Nutritional Management in a Patient with Breast Cancer Metastasis to the Stomach: a Case Report

Manejo Nutricional em Paciente com Metástase Gástrica de Câncer de Mama: um Relato de Caso
Manejo Nutricional en Paciente con Metástasis Gástrica del Cáncer de Mama: un Informe de Caso

Larissa Calixto Lima¹; Aline Pereira Pedrosa²; Fernanda de Oliveira Pereira³; Tairara Scopel Poltronieri⁴

Abstract

Introduction: It is uncommon for breast cancer to metastasize to the stomach. However, when it does occur, nutritional support is indispensable, because gastric tumors are associated with nutritional complications, which worsen clinical outcomes. Case report: We report the case of a female patient diagnosed with breast adenocarcinoma that had metastasized to the bones, ovaries, and stomach, who was hospitalized because of clinical complications. During hospitalization, she presented severe weight loss and was classified as being at nutritional risk, as determined by the Patient-Generated Subjective Global Assessment. Due to severe odynophagia, oral intake was not possible. Therefore, after consultation with the multidisciplinary team, the decision was made to insert a nasogastric tube. Conclusion: Nutritional therapy in patients with advanced cancer still constitutes a dilemma facing professionals and needs to be discussed by a multidisciplinary team, the participation of the nutritionist, patient, and family being indispensable. Therefore, health care services must be prepared to manage nutritional therapy correctly, in order to promote better quality of life for such patients.

Key words: Breast Neoplasms; Neoplasm Metastasis; Nutrition Therapy.

Resumen

Introducción: El surgimiento de metástasis gástrica proveniente de neoplasia de mama es raro. Sin embargo, el soporte nutricional en estos casos es imprescindible, ya que los tumores gástricos están relacionados a complicaciones nutricionales, favoreciendo los resultados clínicos negativos. Informe de caso: Paciente con diagnóstico de adenocarcinoma de mama, con progresión para huesos, ovario y estómago, internada debido a complicaciones clínicas. Se presentó una pérdida de peso grave durante la internación, además de diagnóstico de riesgo de desnutrición por la evaluación subjetiva global producida por el paciente. Debido a un cuadro de odinofagia severa, la alimentación oral se volvió imposibilitada, siendo optado por el uso de sonda nasoenterica después de la discusión con el equipo interdisciplinario. Conclusión: La terapia nutricional en pacientes con cáncer avanzado sigue siendo un dilema entre los profesionales y su ejecución debe ser discutida y decidida por un equipo interdisciplinario, con participación indispensable del nutricionista, del paciente y de sus familiares. Para ello, los servicios de salud deben estar preparados para el correcto manejo de la conducta nutricional, a fin de promover calidad de vida para estos pacientes.

Palabras clave: Neoplasias de la Mama; Metástasis de la Neoplasia; Terapia Nutricional.

¹ Nutritionist. Master’s in Nutrition from the Nutrition Institute of the Universidade do Estado do Rio de Janeiro (Uerj). Hospital do Câncer IV (HC IV). Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA). Rio de Janeiro (RJ), Brazil. E-mail: larissa.lima@inca.gov.br.
² Nutritionist. Bachelor’s in Nutrition from Universidade Federal do Rio de Janeiro (UFRJ). Student in the Multidisciplinary Oncology Residency Program of the INCA. Rio de Janeiro (RJ), Brazil. E-mail: alinepp.nut@gmail.com.
³ Nutritionist. Bachelor’s in Nutrition from Universidade Federal do Rio de Janeiro (Unirio). Student in the Multidisciplinary Oncology Residency Program of the INCA. Rio de Janeiro (RJ), Brazil. E-mail: feoliveirananda@gmail.com.
⁴ Nutritionist. Bachelor’s in Nutrition from the Centro Universitário de Serra Gaúcha (FSG). Student in the Multidisciplinary Oncology Residency Program of the INCA. Rio de Janeiro (RJ), Brazil. E-mail: tairara.poltronieri@hotmail.com.

Address for correspondence: Larissa Calixto Lima. E-mail: larissa.lima@inca.gov.br.

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INTRODUCTION

Cancer is characterized by disordered cell growth and, in some cases, metastasis to distant tissues and organs. According to the Instituto Nacional de Cáncer José Alencar Gomes da Silva (INCA, José Alencar Gomes da Silva National Cancer Institute), breast neoplasms constitute the most common cancer, with the highest incidence and mortality, among women worldwide.

Metastatic breast tumors typically migrate to the bone, lung, liver, brain, and lymph nodes. However, new treatments are prolonging survival, making it necessary to be attentive in order to identify progression at previously unexpected sites.

According to the literature, the incidence of breast cancer metastasis to the stomach is ≤1%. Such metastasis, when present, is almost always diagnosed in more advanced stages, at which time treatments capable of modifying the course of the disease lose effectiveness and palliative care becomes more important. Therefore, ending therapy aimed at a curative approach does not mean the end of an active treatment, rather reflecting a change in the focus of the intervention, the main purpose of which is to reduce suffering and improve quality of life for the patients and their families. In palliative care, professionals should base their decisions on the preferences and expectations of patients and their families, as well as on careful evaluation of the prognosis and survival. An appropriate evaluation leads to improved treatment strategies, informs the planning of care, and promotes the efficient use of available resources, helping minimize the risks of undertreatment and excessive or futile treatment.

In this context, various nutritional evaluation measures have been used as prognostic markers in patients with advanced tumors, because malnourished individuals are at higher risk of adverse clinical outcomes than are those who are well nourished. A nutritional intervention is essential and has different objectives according to the clinical procedures to which the patient will be submitted, being capable of controlling symptoms, increasing functionality and improving quality of life, even through the resignification of food, making it possible to reduce anxiety and increase pleasure. Therefore, the objective of the present study was to report the nutritional management performed in a patient diagnosed with advanced breast cancer with metastasis to the stomach.

This was a descriptive case report on the nutritional care of a patient diagnosed with breast cancer that had metastasized to the stomach. The patient was treated at INCA Cancer Hospital III, a referral center for the treatment of breast cancer, in the city of Rio de Janeiro, Brazil. The study was approved by the Research Ethics Committee of INCA Cancer Hospital III (Reference no. 2,563,495; CAAE no. 83451518.5.0000.5274).

Nutritional status was evaluated according to the INCA Cancer Hospital III nutritional assessment protocol, which is composed of the Patient-Generated Subjective Global Assessment (PG-SGA), anthropometric measurements, and determination of biochemical parameters.

The PG-SGA was applied during the first 24 h after hospital admission by a previously trained evaluator. The PG-SGA, which was validated for use in Brazil by Gonzalez et al., evaluates nutritional status based on a combination of factors such as weight loss, changes in food intake, gastrointestinal symptoms, functional changes, and changes seen on physical examination. Through the use of the PG-SGA, nutritional status is classified, subjectively, as follows: well nourished (category A); moderately malnourished or at nutritional risk (category B); or severely malnourished (category C).

The anthropometric parameters measured included weight, height, triceps skinfold thickness (TST), arm circumference (AC), and arm muscle circumference (AMC). Weight (in kilograms) was measured with a scale built into a bed (Stryker Corp., Kalamazoo, MI, USA), which had a maximum capacity of 228 kg and an accuracy of 0.1 kg. Height (in meters) was reported by the patient at admission and confirmed by reviewing previous entries in the medical record. Body mass index (BMI) was determined by calculating the weight/height ratio and classified according to the cut-off points proposed by the World Health Organization (WHO). The significance of weight loss was classified according to the system devised by Blackburn et al., which takes into consideration the period over which the weight was lost and the proportional reduction.

The TST was determined with a Lange skinfold caliper (TBW; Cambridge Scientific Industries, Inc., Cambridge, MD, USA). The measurement was taken on the posterior face of the dominant arm, specifically at the midpoint between the scapula acromion and the ulna olecranon. For the measurement, the adipose tissue was lifted slightly away from the muscle tissue and pinched with the caliper at a right angle exactly at the marked location. During the evaluation, the arm remained relaxed, hanging loosely at the side of the body.

The AC was measured on the dominant arm, at the same midpoint used to measure the TST, with a cloth (non-elastic) tape measure. To obtain the AC, the participant kept the arm relaxed, allowing the tape to circumscribe the marked point, in an adjusted manner, without compressing the skin. The AMC was obtained using the equation proposed by Gurney & Jelliffe, which...
uses the AC and TST. The nutritional status was classified by comparing the measured values for AC, AMC, and TST with the National Health and Nutrition Examination Survey international reference values (50th percentile), as shown in the percentile table devised by Frisancho12,13.

The biochemical parameters evaluated were complete blood count, C-reactive protein (CRP) and albumin. On the basis of the CRP and albumin values, we calculated the Glasgow Prognostic Score (GPS)14: a GPS of 2 is assigned when the concentrations of CRP and albumin are <3.5 g/dL and >10 mg/L, respectively (indicating a worse prognosis); a GPS of 1 is assigned when they are ≥3.5 g/dL and >10 mg/L, respectively; and a GPS of 0 is assigned when the CRP concentration is ≤10 mg/L.

CASE REPORT

We report the case of a 54-year-old White married female who had type II diabetes mellitus and hypertension, which were being treated with human insulin (as needed depending on the level of glycemia) and propranolol hydrochloride, respectively. She was diagnosed with invasive lobular adenocarcinoma (ILA) of the left breast, which was categorized as stage IV (with progression to the bones, ovary, and stomach), as grade II (testing positive [>67%] for estrogen and progesterone receptors), and as negative for human epidermal growth factor receptor 2, with Ki-67 expression <14%. She underwent radiotherapy, in four fractions because of spinal cord compression syndrome, and was treated with tamoxifen for 30 days. The patient underwent esophagogastroduodenoscopy with biopsy of the lesions found in the stomach two in the greater curvature of the proximal antrum and one in the posterior wall of the stomach. The biopsy confirmed gastric adenocarcinoma, as metastasis from the primary tumor in the breast. The immunohistochemical study revealed positivity for CK7 and for the estrogen receptor. The tumor marker findings included pronounced elevation of the carcinoembryonic antigen level (to 170.50 ng/mL), as well as a cancer antigen 125 level of 396.40 u/mL and a cancer antigen 15.3 level of 994.50 u/mL.

Because of dehydration, respiratory infection, and oral candidiasis, the patient required hospitalization. At hospital admission, nutritional screening was performed with the PG-SGA. On the basis of her PG-SGA score (19 points), the patient was classified as moderately malnourished or at nutritional risk (PG-SGA category B), indicating a critical need for improvement in the management of symptoms or options for nutritional intervention.

In the anthropometric evaluation, also performed at admission, the patient had a weight of 74.5 kg, a height of 1.57 cm, and a BMI indicative of class I obesity (30.2 kg/m²). In addition, the TST, AC, and AMC were appropriate (AC and TST between the 50th and 75th percentile; and AMC between the 25th and 50th percentile). The patient reported having weighed 80 kg one month before the PG-SGA and having lost 2.5 kg (3.2%) over a ten-day period (Table 1).

At seven days after admission, another nutritional evaluation was carried out. At that time, the patient weighed 72.4 kg, with a BMI indicative of overweight (29.4 kg/m²). The patient lost 2.7% of her body weight over a one-week period, such weight loss being categorized as severe15. She presented severe weight loss in all nutritional assessments performed during hospitalization, with a total weight loss in one month of 9.4% (Figure 1).

The patient reported gastrointestinal symptoms: odynophagia, dysphagia, dry mouth, and intestinal constipation. Laboratory tests showed hypoalbuminemia, thrombocytopenia, and anemia, although renal and hepatic function were found to be preserved. The relationship between serum levels of CRP and albumin resulted in a GPS of 0 (Table 1).

According to Fearon et al.15, the patient in question could be classified as pre-cachectic, because she presented significant weight loss, loss of appetite, and metabolic alterations, as evidenced by the results of the complete blood count and determination of albumin levels. Taking into account the gastrointestinal changes and associated comorbidities, we initially prescribed an oral diet consisting of soft foods, in six meals per day. The diet was normocaloric, high-protein, low-sodium, free of mucosal irritants, and restricted in simple carbohydrates; contained a laxative;
Table 1. Comparison between the anthropometric and biochemical values obtained at admission and those obtained in the final nutritional evaluation of a breast cancer patient diagnosed with metastasis to the stomach

<table>
<thead>
<tr>
<th>Anthropometric parameters</th>
<th>Admission (07/06/2017)</th>
<th>Final assessment (07/14/2017)</th>
<th>Classification</th>
<th>Reference/reference value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>74.5</td>
<td>72.5</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Height (m)</td>
<td>1.57</td>
<td>1.57</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>BMI (kg/m2)</td>
<td>30.2</td>
<td>29.4</td>
<td>Overweight</td>
<td>WHO9</td>
</tr>
<tr>
<td>Weight loss (%)</td>
<td>N/A</td>
<td>2.7% in one week</td>
<td>Severe weight loss</td>
<td>Blackburn et al.10</td>
</tr>
<tr>
<td>AC (cm)</td>
<td>N/A</td>
<td>31.9 (50th-75th percentile)</td>
<td>Appropriate</td>
<td>Frisancho13</td>
</tr>
<tr>
<td>TST (mm)</td>
<td>N/A</td>
<td>28.0 (50th-75th percentile)</td>
<td>Appropriate</td>
<td>Frisancho13</td>
</tr>
<tr>
<td>AMC (cm)</td>
<td>N/A</td>
<td>22.2 (25th-50th percentile)</td>
<td>Appropriate</td>
<td>Frisancho12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biochemical parameters</th>
<th>Admission (07/06/2017)</th>
<th>Final assessment (07/14/2017)</th>
<th>Classification</th>
<th>Reference/reference value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematocrit (%)</td>
<td>38.5</td>
<td>25.9</td>
<td>Low</td>
<td>36-47*</td>
</tr>
<tr>
<td>Hemoglobin (g/dL)</td>
<td>13.0</td>
<td>8.50</td>
<td>Low</td>
<td>11.5-16.4*</td>
</tr>
<tr>
<td>Leukocytes (cells/µL)</td>
<td>6,900</td>
<td>5,200</td>
<td>Normal</td>
<td>4,000-10,000*</td>
</tr>
<tr>
<td>Platelets (k/µL)</td>
<td>140</td>
<td>93</td>
<td>Low</td>
<td>150-400*</td>
</tr>
<tr>
<td>CRP (mg/L)</td>
<td>Not requested</td>
<td>8.64</td>
<td>High</td>
<td>&lt;0.5*</td>
</tr>
<tr>
<td>Albumin (g/dL)</td>
<td>3.4</td>
<td>2.4</td>
<td>Low</td>
<td>3.5-5.2*</td>
</tr>
<tr>
<td>GPS</td>
<td>N/A</td>
<td>0</td>
<td>Low risk</td>
<td>McMillian14</td>
</tr>
</tbody>
</table>

BMI: body mass index; N/A: not applicable; AC: arm circumference; TST: triceps skinfold thickness; AMC: arm muscle circumference; GPS: Glasgow Prognostic Score.

*Reference values/ranges adopted by the laboratory of INCA Cancer Hospital III.

and was augmented with hypercaloric and hyperproteic oral nutritional supplements, once daily. In accordance with the INCA recommendations for weight maintenance in patients with severe stress14, the estimated daily energy requirement was 2,000 kcal (25 kcal/kg) and the estimated daily protein requirement was 120 g (1.5 g/kg).

Acceptance of the oral diet was partial. During hospitalization, the patient developed intense pain in the thoracic region (esophagus), causing odynophagia, which further reduced the level of acceptance of the oral diet offered. At that time, we opted to insert a nasogastric tube to initiate hypercaloric, high-protein, sucrose-free, low-sodium enteral nutrition, via a closed system, at an initial drip of 25 mL/h, supplying a total of 750 kcal/day (37.5% of the daily energy need). On the following day, the drip rate was increased to 50 mL/h, with a total supply of 1,500 kcal/day (75% of the daily energy need). On the third day of enteral nutrition, the patient died from multiple organ failure.

DISCUSSION

Breast cancer metastasis to the stomach is difficult to diagnose because the clinical signs are generally nonspecific, non-existent, or masked by the side effects of treatment of the primary tumor4. One example is treatment with an oral hormone (such as tamoxifen), which can have gastrointestinal side effects16. Therefore, women with metastatic breast cancer metastasis to the stomach have a worse prognosis4.

Invasive ductal carcinoma is the most common type of breast cancer17. However, it is less likely to metastasize to the gastrointestinal tract than is ILA19.

According to the PG-SGA, the patient was at nutritional risk, despite the fact that her BMI was indicative of class I obesity. The PG-SGA is considered the gold standard for nutritional assessment in cancer patients, because it has high sensitivity and specificity in such patients19. Therefore, although the BMI is not indicative of malnutrition, weight loss in cancer patients per se is already considered to be of concern, because it increases the rate of complications and decreases survival20. These data underscore the fact that an appropriate nutritional evaluation (i.e., one that is more precise and accurate) should be composed of the greatest possible number of parameters, such as those obtained through anthropometric measurements, laboratory tests, and functional examinations of the patient, together with the subjective evaluation of the professional20.

In the context of breast cancer metastasis to the stomach, it is imperative to consider the possibility of cachexia, which is a multifactorial syndrome characterized by progressive and involuntary reduction of body and muscle weight, with or without fat loss, together with increased protein catabolism, as well as greater morbidity and mortality17. Cachexia is common in patients with advanced cancer, affecting their performance and quality of life, and is associated with worse treatment responses. The international consensus defining and classifying cancer-induced cachexia divides the syndrome into
three phases: a pre-cachectic state, in which there is weight loss of up to 5%, accompanied by anorexia and metabolic alterations; cachexia, in which there is greater loss of weight/muscle mass and the patient develops systemic inflammation; and the final phase of the wasting syndrome, refractory cachexia, which is characterized by intense catabolism and nonresponsiveness to antitumor therapy, with low patient functionality and a life expectancy of less than three months.

Given that systemic inflammation is characteristic of cancer patients, prognostic scores can be used to assess this condition, one such score being the GPS, which has proved to be effective in this population. The patient described here had a GPS of 0, which is indicative of a better prognosis. This score uses a CRP cut-off point of $\geq 10 \text{ mL/dL}$. However, some authors have suggested that CRP cut-off points as low as $7.5 \text{ mg/L}$ or even $3.0 \text{ mg/L}$ are associated with worse clinical outcomes.

Nutritional intervention is essential in cancer patients, especially in cases of tumor metastasis to the stomach, which leads to innumerable dysfunctions related to food intake and nutrition. In the case presented here, the patient remained lucid and well oriented until the end of her life. She also had a very attentive companion, who was constantly concerned with her feeding process, particularly when oral feeding became impossible. Therefore, the choice of enteral feeding route was discussed by the multidisciplinary team, within the context of a patient who could not swallow, because she had severe odynophagia.

In patients with advanced cancer, the decision to initiate enteral or parenteral nutrition should take into account individual clinical and prognostic aspects, especially the expectations of patients and their families, because the desires and needs of the patient and caregivers should be paramount at that stage. However, since death is not a probabilistic event, its exact time can not be described with 100% certainty by the prognostic factors. Therefore, different health care professionals can behave differently in relation to identical cases.

**CONCLUSION**

Metastasis to the stomach is a rare occurrence in patients with breast cancer. However, health care facilities should be prepared for the correct management of nutritional behavior in such cases, with the objectives of promoting quality of life – particularly through proper control of symptoms – and avoiding the worsening of nutritional status, treatment discontinuity, and premature death.

The PG-SGA and anthropometry (more specifically, weight loss), are important tools that can be used in order to diagnose malnutrition. The GPS can also be used as an important prognostic measure. However, it is the clinical and specialized perspective that provides the best approach by the team as a whole, which is of great relevance for the care of patients with advanced cancer. Therefore, given that the administration of nutritional therapy in patients with advanced cancer still represents a dilemma among professionals, its execution must be discussed and decided by a multidisciplinary team, the participation of the nutritionist, the patient, and their families being indispensable.

**AUTHOR CONTRIBUTIONS**

Aline Pereira Pedrosa, Fernanda de Oliveira Pereira, and Taíara Scopel Poltronieri conceived and planned the study; collected, analyzed, and interpreted the data; drafted and revised the manuscript; and approved the final version for submission. Larissa Calixto Lima collected, analyzed, and interpreted the data; drafted and revised the manuscript; and approved the final version for submission.

**DECLARATION OF CONFLICTS OF INTEREST**

Nothing to Declare.

**REFERENCES**


