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Case Report

Open Witzel feeding jejunostomy for enteral nutrition in a patient with gastric linitis plastica and Bombay blood group: a case report

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ABSTRACT

To present a rare case of advanced gastric linitis plastica with malignant ascites and the Bombay (hh) blood group, managed successfully with open Witzel feeding jejunostomy for palliative nutritional support and facilitation of systemic chemotherapy. A 42-year-old female presented with progressive abdominal distension, early satiety, nausea, and weight loss. Clinical evaluation revealed severe malnutrition, ascites, and gastric outlet obstruction. Endoscopy and biopsy confirmed signet ring cell carcinoma (diffuse type). Due to the presence of gross ascites and the rare Bombay blood group, open Witzel feeding jejunostomy was selected over laparoscopic techniques for safe enteral access. The procedure was performed under intravenous sedation via an upper midline laparotomy. The postoperative course was uneventful. Enteral feeding through the jejunostomy tube was initiated on postoperative day one and supplemented with oral feeding by day five. The patient showed improved nutritional tolerance and was started on Capecitabine chemotherapy under palliative intent. No early postoperative or transfusion-related complications were reported. Open Witzel feeding jejunostomy is an effective and safe approach for enteral nutritional support in advanced gastric cancer cases with contraindications to laparoscopy. In patients with rare blood groups such as Bombay (hh), open techniques provide better intraoperative control and transfusion preparedness, supporting individualized surgical decision-making in complex oncologic care.

Keywords: Jejunostomy, Enteral nutrition, Palliative care, Stomach neoplasms, Signet ring cell carcinoma

INTRODUCTION

Gastric cancer is a notable global health concern currently positioned as the fifth most commonly diagnosed malignancy and the third most common cause of death related to cancer globally.[1] Among its histologic subtypes, signet ring cell carcinoma, classified under the diffuse type in Lauren's classification, is known for its aggressive clinical behaviour, including early transmural infiltration, peritoneal dissemination, and poor prognosis.[2,3] Linitis plastica, a characteristic radiological and endoscopic finding of diffuse-type gastric cancer often results in luminal narrowing and loss of gastric distensibility, leading to symptoms such as early satiety, abdominal distension, and weight loss. These features, coupled with delayed presentation, frequently necessitate palliative interventions rather than curative resection.

Maintaining adequate nutritional support is paramount in the multidisciplinary care of gastric cancer patients, particularly those with gastric outlet obstruction or significant disease burden. Enteral feeding, when feasible, is the preferred route over parenteral nutrition, given its association with better preservation of gut integrity and reduced infectious complications.[4] Feeding jejunostomy, especially via the Witzel technique, provides a safe and effective method of delivering long-term enteral nutrition in such patients. The technique was first introduced by Dr. Otto Witzel in 1891, who described the placement of a feeding tube into the jejunum, tunneled subserosally and

fixed with a serosal flap to prevent leakage and promote durability.[4-6]

Over time, this approach has undergone various refinements, including modifications in tube materials, tunneling length, and anchoring methods, yet the core principles of the original technique remain widely practiced due to their proven efficacy and simplicity.[5-7] Although laparoscopic approaches are increasingly utilized due to their minimally invasive advantages including reduced postoperative pain and faster recovery, open feeding jejunostomy remains essential in certain clinical settings such as advanced malignancy with gross ascites, poor performance status, or distorted intra-abdominal anatomy.[8,9]

Studies have reported the effectiveness of laparoscopic jejunostomy in patients with advanced gastric cancer requiring nutritional support prior to systemic therapy.[10] However, in cases where laparoscopy is not feasible, open jejunostomy continues to be a viable and often necessary alternative. The Japanese Gastric Cancer Treatment Guidelines also emphasize the importance of nutritional interventions as part of comprehensive cancer care, particularly in patients undergoing chemotherapy or those with impaired oral intake.[11]

In this report, we describe the case of a middle-aged woman diagnosed with diffuse-type signet ring cell carcinoma of the stomach presenting with malignant ascites, gastric outlet obstruction, and severe malnutrition. As part of palliative care and to facilitate enteral feeding before systemic chemotherapy, an open Witzel feeding jejunostomy was performed, with favorable short-term outcomes.

CASE REPORT

A 42-year-old female patient visited the outpatient department with a two-month history of worsening abdominal swelling. The patient was symptom-free before this onset, with symptoms developing slowly and worsening over time. The clinical presentation includes dyspepsia, persistent nausea, early satiety, and a notable loss of appetite, which has resulted in unintentional weight loss. She was a known case of hypothyroidism for the past 15 years, although she was not on any regular thyroid hormone replacement therapy. Additionally, she had received treatment for anemia one year earlier. There was no relevant family history of malignancy or gastrointestinal disease, and no psychosocial or genetic risk factors were identified.

On general examination, the patient appeared poorly nourished with a BMI of 15. She was tachypneic and pale, with bilateral pedal edema. There was no icterus, cyanosis, clubbing, or lymphadenopathy. Her abdomen was distended, shiny, and full in the flanks, with mild epigastric tenderness. No surgical scars or sinuses were noted, bowel sounds were sluggish, and stool staining was present on digital rectal examination. Based on her clinical condition, laboratory investigations were performed and revealed serum sodium of 134 mmol/l, potassium 3.8 mmol/l, chloride 104 mmol/l, bicarbonate 25 mmol/l, and a WBC count of 8290/mm³. Tumor markers were elevated, with CEA at 6.84 ng/ml and CA-125 at 282.8 U/ml. Her blood group was identified as Bombay (hh), which presented a unique consideration during planning.

Imaging studies showed diffuse circumferential thickening of the gastric wall with a maximum thickness of 7.2 mm and poor gastric distensibility. A friable growth involving the entire stomach caused narrowing of the pyloroduodenal outlet. Upper GI endoscopy raised suspicion of gastric carcinoma, with features consistent with linitis plastica. Further evaluation with contrast-enhanced CT scans revealed mild gastric wall thickening, bilateral adnexal lesions, moderate to gross ascites, and mild bilateral pleural effusion without nodular opacities. A biopsy taken during endoscopy confirmed the diagnosis of poorly differentiated adenocarcinoma, signet-ring cell type (diffuse type).

Histopathological examination revealed diffusely infiltrating malignant cells within the gastric stroma, along with characteristic signet ring cells containing intracytoplasmic mucin displacing the nucleus peripherally (Figure 1 and 2).

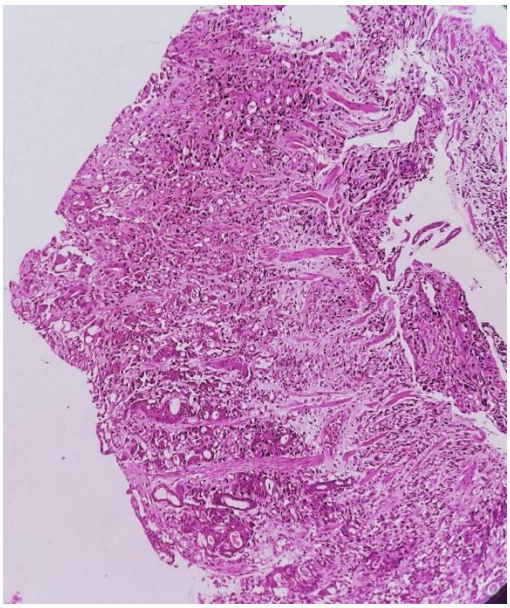

Figure 1: Infiltrating malignant cells in the gastric stroma.

There were no major delays in diagnosis, though the presence of ascites and rare blood group status required logistical planning. The final diagnosis was poorly differentiated adenocarcinoma of the stomach, signet ring cell type (linitis plastica), with secondary complications including severe malnutrition and untreated hypothyroidism. Given the advanced stage of disease,

gastric outlet obstruction, and poor nutritional status, the patient was planned for open Witzel feeding jejunostomy as a palliative measure to ensure enteral nutritional support. Under intravenous sedation, an upper midline laparotomy was performed. A 16 French Ryle's tube was placed 39 cm distal to the duodenojejunal flexure at the antimesenteric border of the jejunum. It was secured with a purse-string suture and tunneled subserosally over a 5 cm segment, with the proximal portion anchored to the parietal peritoneum. Tube patency was confirmed using a saline push test. Intraoperative findings included gross ascites and thickened stomach wall, with no visible peritoneal deposits. The postoperative course was uneventful. The patient received IV antibiotics, PPIs, analgesics, fluids, and supportive care. Enteral feeding via the jejunostomy was initiated on postoperative day one, and oral feeds were resumed by postoperative day five. She also received 20% human albumin infusion for hypoalbuminemia.

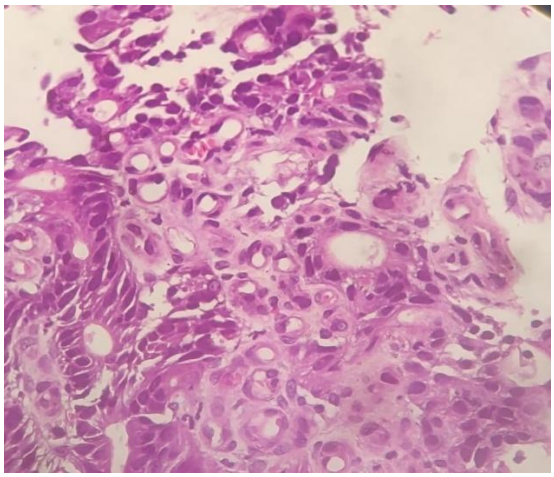

Figure 2: Signet ring cells with mucin pushing the nucleus to the periphery.

Figure 3: Witzel feeding jejunostomy.

At discharge, the patient was clinically stable and tolerating feeds through both oral and jejunostomy routes. On follow-up, medical oncology consultation was obtained, and she was initiated on oral Capecitabine chemotherapy under palliative intent. There were no early postoperative complications. The patient adhered well to nutritional and chemotherapy regimens, with improved tolerance to diet and no reported adverse events in the immediate follow-up period.

DISCUSSION

Gastric cancer remains a major global health burden, with over one million new cases and approximately 770,000 deaths annually, ranking as the fifth most common malignancy and the third leading cause of cancer-related mortality worldwide.[1] Among the histological subtypes, signet ring cell carcinoma, part of the diffuse type as per Lauren's classification, is known for its aggressive nature, submucosal spread, and poor prognosis due to late-stage detection.[2,3]

In patients with linitis plastica, circumferential thickening of the gastric wall leads to gastric outlet obstruction, impaired distensibility, and nutritional decline. The clinical picture often includes nausea, early satiety, abdominal distension, and progressive weight loss, necessitating timely nutritional support. As described in the Japanese Gastric Cancer Treatment Guidelines (5th edition), early integration of nutritional strategies is a cornerstone in managing patients with advanced gastric cancer, especially those undergoing chemotherapy or palliative treatment.[11]

Malnutrition is a modifiable risk factor in cancer management. It significantly affects treatment response, wound healing, and quality of life. Guidelines from the European Society for Clinical Nutrition and Metabolism (ESPEN) recommend early enteral nutrition for surgical patients when oral intake is not feasible, noting that it is superior to parenteral nutrition in maintaining gut integrity and reducing postoperative infections.[13]

In patients with obstructive gastric cancer, feeding jejunostomy offers a direct method to initiate enteral nutrition. The open Witzel technique, involving subserosal tunneling and secure fixation, remains a reliable option when laparoscopic access is technically limited, such as in cases with ascites or distorted anatomy. While laparoscopic methods have grown in popularity for their minimally invasive advantages, open techniques are particularly valuable in palliative and complex presentations.[8-10]

A major strength in the management of this case was the early recognition of nutritional compromise and prompt surgical intervention using open Witzel feeding jejunostomy, which enabled enteral feeding and timely initiation of chemotherapy. The choice of the open approach, rather than laparoscopic, was based on the

patient's clinical complexity, including gross ascites and the presence of the rare Bombay blood group, allowing for greater intraoperative control and safety. One limitation of this approach was the inability to utilize a minimally invasive technique, which may be beneficial in less complicated settings. Additionally, long-term nutritional outcomes and response to chemotherapy could not be fully assessed within the scope of the current follow-up.

Evidence from a large retrospective study by Sun et al. supports the use of feeding jejunostomy in gastric cancer. In a cohort of 2,980 patients, including 715 who underwent feeding jejunostomy during resection, no significant increase in postoperative morbidity or mortality was observed, and nutritional markers improved significantly.[12]

Another critical consideration was identifying the Bombay (hh) blood group, a rare phenotype lacking the H antigen and producing strong anti H antibodies. This necessitated meticulous perioperative and transfusion planning to avoid potentially fatal hemolytic reactions. Despite no transfusion being required, this caution was justified by documented cases in the literature. For instance, Shahshahani et al. reported a patient whose Bombay phenotype was misdiagnosed as group O; upon receiving incompatible blood, the individual developed an acute hemolytic transfusion reaction, highlighting the importance of accurate blood typing and cross-matching.[14] Given the presence of gross ascites and the rare blood group status, which demanded heightened transfusion readiness and intraoperative vigilance, the open Witzel feeding jejunostomy approach was preferred over laparoscopy to allow direct visualization, rapid hemostasis if required, and enhanced safety in a setting where blood product availability was critically limited.

The decision to perform an open Witzel feeding jejunostomy allowed for early enteral nutrition, which was initiated on postoperative day one and supplemented oral feeding by day five. This enabled the initiation of palliative chemotherapy (Capecitabine), demonstrating that such surgical interventions can play a critical supportive role in the multidisciplinary management of advanced gastric cancer.

CONCLUSION

This case highlights the importance of timely nutritional intervention in patients with advanced gastric cancer presenting with gastric outlet obstruction and severe malnutrition. Open Witzel feeding jejunostomy proved to be a practical and safe method for delivering enteral nutrition in a patient with complex clinical features, including gross ascites and the rare Bombay blood group. Early initiation of enteral feeds not only improved the patient's nutritional status but also enabled the initiation of systemic chemotherapy. This case underscores that open feeding jejunostomy remains a valuable option in selected patients where minimally invasive techniques may be contraindicated, and it reinforces the critical role of multidisciplinary planning in optimizing outcomes in palliative oncology care.

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