

## Complete Pathological Response in a Young Patient with Poorly Differentiated Gastric Adenocarcinoma Following FLOT Neoadjuvant Chemotherapy: A Case Report

Hajri Amal<sup>1</sup>, Jamaledine Khalid<sup>2</sup>, El Kabbaj Abderrahmane<sup>3</sup>, Elwassi Anas, Erguibi Driss<sup>4</sup>, Boufettal Rachid<sup>5</sup>, Rifki Jai Saad<sup>6</sup>, Chehab Farid<sup>7</sup>

<sup>1,2,3,4,5,6,7</sup>Surgical Department of Cancerology and Liver Transplantation "Aile 3", University Hospital Center Ibn Rochd, Hassan II University, Casablanca, Morocco.

**ABSTRACT:** Gastric cancer remains a significant health issue, particularly when occurring in younger populations with more aggressive forms and poorer outcomes. Here, we present the case of a 24-year-old female diagnosed with poorly differentiated gastric adenocarcinoma. She presented with severe epigastric pain, progressive dysphagia, hyper salivation, melena, and significant weight loss. Diagnostic evaluations revealed a subcardial mass suggestive of Borrmann type III gastric cancer. Following a multidisciplinary decision, neoadjuvant chemotherapy with the FLOT regimen was initiated, resulting in a 10% reduction in tumor size. The patient underwent spleen-preserving total gastrectomy with Roux-en-Y reconstruction and extensive lymph node dissection. Postoperative pathology showed no residual neoplasm or lymph node metastasis. This case highlights the importance of a multimodal approach, demonstrating the efficacy of the FLOT regimen in achieving a complete pathological response and underscores the potential for favorable outcomes even in rare and aggressive cases of gastric cancer.

**KEYWORDS:** Gastric Cancer, Young Adult, FLOT Regimen, Complete Pathological Response.

### 1. INTRODUCTION

Gastric cancer remains a significant global health issue, ranking as the fifth most common malignancy and the third leading cause of cancer-related mortality worldwide [1]. Despite advances in diagnostic and therapeutic strategies, the prognosis for gastric cancer remains poor, particularly when diagnosed at advanced stages. The disease predominantly affects older adults, but its occurrence in younger populations, though rare, is often associated with more aggressive forms and worse outcomes [2].

The management of gastric cancer has evolved with the introduction of multimodal treatment approaches, combining surgery, chemotherapy, and sometimes radiation [3]. Neoadjuvant chemotherapy, in particular, has revolutionized the treatment landscape for locally advanced gastric cancer, improving resectability and survival outcomes by reducing tumor size and eliminating micrometastases. The FLOT regimen (5-fluorouracil, leucovorin, oxaliplatin, and docetaxel) has emerged as a leading therapeutic approach for locally advanced gastric cancer, demonstrating superior efficacy compared to older regimens [4].

Surgical resection remains the cornerstone of curative treatment for localized gastric cancer. The decision to proceed with surgical resection in gastric cancer patients is a critical component of treatment planning. Furthermore, the extent of resection and lymph node dissection is determined by tumor location, stage, and the patient's overall health. Achieving negative surgical margins and thorough lymphadenectomy are essential for reducing recurrence risk and improving survival outcomes. Multidisciplinary care teams play a critical role in providing personalized treatment plans, which are vital for addressing the complex nature of this disease [3].

In this context, we present the case of a 24-year-old female diagnosed with a poorly differentiated gastric adenocarcinoma who achieved complete pathological response (pCR) after undergoing neoadjuvant chemotherapy with the FLOT regimen, followed by surgery.

### 2. AIM OF THE ARTICLE

The aim of this article is to report a rare case of a poorly differentiated gastric adenocarcinoma in a 24-year-old female, detailing its clinical presentation, diagnostic process, management, and surgical outcome. Additionally, this study aims to contribute to the existing literature on gastric cancer in young adults, emphasizing the effectiveness of the FLOT regimen as neoadjuvant

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chemotherapy and the importance of a multidisciplinary approach in optimizing patient outcomes. Through this case report, we seek to improve the understanding and management of aggressive gastric cancer in younger populations.

### 3. CASE PRESENTATION

A 24-year-old female presented with severe epigastric pain, progressive solid food dysphagia, hypersalivation, episodes of melena, significant weight loss, and general health deterioration over one month. Her medical history was unremarkable with no smoking or alcohol consumption and no significant family history of cancer. Childhood medical history included adenoidectomy at the age of 5.

The patient's symptoms prompted an upper gastrointestinal endoscopy which revealed an irregular subcardial mass at the greater curvature of the stomach, heavily bleeding upon biopsy, suggestive of a Borrmann type III gastric cancer. Pathological examination from biopsy indicated a poorly differentiated adenocarcinoma, with immunohistochemical profile CK+, CK7+, CK20-, CK5/6-, P63-, infiltrating the lamina propria of the esophagus.

Thoracic and abdominal computed tomography (CT) scan showed a 43x37 mm wall thickening located at the lesser curvature of the upper gastric body. No signs of locoregional or distant extension were noted, though peritoneal effusion was present in the left paracolic gutter. According to these findings, a preoperative diagnosis of T2, N0, M0 was made.



Figure 1: Computed tomography findings prior to chemotherapy.



Figure 2: Post chemotherapy computed tomography findings.

The tumor markers were within normal levels, showing CEA at 1.80 ng/ml and CA 19-9 at 8.3 UI/ml. Following a multidisciplinary team decision, staging laparoscopy was performed, revealing neither peritoneal seeding nor hepatic nodules, however a small amount of peritoneal effusion was found. Cytological examination of the effusion showed clusters of large cells with high nucleus-to-cytoplasm ratio and hyperchromatic nuclei, which were suspected to be malignant. Consequently, preoperative chemotherapy was initiated consisting of the FLOT regimen.

Follow-up imaging showed a 10% reduction in tumor size from 43x37 mm to 33x25 mm, qualifying as stable disease according to the Response Evaluation Criteria in Solid Tumors (RECIST)[5].

The patient consequently successfully underwent surgical resection by spleen-preserving total gastrectomy with Roux-en-Y reconstruction and extensive lymph node dissection. Postoperative pathology showed no residual neoplasm and all dissected lymph nodes (27 in total) were free from metastasis.

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**Figure 3: Total Gastrectomy Specimen with modified radical lymphadenectomy (D1.5)**

The patient's postoperative recovery was uneventful, and she was referred to the Department of Oncology to continue with four additional cycles of FLOT chemotherapy. Subsequent follow-ups and imaging studies confirmed the absence of disease recurrence.

#### 4. DISCUSSION

The management of gastric cancer in young adults presents unique challenges due to the rarity[6] and often aggressive nature of the disease[7]. In many cases, gastric cancer in young patients is diagnosed at an advanced stage, often manifesting with severe symptoms[8], [9]. Early detection remains pivotal, and there is a need for heightened awareness of atypical presentations in this demographic[10]. This study describes the rare case of a 24-year-old woman with a poorly differentiated gastric adenocarcinoma that demonstrated a remarkable response to neoadjuvant FLOT chemotherapy, resulting in a pCR.

Our treatment approach aligns with current evidence supporting the benefits of neoadjuvant chemotherapy for locally advanced gastric cancer[3]. In Western countries, the standard regimen for resectable gastric and gastroesophageal junction cancers typically involves a combination of neoadjuvant and adjuvant chemotherapy with 5-fluorouracil, leucovorin, oxaliplatin, and docetaxel (FLOT), followed by surgical resection[11], [12], [13]. This protocol has been shown to improve survival rates and reduce recurrence compared to older chemotherapy regimens[3], [4]. As demonstrated by a pivotal trial published in *The Lancet Oncology* in 2019 that found that patients treated with the FLOT regimen had significantly higher overall survival rates than those receiving the ECF/ECX regimen (epirubicin, cisplatin, and fluorouracil/capecitabine)[14]. In our case, the FLOT regimen effectively reduced the tumor burden, enabling successful surgical resection. Postoperative pathology revealed no residual neoplasm and no lymph node metastasis, highlighting the effectiveness of this multimodal therapy in achieving favorable outcomes even in cases with adverse histological features.

Comparatively, cases documented in the literature reveal that achieving a complete response by these various chemotherapeutic regimens is still considered a rare phenomenon, occurring in rates of 2.2-15% according to institutional studies and meta-analyses for gastroesophageal cancer[15], [16], [17]. However, in some cases, successful responses with neoadjuvant chemotherapy followed by surgical intervention have been achieved. For instance, Tada et al. reported a complete pathological response in a patient with advanced gastric cancer following S-1 and cisplatin chemotherapy[18]. Furthermore, Endo et al. described a case of synchronous gastric and lung cancer achieving complete response with nivolumab and subsequent surgical management[19]. These cases illustrate the evolving role of chemotherapy in transforming unresectable gastric cancer into operable disease.

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Surgery following chemotherapy is often regarded as more complex due to the effects of chemotherapy which may involve increased blood loss, fibrotic changes, and adhesions to nearby organs[20]. However, previous studies have shown that the rate of complications is not significantly greater than that observed in patients undergoing standard radical surgery for gastric cancer[21], [22], [23], [24], which aligns with our case where there were no postoperative complications.

In terms of the survival benefit, several studies identified pCR as a predictor of overall survival of patients with gastric cancer[16], [25]. Cho et al. demonstrated overall survival and recurrence-free survival rates at 3 and 5 years of 96% and 85% and 91% and 75%, respectively[26].

On the other hand, larger studies have been unable to support this claim. Several hypotheses have been proposed to explain this divergence[27]. One suggestion is that pCR might only reflect the primary tumor's response to the treatment, whereas the impact on micro-metastatic disease could be more significant.

This case contributes to the growing body of evidence supporting the efficacy of aggressive multimodal treatment approaches in achieving long-term disease-free survival.

## 5. CONCLUSION

We encountered a rare case of a 24 year old woman with gastric cancer, where the successful use of the FLOT regimen as neoadjuvant chemotherapy led to a complete pathological response and an uneventful recovery post-surgery. This case highlights the potential for favorable outcomes in even rare and aggressive cases, emphasizing the importance of tailored therapeutic strategies and thorough follow-up in optimizing patient prognosis.

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