not standardized due to the rarity of the disease. In general, treatment includes bowel rest, aggressive intravenous fluid resuscitation, broad-spectrum antibiotics, and nutritional support. Surgical intervention, including total gastrectomy, may be necessary in cases with gastric necrosis, perforation, or clinical deterioration despite conservative measures [6]. In our case, surgery was deemed too high-risk due to the patient's frailty and ASA IV-E status, and a conservative approach was pursued.

When comparing our case to previously reported ones, favorable outcomes have been documented with conservative treatment, particularly in patients without overt perforation or hemodynamic collapse [4,7,8]. For instance, Singhania et al. [4] described successful non-surgical management in a case with similar risk factors. However, other cases, such as the one reported by Liao et al. [6], necessitated early total gastrectomy to achieve survival, underscoring the importance of individualized decision-making. Unfortunately, despite initial stabilization in our patient, subsequent development of hospital-acquired pneumonia led to respiratory failure and death.

This case adds to the growing body of literature suggesting that conservative management can be effective in select high-risk patients. Nonetheless, close monitoring for complications such as bleeding, necrosis, or secondary infections is essential. Further studies are required to determine clinical and imaging predictors of conservative treatment success and to establish evidence-based management protocols.

CONCLUSION

Emphysematous gastritis remains a life-threatening condition requiring prompt recognition and individualized treatment strategies. While surgical intervention may be lifesaving in some cases, conservative management can be an effective alternative in high-risk patients. This case emphasizes the importance of close monitoring and early identification of complications to improve patient outcomes. Given the lack of consensus on optimal management, further studies are warranted to establish clear guidelines for treating emphysematous gastritis.

Ethics

Informed Consent: A written informed consent has been granted from the patient.

Footnotes

Authorship Contributions

Consept: F.K., Desing: A.B.D., Data Collection or Processing: C.A., A.B.D., Analysis or Interpretation: D.K., S.K., Literature Search: F.K., Writing: F.K., A.B.D.

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CASE REPORT

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Solitary Abdominal Wall Tuberculosis: A Rare Complication in a Type 2 Diabetic Patient

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ABSTRACT

Solitary abdominal wall tuberculosis is a rare and often misdiagnosed form of extrapulmonary tuberculosis, primarily due to its non specific clinical presentation. It can mimic neoplastic or pyogenic lesions, leading to frequent misdiagnosis or delayed identification. A high index of suspicion is crucial, especially in patients with risk factors such as immunosuppression, poorly controlled diabetes, or living in endemic areas. We present the case of a 43-year-old man who initially had a chronic, painless abdominal wall mass that later became symptomatic. Pathological examination of the biopsy confirmed a tuberculous granuloma, highlighting the importance of thorough evaluation when encountering atypical soft tissue masses.

Keywords: Abdominal wall, Tuberculosis, Type 2 diabetes

INTRODUCTION

Solitary abdominal wall tuberculosis is rare in patients without a history of pulmonary tuberculosis. We present the case of a 43-year-old male who was admitted with a painless abdominal wall mass that had persisted for 8 years. His lung examination was clear, though he had a history of type 2 diabetes. Surgical pathology ultimately confirmed the mass as a tuberculous granuloma. This case highlights the need to include tuberculosis in the differential diagnosis of chronic soft tissue masses, especially in immunocompromised patients.

CASE REPORT

A 43-year-old male presented with a painless mass in the right lower abdominal wall persisting for 8 years. Routine physical examination showed normal chest computed tomography (CT) findings, while abdominal CT revealed localized swelling of the right external oblique muscle (Figure 1A). No treatment was initiated during this period. One month before admission, the patient developed sudden pain at the site of the lump, without associated redness or swelling, and denied recent fever or weight loss. The patient had an eight-year history of poorly controlled type 2 diabetes, managed with metformin; but denied any history of tuberculosis infection. Physical examination revealed a firm, well-defined, movable lump in the right lower abdomen. Laboratory tests indicated hyperglycemia (Table 1). Abdominal ultrasound identified a hypoechoic mass (4.9×3.2×1.2 cm) in the external oblique muscle of the right upper abdominal wall. Magnetic resonance imaging showed abnormal signals in the right external oblique muscle, extending into the adjacent superficial fascial layer (Figure 1B). Surgical exploration revealed infiltration of inflammatory cells, foamy tissue cell deposition, focal granulation tissue hyperplasia, and microabscess formation in the subcutaneous tissue (Figure 1C). Special staining confirmed the presence of acid-fast bacilli. The diagnosis was tuberculous granuloma of the abdominal

Table 1. Laboratory findings of the patient

Index	Results	Reference range	Unit
White blood cell count	6.59	4.00~10.00	10^9/L
Red blood cell count	5.31	4.00~5.50	10^{12}/L
Hemoglobin	156	120~160	g/L

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Table 1. Continued

Index	Results	Reference range	Unit
Platelet	220	100~300	10^9/L
Neutrophils	48.7	50.0~70.0	%
Lymphocytes	39.5	20.0~40.0	%
Monocytes	9.3	3.0~8.0	%
Eosinophils	1.7	0.0~5.0	%
Basophils	0.8	0.0~1.0	%
Urea	6.69	2.86~8.20	mmol/L
Creatinine	63.1	44.0~110.0	umol/L
Aspartate aminotransferase	26	<38	U/L
Alanine aminotransferase	28	42	U/L
Total protein	62.77	64.00~83.00	g/L
Sodium	136.7	136.0~146.0	mmol/L
Potassium	4.27	3.50~5.10	mmol/L
Calcium	2.3	2.10~2.95	mmol/L
Glucose	12.82	3.89~6.11	mmol/L
Hemoglobin A1c	11.6	4.0~6.0	%
Cancer antigen 125	17.6	<35.00	U/mL
Cancer antigen 199	11.63	<37.00	U/mL
Ferritin	383.4	23.90~336.2	ng/mL
Carcinoembryonic antigen	2.51	<5.00	ng/mL

mmol/L: Millimole per liter, umol/L: Unit mole per liter, U/L: Unit per liter, g/L: Gram per liter, U/mL: Unit per milliliter, ng/mL: Nanogram per milliliter

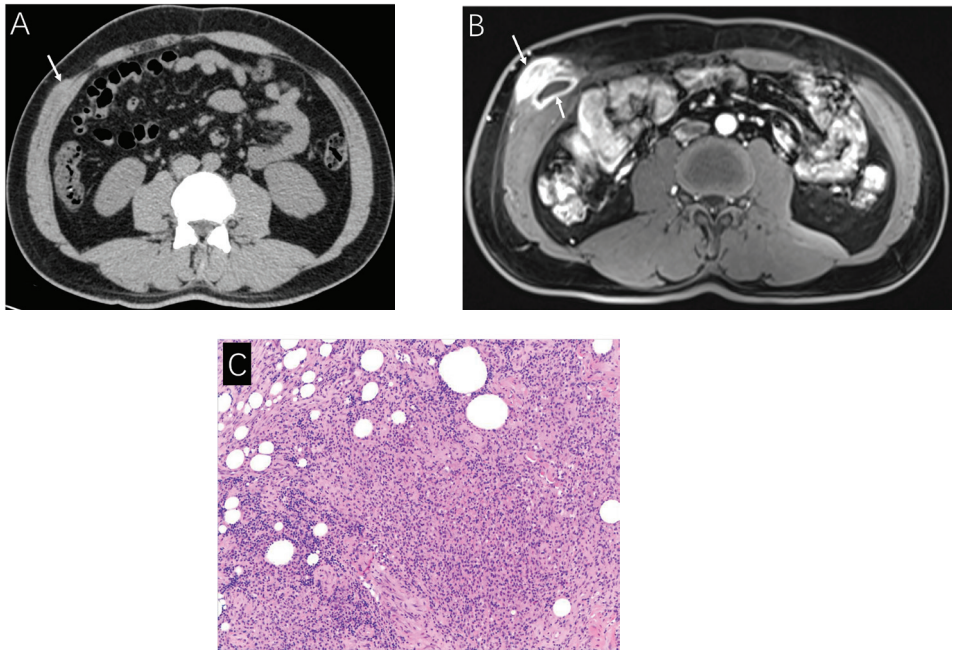

Figure 1. Imaging and pathological results. (A) Abdominal CT showed slight swelling of the right abdominal wall. (B) Post-contrast T1 fat-saturated MRI showed significant enhancement. (C) The pathological results confirmed a tuberculous granuloma.

CT: Computed tomography, MRI: Magnetic resonance imaging

wall. The patient received symptomatic treatment, including anti-infective therapy and blood sugar control. Eleven days after admission, he was transferred to a specialized hospital for anti-tuberculosis treatment.

DISCUSSION

Pulmonary tuberculosis most commonly affects the lungs, while extrapulmonary tuberculosis can involve any organ. Extrapulmonary tuberculosis can occur in both immunocompromised individuals [1] and those with normal immune function [2], comprising about 15% of all tuberculosis cases [3,4]. The most frequent extrapulmonary locations include the pleura, followed by lymph nodes, musculoskeletal system, and urogenital organs [5]. *Mycobacterium tuberculosis* can spread to the abdomen through routes like blood, lymph nodes, or sputum; and abdominal tuberculosis accounts for about 3-4% of tuberculosis cases [6].

Abdominal wall tuberculosis is a rare condition, typically resulting from drainage through the lymphatic system from the ruptured tuberculosis focus, through the peritoneum or adjacent soft tissues. Possible contributing factors include abdominal wall injury, vaccination, or direct spread of tuberculosis from the peritoneum or internal organs [6-8]. Abdominal wall tuberculosis lacks specific clinical symptoms and is typically located on the anterior chest wall. Eighty-three percent of patients have a history of tuberculosis. Nonetheless, literature also reports cases of abdominal wall tuberculosis in immunocompetent individuals [3,5,9], especially in low- and middle-income countries. According to the literature, diabetic patients have a threefold increased risk of contracting pulmonary tuberculosis [10]. Alcala et al. [6] reported a case of a 38-year-old female with type 2 diabetes presenting with a recurrent abdominal wall tuberculosis abscess.

In our case, the patient had no history of tuberculosis infection, and there was no recent trauma or injections. Notably, the patient has a history of type 2 diabetes. Research has indicated that diabetic patients have immune dysfunction, which results in decreased resistance to *Mycobacterium tuberculosis*. High blood glucose levels cause microvascular damage, reducing the effectiveness of tuberculosis treatment and potentially promoting the development of multidrug-resistant tuberculosis. Thus, we speculate that abdominal wall tuberculosis is a rare complication in patients with diabetes. Diagnosing abdominal wall tuberculosis is challenging; a definitive diagnosis is based on pathology. The sensitivity of fine needle aspiration is relatively low, making surgical biopsy the preferred approach. If the lesion becomes purulent, aspiration and local injection of anti-tuberculosis drugs are recommended. If the lesion does not become purulent or aspiration is unsuccessful, surgical resection should be considered [11].

In conclusion, this case emphasizes the importance of considering atypical tuberculous granulomas, particularly in diabetic populations. We suggest optimizing blood glucose control as part of improving the management of tuberculosis in diabetic patients. When evaluating abdominal masses in diabetic patients, especially those with chronic or persistent lesions, clinicians should consider tuberculosis in the differential diagnosis. Early detection through targeted screening, diagnostic imaging, and tissue biopsy may lead to more accurate diagnoses and treatment.

Ethics

Informed Consent: Informed consent was obtained from the patient for publication of this case report, including any accompanying images and data.

Footnotes

Authorship Contributions

Concept: W.Y., C.H., Data Collection or Processing: W.Y., Literature Search: W.Y., C.H., Writing: W.Y., C.H.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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CASE REPORT

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Adenoid Cystic Carcinoma of the Breast: A Rare Salivary Gland-Type Tumor with Favorable Prognosis

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ABSTRACT

Adenoid cystic carcinoma (ACC) of the breast is an exceptionally rare malignancy, accounting for less than 0.1% of all breast cancers. Despite being a subtype of triple-negative breast carcinoma, ACC demonstrates a markedly favorable prognosis, with low rates of axillary lymph node involvement and distant metastasis. Histologically, the tumor is characterized by a dual cell population arranged in cribriform, tubular, or solid patterns. In this report, we present the case of a 65-year-old woman who detected a palpable mass in the upper outer quadrant of her left breast during self-examination. Imaging studies revealed a hypoechoic, spiculated lesion, which was subsequently classified as breast imaging-reporting and data system 4C. Core needle biopsy confirmed the diagnosis of ACC, with immunohistochemistry demonstrating estrogen receptor-negative, progesterone receptor-negative, human epidermal growth factor receptor2-negative status, and positive staining for (sex-determining region y)-related high mobility group -box 10 and cluster of differentiation 117. The patient underwent breast-conserving surgery with sentinel lymph node biopsy, revealing negative nodal involvement. Histopathological examination confirmed ACC with 70% cribriform and 30% solid components, without perineural or lymphovascular invasion. Postoperative management included adjuvant radiotherapy (60 Gy) without chemotherapy. At 12 months post-treatment, no evidence of recurrence was observed. This case highlights the importance of accurate histological and immunohistochemical assessment in establishing the diagnosis and guiding treatment. Given its rarity and generally indolent course, awareness of ACC among clinicians and pathologists is essential to avoid overtreatment and to ensure appropriate surgical and radiotherapeutic management.

Keywords: Adenoid cystic carcinoma, Triple-negative breast cancer, Salivary gland-type tumor, Breast-conserving surgery, Sentinel lymph node biopsy, Immunohistochemistry

INTRODUCTION

Adenoid cystic carcinoma (ACC) is a rare malignant tumor that often involves the salivary gland. Its overall incidence rate is approximately 0.1%. The majority of the cases are female patients aged 50-60 years [1,2]. Its most frequent clinical presentation is a painless palpable mass. It has a highly favorable prognosis, despite being triple negative. Ten-year survival rates range between 85% and 100%. The probability of metastasis to the axilla is extremely low [3-5]. Histologically, it has a dual pattern that consists of myoepithelial cells surrounding pseudocysts and epithelial cells surrounding true glands. Morphologically, it may be solid, cribriform, tubular, or trabecular [2,3,6]. As it is rarely observed, explicit criteria regarding optimal treatment have yet to be established. However, surgery is the most common treatment method implemented in clinical practice [6]. This paper aims to present and discuss ACC of the breast, a very rare breast carcinoma, to raise awareness of this clinical entity.

CASE REPORT

A 65-year-old female patient presented with a lump in the left breast that was detected during a self-breast examination. In the patient's physical examination, a 2 cm hard fixed mass was detected at the outer and upper quadrant of the left breast. No pathological findings were observed in the axillary examination. On mammogram an irregular mass with indictinct margins was detected on the upper outer quadrant of left breast (Figure 1). The breast ultrasonography revealed

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a hypoechoic heterogeneous spiculated mass with posterior acoustic shadowing measuring 17×10 mm in diameter. The lesion was evaluated as breast imaging-reporting and data system (BI-RADS) 4C, due to American College of Radiology -BI-RADS lexicon. Also, magnetic resonance imaging (MRI) was performed and showed an irregular mass, with homogeneous progressive enhancement on post-contrast images and diffusion-weighted imaging (Figure 2). There were no additional remarkable findings on MRI. Ultrasound-guided percutaneous core biopsy was performed. Biopsy revealed a tumor consisting of both solid and cribriform patterns (Figure 3). The immunohistochemical evaluation was reported as estrogen receptor (ER) negative, progesterone receptor (PR) negative, human epidermal growth factor receptor 2 (HER2) negative, Ki-67 (5%). P63 myoepithelial cells were detected as positive in cells with pseudolumen (Figures 4,5). Staining for (sex-determining region y)-related high mobility group -box 10 (SOX10) was expressed as positive in both myoepithelial-like cells and luminal-like cells, while cluster of differentiation 117 (CD117) was expressed as positive in only luminal-like cells (Figure 6).

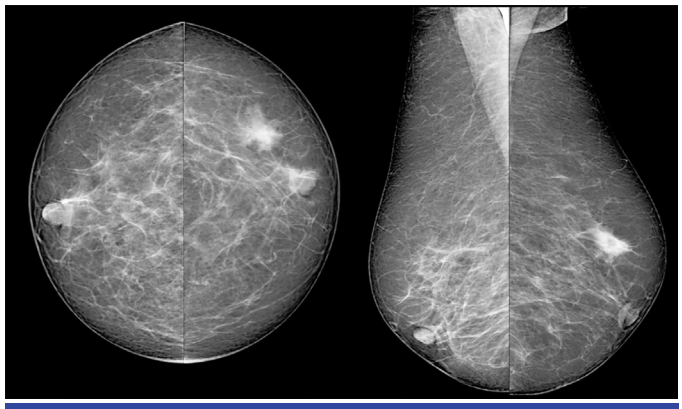

Figure 1. Bilateral mammography shows an irregular mass with indictinct margins in the upper outer quadrant of left breast

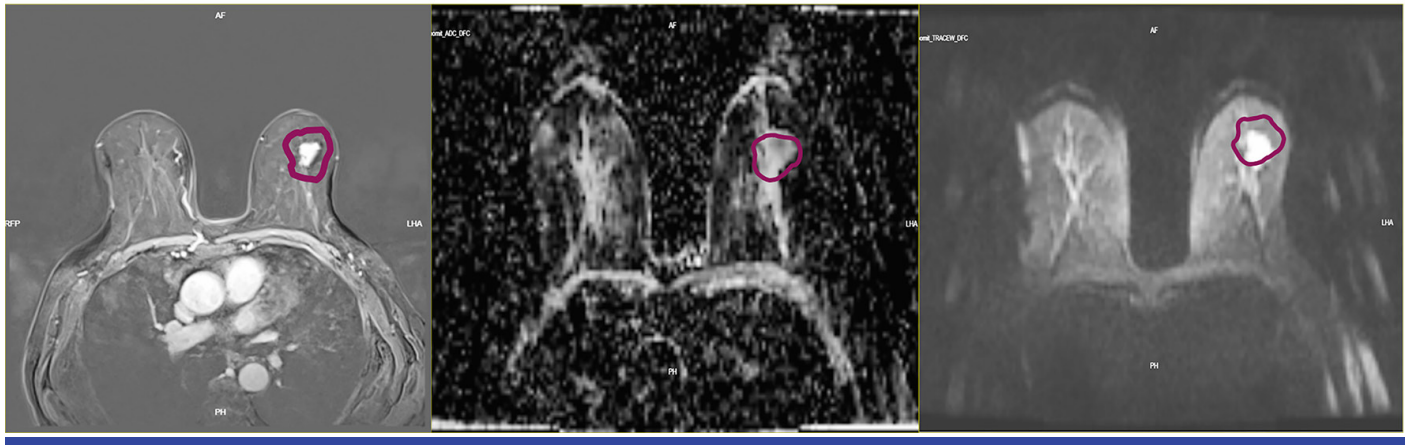

Figure 2. Breast magnetic resonance images demon strates an irregular mass, hyperintense on T2-weighed with homogeneus progressive enhancement on post contrast images and diffusion restriction on diffusion weighted imaging

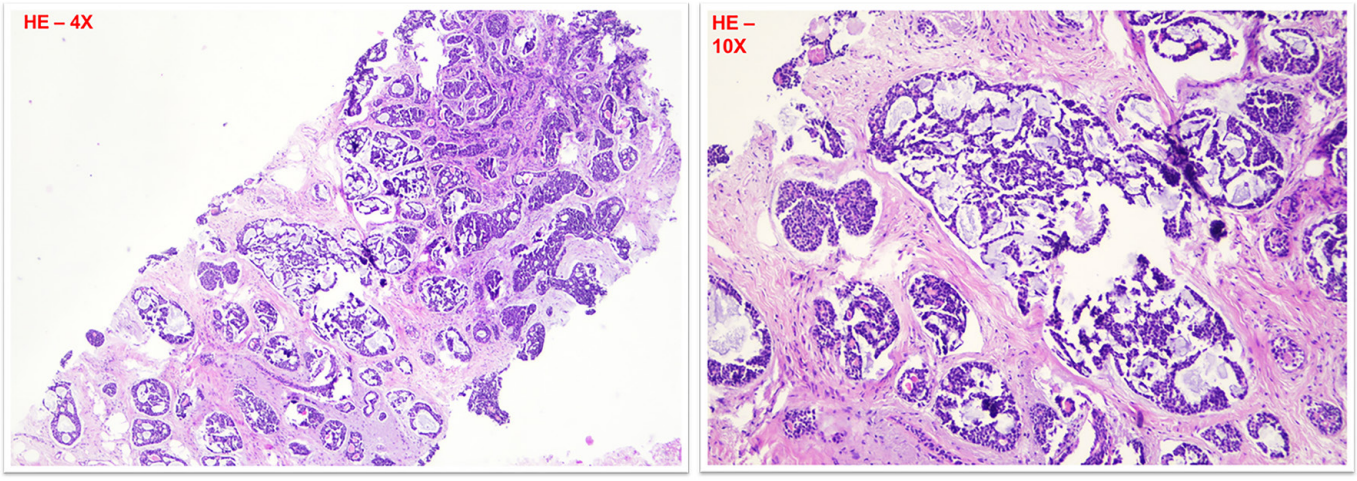

Figure 3. A tumor consisting of both solid and cribriform patterns

The patient underwent breast-conserving surgery with sentinel lymph node biopsy. In frozen evaluation, three sentinel lymph nodes were reported as reactive, and surgical margins were negative. According to the histopathological evaluation, the excision material was reported to be a salivary gland type breast tumor [ER, PR, Cellular erb-B2 (CerbB2) (-), Ki-67: %10(+), SOX10(+), CD117(+), p40(+), 70% cribriform, 30% solid, a tumor diameter of 2.7×2.5×2 cm, without perineural and lymphovascular invasion (-), T2N0, ACC]. Postoperative management consisted of adjuvant radiotherapy (60 Gy). Chemotherapy was not administered, in accordance with the known low-risk biological behavior of ACC.

At 12-month follow-up, the patient remains disease-free with no signs of local or distant recurrence. Good functional and cosmetic results were obtained.

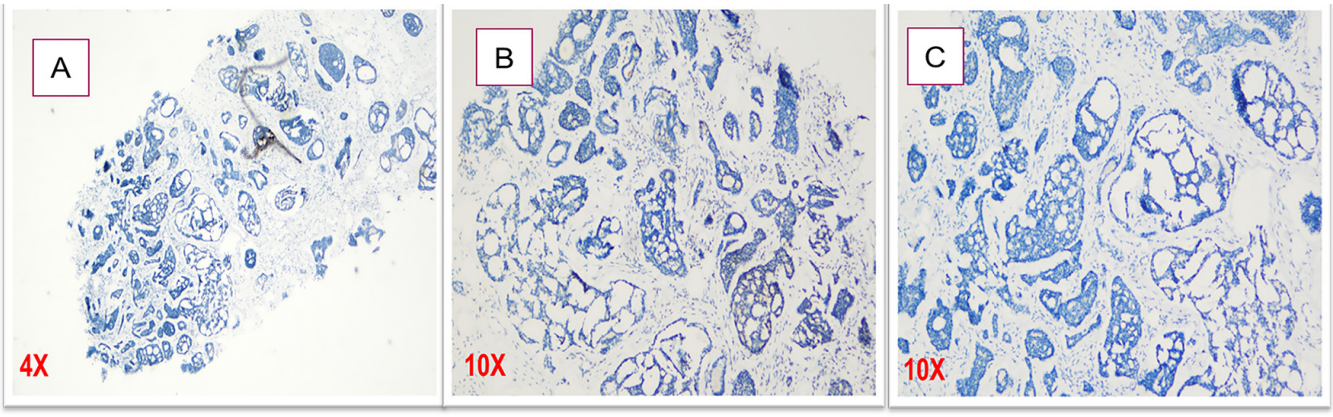

Figure 4. Results of immunohistochemical evaluation [A: ER(-), B: PR(-), C: CerbB2/HER2(-)]

ER: Estrogen receptor, PR: Progesterone receptor negative, HER2: Human epidermal growth factor receptor 2, CerbB2: Cellular erb-B2

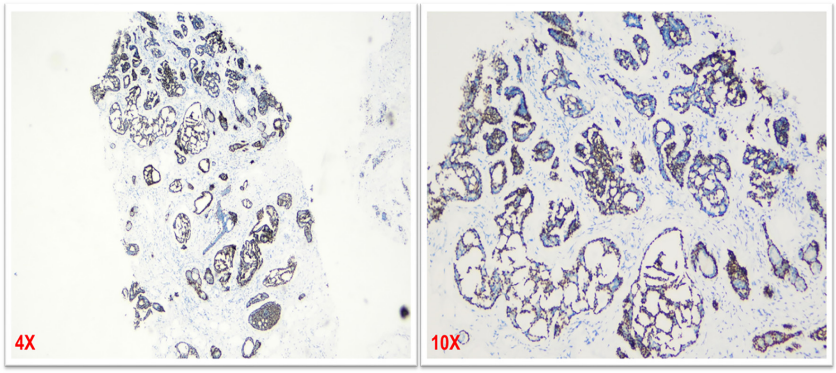

Figure 5. P63 myoepithelial, detected as (+) in cells with pseudolumen

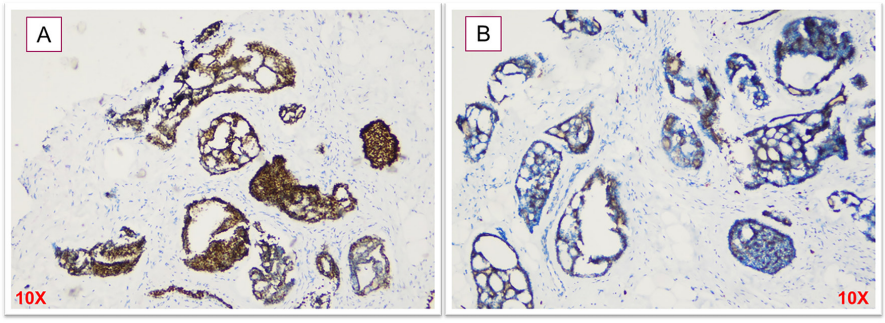

Figure 6. Immunohistochemical stains [A: SOX10 (+), B: CD117 (+)]

SOX10: Staining for (sex-determining region y)-related high mobility group -box 10, CD117: Cluster of differentiation 117

DISCUSSION

ACC is a rare breast tumor that most commonly occurs in patients aged 50-60 years. These patients often present with a painless palpable mass [1-6]. ACC can be detected in various organs such as the salivary glands, cervix, larynx, skin, and lungs [7]. However, the breast stands out because it is among the locations where an occurrence is rarely seen. Mass size usually varies between 1 and 8 cm (mean 3 cm). It is often located in the breast at the periareolar region and upper outer quadrant [3,8]. Our case showed similarities to the data in the literature in that the patient was aged 65 years, and presented with a palpable mass. The tumor was located at the intersection of the retroareolar region and the upper outer quadrant. Cases often exhibit a basal-like phenotype with negative immunohistochemical stains for ER, PR, and HER2. Though it is triple-negative, it has lower rates of distant metastasis, nodal involvement, and local recurrence when totally excised, and thus it differs from other triple-negative breast tumors. Histological variants: Classical variant: The most frequent variant combines three different architectural models (cribriform, tubular, or solid) ranging from low to high nuclear grade. Solid-basaloid variant: It has solid nests, a high mitotic rate, necrosis, Ki67>30%, and a more aggressive clinical course [9,10]. The pathological staging of the tumor is performed based on its solid components. Cases without solid components are classified as stage 1, those with solid components <30% of all tumor areas are classified as stage 2, and those with solid components >30% of all tumor areas are classified as stage 3 [10]. The high pathological stage increases the likelihood of recurrence and distant metastasis and indicates a worse prognosis. In our case, a 70% cribriform and a 30% solid pattern were observed. The gold standard in the treatment is surgery.

Breast-conserving surgery and mastectomy can be preferred as surgical methods due to patients' requests, and lesion features as well. In a 14-patient case series in which long-term survival rates of patients were examined, 10 patients underwent a mastectomy, and three patients underwent breast-conserving surgery. In a similar study in which seven patients were examined, five patients underwent mastectomy, and one patient underwent breast-conserving surgery [6,10]. Triple-negative breast cancers are aggressive types of breast cancer characterized bya poor prognosis and insensitive to hormone therapies due to negative hormone receptors. The preferred treatment method is surgery combined with adjuvant chemotherapy. However, although most ACC cases are triple negative, they have a good prognosis due to their low probability of lymph node involvement and distant metastasis, slow progression, and favorable differentiation in their histological appearance.

ACC of the breast, despite its triple-negative phenotype, exhibits distinct biological behavior with generally favorable outcomes and low responsiveness to chemotherapy. Current literature suggests that adjuvant chemotherapy is not routinely recommended due to the low rates of lymph node involvement and distant metastasis [4,6]. Complete surgical excision with negative margins, often combined with radiotherapy, has been shown to provide excellent local control, reducing the necessity for systemic therapy [5]. In our case, the decision to forgo chemotherapy was based on favorable prognostic features, including complete tumor resection, absence of lymphovascular invasion, and a low proliferative index (Ki-67: 10%). This approach aligns with the indolent nature of ACC and aims to avoid unnecessary treatment-related toxicity while maintaining optimal oncological outcomes.

Although ACC is triple-negative, its clinical behavior contrasts sharply with other triple-negative breast cancers, such as basal-like carcinoma, which are typically aggressive and have a poorer prognosis. This distinction underscores the importance of accurate histological diagnosis to avoid unnecessary aggressive treatments.

CONCLUSION

This case highlights the necessity of a multidisciplinary approach to diagnose and manage rare breast tumors like ACC. Pathologists play a pivotal role in distinguishing ACC from other triple-negative cancers, ensuring patients receive tailored treatments without overtreatment.

Ethics

Informed Consent: The patient's written consent was obtained for the writing and publication of her case, including the publication of images.

Footnotes

Authorship Contributions

Surgical and Medical Practices: C.Y., E.T., F.D., L.T., Concept: C.Y., E.T., F.D., L.T., Design: C.Y., E.T., F.D., L.T., Data Collection or Processing: C.Y., E.T., F.D., L.T., Analysis or Interpretation: C.Y., E.T., F.D., L.T., Literature Search: C.Y., E.T., F.D., L.T., Writing: C.Y., E.T.

Conflict of Interest: No conflict of interest was declared by the authors.

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CASE REPORT

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Using Fasting Glucose and Glycated Hemoglobin in The Determination Prediabetes: A Case Report

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ABSTRACT

Prediabetes (PD) is a serious health condition where glycemic levels are high, but not enough to be diagnosed as diabetes. There are still ambiguities in the diagnosis of PD. Although the borderline between PD and diabetes is recognized by all, to date, we cannot use this phrase for norma/PD. We report on a 55-year-old woman. Her blood tests at the time of admission showed that there was a rise in fasting glucose (115 mg/dL), glycated hemoglobin (41 mmol/mol), and a normal 2-hour glycemic level after a 75 g load oral glucose tolerance test (118 mg/dL). Based on these indicators of carbohydrate metabolism, a PD diagnosis was observed.

Keywords: Prediabetes, Fasting glucose, Glycated hemoglobin, Cut-off point

INTRODUCTION

Diabetes mellitus (DM) is recognized as one of the most significant global health challenges due to both its complications and socio-economic burden [1]. According to the 2021 data from the International Diabetes Federation, an estimated 537 million individuals aged 20-79 worldwide are affected by this disease. Projections indicate that this number will rise to 643 million by 2030 and further increase to 783 million by 2045. Urbanization, an aging population, decreased physical activity, and the rising prevalence of overweight and obesity in recent years are among the key factors contributing to the widespread increase in diabetes in the modern era [2].

Prediabetes (PD) refers to an intermediate stage of dysglycemia along the spectrum from normoglycemia to diabetes. This term is used to identify individuals at risk of developing diabetes; therefore, all diabetes-related complications can potentially be observed in PD [3].

The diagnostic criteria used for DM are being incorrectly applied to PD. Nevertheless, various diabetes organizations have defined non-uniform criteria for PD. The World Health Organization (WHO) characterizes PD as a condition of intermediate hyperglycemia, based on two specific measures: fasting glucose (FG) (110-125 mg/dL) and GL120 (140-199 mg/dL) [4]. Conversely, the American Diabetes Association (ADA), applies the same cut-off point for 2-hour plasma glucose (GL120) but adopts a lower cut-off for FG (100-125 mg/dL) and additionally includes HbA1c criteria, defining PD as a level of HbA1c that is 5.7-6.4% [5].

This case report details diagnosing of PD, which be helped to reduce risk of developing DM.

CASE REPORT

A 55-year-old woman was referred to the Azerbaijan Association of Endocrinology, Diabetology and Therapeutic Education (AAEDTE). The patient was asymptomatic, a nonsmoker, had no chronic disease, and was not on medications. The patient had a family history of DM, hypertension, and dyslipidemia. On the first visit, physical examinations revealed blood pressure of 110/90 mmHg, heart rate of 78/min, respiratory rate of 20/min, and the lungs were clear. She was 147 cm tall and weighed 71 kg, with a body mass index indicating obesity of 32.8 kg/m^2. Her waist circumference was 97 cm. Laboratory examination results showed FG levels 115 mg/dL, HbA1c level 5.9% (41 mmol/mol), 2-hour glycemic level after 75 g glucose loading, 118 mg/dL, HOMA IR index 2.5, raised low-density lipoprotein levels (220 mg/dL), normal high-density lipoprotein levels (61 mg/dL), and high triglyceride

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levels (150 mg/dL). Urea, creatinine, and liver function tests were normal.

We conducted the study to evaluate carbohydrate metabolism in accordance with the AAEDTE Standards proposed for discussion, assessing the patient's carbohydrate metabolism following these standards (Table 1).

Based on these standards, she had impaired fasting glucose, with an FG level ≥110 mg/dL (115 mg/dL) elevated HbA1c, with an HbA1c level ≥5.7 (5.9%), and normal oral glucose tolerance test. According to the criteria defining PD in nonpregnant individuals, one prediabetic result can confirm the diagnosis of PD/ADA.

DISCUSSION

PD is associated with an increased risk of diabetes, cardiovascular events, and mortality. Each year, 5-10% of individuals with PD progress to diabetes [4]. Therefore, early detection, accurate diagnosis, and effective management of PD can reduce the risk of complications and mortality [3]. According to the recommendations of the ADA, this patient meets two diagnostic criteria for PD: FG (115 mg/dL) and HbA1c (5.9%). However, based on the WHO guidelines, PD can be confirmed using FG (115 mg/dL). Nevertheless, to date, the WHO does not recommend the use of HbA1c in the determination of PD. On the other hand, according to the guidelines of the Canadian and Australian Diabetes Societies, the prediabetic range for HbA1c is defined as 6.0%-6.4% [6,7].

In our study, we first examined the relationship between diagnostic criteria. The correlation coefficient (r) was +0.63 (95% confidence interval (CI) +0.516; +0.722) between FG and HbA1c, and +0.61 [95% CI +0.492; +0.706] between FG and GL120. Accordingly, all three diagnostic criteria were applied in establishing the diagnosis of PD. Therefore, we calculated the diagnostic "cut-off" point for FG and HbA1c in PD using multiple linear regression equations [8,9].

FG=-4.2439+0.1927*GL120+15.462*HbA1c

HbA1C=12.3514+2.2549*FG+1.5751*GL120

According to the recommendations of the AAEDTE, all three diagnostic criteria are suggested for detecting PD.

Table 1. Diagnostic criteria for NGM, DM and PD according to AAEDTE [6]

Parameters	Units	NGM	PD	DM
HbA1c	%	≤ 5.6	5.7-6.4	≥6.5
	mmol/mol	≤38	39-47	≥48
FG	mg/dL	<110	110-125	≥126
	mmol/L	<6.1	6.1-6.9	≥7.0
2-hour OGTT	mg/dL	≤139	140-199	≥200
	mmol/L	≤7.7	7.8-11.0	≥11.1

NGM: Normal glucose metabolism, DM: Diabetes mellitus, PD: Prediabetes, AAEDTE: Azerbaijan Association of Endocrinology, Diabetology and Therapeutic Education, OGTT: Oral glucose tolerance test

Ethics

Informed Consent: Informed consent was obtained from the patient for publication of this case report, including any accompanying images and data.

Footnotes

Financial Disclosure: The authors declared that this study received no financial support.

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