Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v30i19.3699

"KRUKENBERG TUMOR, CASE REPORT"

Michelle Karolina Montalván Cordero[1*], Andrea Catalina Ochoa Bravo[2], Dr Christian Gabriel Villa Clavijo[3]

[1*]Universidad Catolica de Cuenca, michellemontalvan21@gmail.com, https://orcid.org /0009-0003-1841-2974
[2]Especialista En Medicina Interna, En La Universidad De Cuenca, acojan@ucacue.edu.ec, Docente Universidad Católica de Cuenca, correo: https://orcid.org/ 0000-00023890- SO90?lang=en
[3]Universidad Catolica de Cuenca, Oncologo Hospital Centro de investigaciones Rusas de Radioterapia en Cáncer, christian.villa@ucacue.edu.ec, https://orcid.org/0000-0003-2757-9748, *Cuenca- Ecuador*

***Corresponding Author:** Michelle Karolina Montalván Cordero
*****Universidad Catolica de Cuenca, michellemontalvan21@gmail.com, https://orcid.org /0009-0003-1841-2974

Abstract
Krukenberg tumor, known as a metastatic ovarian malignancy, constitutes approximately 5% to 15% of ovarian malignancies and is associated with an unfavorable prognosis. Its prevalence varies among populations, with higher incidence rates observed in regions with a high prevalence of gastric carcinoma, such as Japan, where Krukenberg tumors represent up to 17.8% of all ovarian carcinomas. The general objective of this study was to describe the therapeutic approach employed in a clinical case, and the specific objectives focused on identifying the diagnostic scheme, clinical manifestations, and initial comorbidities presented by the patient. The methodology used encompassed a descriptive research approach, involving the collection of data provided by the AS400 system at José Carrasco Arteaga Hospital in the city of Cuenca. In this specific case study related to Krukenberg tumor, the patient, a 24-year-old woman with a history of ovarian cyst diagnosed two years ago and treated with oral contraceptives, which were discontinued by medical decision six months ago, sought medical attention due to long-lasting colicky abdominal pain that worsened over the last three months. Ultrasound examinations revealed a solid pelvic mass and fluid in the pelvic cavity. Subsequent surgery identified the presence of ascitic fluid, enlarged ovaries, multiple tumor implants, and metastatic nodules in different areas, indicating metastasis from gastric carcinoma, i.e., a Krukenberg tumor.

Keywords: Krukenberg tumor, ovarian malignancy, gastric carcinoma, diagnosis, clinical manifestations.

Introduction

Understanding and management of Krukenberg tumor, a type of ovarian metastatic tumor, represents a significant challenge in the field of gynecologic oncology, this rare malignant tumor, which constitutes approximately 5 to 15% of malignant ovarian tumors, is characterized by its gloomy prognosis and its association with specific malignancies in other parts of the body (1). Its frequency of occurrence varies according to the population studied, being more prevalent in regions with a high

incidence of gastric carcinoma, such as Japan, where it can represent up to 17.8% of all ovarian carcinomas, however, in the general population, its incidence is extremely low, ranging between 1% and 2% of ovarian tumors (1).

This tumor owes its name to the German physician Friedrich Ernst Krukenberg, who in 1896 first described this neoplastic entity, identifying five cases in patients with ovarian malignancies. Years of subsequent research revealed that Krukenberg's tumor presents as an ovarian metastasis secondary to specific carcinomas, primarily signet ring cell carcinomas, most of which originate in the gastrointestinal tract (2,3).

This term has also been applied to metastatic tumors originating in adenocarcinomas in other locations, one of which is most frequently in the colon, where there is an increase in embryonic carcinogenic antigen and specific findings for immunohistochemical analysis (4). Tumors are usually bilateral; Although it is not complete, it can occur in more than 80% of all cases and, given its metastatic nature, it is considered to have a very poor prognosis (2). Clinically, patients may be asymptomatic or present with non-specific symptoms depending on the involvement of the tumor, that is, symptoms such as abdominal pain or distension, non-specific gastrointestinal symptoms, or ascites with malignant cells may manifest (5,6).

Since the symptoms in this type of neoplasm are usually non-specific, the support of complementary examinations is needed; such as imaging studies, among them the most useful continues to be the computed tomography, although it can guide us to a diagnostic suspicion, the diagnosis cannot be assured until the biopsy is performed; however, histopathological analysis should be investigated for the presence of other tumors that may mimic it (1,7). Even with the continuous medical advances that occur every day, his prognosis remains very bleak. The only hope lies in preventive measures and improving patients' quality of life (7).

It is worth mentioning that Krukenberg tumor is a metastatic tumor of epithelial lineage that infiltrates the ovarian stroma, they are tumors with signet ring cells that lack tubular formation; Therefore, it is essential to distinguish them from ovarian tumors that contain signet ring cells with mucinous or non-mucinous material. This type of Krukenberg tumour has an incidence that corresponds to about 1-2% of all ovarian tumours. (2). On the other hand, the most frequent location of the primary tumor may originate at the level of the stomach and, secondly, in the colon. This is an extremely rare cancer, as has been attributed to several described bibliographies with an uncertain prognosis, so the risk of mortality is very high, in addition to the prolonged hospital stay and continuous admissions, patients have a very poor survival (3-10 months) and only 10% of patients survive more than 2 years from diagnosis (2,8).

In most cases, the stomach has been attributed as the primary site; However, there have been several studies that show this in about 70% of cases. Recent sources indicate an increasing prevalence of colorectal tumors (9,10). Gastric and colorectal tumors together account for nearly 90% of the primary site of this tumor. Other less common primary sites that have also been described in the literature are the breast, appendix, small intestine, gallbladder, urinary bladder, bile ducts, pancreas, ampulla of Vater or cervix (11,12). Recurrences can occur years after the primary tumor has been treated (9).

Regarding epidemiology, it is important to emphasize that the average age to reach a diagnosis is 35 to 45 years old. However; The possibility that it can be seen in all age groups should not be ruled out. Of all diagnosed ovarian malignancies, Krukenburg tumors in Western countries account for less than 4% of these tumors. The incidence is higher in Asian countries such as Korea, Japan, and China, where these tumors account for about 20% of all ovarian cancers (9). It is believed that the high prevalence of gastric cancer may be related to its predominance in these areas.

The exact mechanism of tumor spread, even with several studies, is inconclusive. But it is believed that the tumor spreads through one of three mechanisms: the lymphatic system, the hematogenous system, and the transcoelomic pathway (9). The hematogenous and lymphatic pathway means that the tumor can spread through blood vessels or lymphatic channels. As for the transcoelomic route, this refers to the fact that the actual cancer cells spread directly through the abdominal route directly

to adjacent organs. However, the lymphatic route is privileged over the vascular route and, finally, the peritoneal pathway. The average age at diagnosis correlates with increased vascularization of the ovaries, supporting the hypothesis of lymphatic and hematogenous spread (13,14,15).

Although the symptomatology is non-specific, there are certain symptoms that guide the diagnosis of this pathology: ascites, typically a late feature of peritoneal metastases, can occur along with intestinal obstruction and cachexia. These tumors can move, leading to ovarian torsion and abdominal pain.

Nevertheless; it should be supported by multiple complementary examinations that give a higher diagnostic suspicion, for which studies are performed that include imaging, including computed tomography (CT) or ultrasound of the abdomen and pelvis. These tumors usually appear as bilateral ovarian masses and usually appear solid, but they can also be cystic. The preoperative serum CA-125 level may rise and fall after tumor resection (9).

An effective treatment strategy for these tumors has not been established, as there is no complete cure. Radiation and chemotherapy offer minimal improvement in the overall prognosis. The options available for the treatment of this neoplasm are cytoreductive surgery (CRS), as well as adjuvant chemotherapy (CT), neoadjuvant QT and hyperthermic intraperitoneal chemotherapy (HIPEC). These treatments can be used alone, or in combination (16). The mainstay of therapy remains the surgical reaction with an R0 result, R0 is defined as a microscopically negative resection margin in which no macroscopic or microscopic tumor is found at the surgical site (17).

Given the metastatic nature of the disease, this neoplasm can substantially affect the quality of life of patients who suffer from it, the only thing surgery can achieve is palliation, patients generally have an average life span of 2 years, with a median survival of 14 months reported in the literature. Although the therapeutic scheme currently used has been shown to be useful in improving quality of life, it is not effective in the long term since there are a number of adverse effects that hinder patients' therapeutic adherence (9).

Despite continued medical advances, the grim prognosis of patients with Krukenberg's tumor has led to a focus on preventive measures and improving the quality of life of those affected. The general objective of this study is to describe Krukenberg tumor and its metastatic origin in relation to other malignancies, while the specific objectives include analyzing the clinical manifestations and comorbidities in patients diagnosed in early stages, evaluating the diagnostic and therapeutic scheme in a particular clinical case, and comparing the clinical case with the intervention of authors in similar cases. To address these objectives, the hypothesis is built on the importance of therapeutic design in specific clinical cases of Krukenberg tumor for the survival and quality of life of patients.

Methods

In this work, a descriptive research will be carried out, through the collection of data provided by the AS400 system, of the José Carrasco Arteaga Hospital in the city of Cuenca, where all the information pertinent to the clinical case will be obtained, in which it is intended to evaluate from the first instance, the case in a general way and each of the links that had to be taken to reach the diagnosis and treatment in the case of the patient. In the same way, it is proposed to collect data in bibliographic sources, which serve to compare the therapeutic scheme used in the case of the patient and the one used by other authors to reach a diagnosis. For this reason, several articles obtained from a search carried out in different types of digital databases such as: PubMed, Science Direct, Elseiver and Scopus will be reviewed.

Search Strategy

To complement the present research. Keywords were used in bibliographic search engines such as "KRUKENBERG TUMOR", "OVARIAN TUMORS", "KRUKENBERG TUMOR SYMPTOMS". In the selection of articles, limiters such as the type of document are used, only articles related to the area of human medicine, most of the articles on which it was based With those published at least 5 years ago; However, it is important to emphasize that there are also previously published studies that have relevant information, so it should also be cited.

Inclusion criteria

- Case reports in female patients between 20-45 years old
- Published in indexed journals
- Woman with signs and symptoms pertaining to krukenberg tumor

Exclusion Criteria

- Studies that have not been conducted on humans
- Studies published more than 10 years ago
- Publications that do not mention symptoms of krukenberg tumor Language
- For the realization of this work, articles published in English and Spanish were largely used, if there is relevant information, but being in another language will be supported by translators that allow a better understanding of the subject

Ethical Considerations

The present work is descriptive, so it requires information to obtain the patient's medical history; Therefore, the permission of the institution is obtained for academic purposes and the authorization of the patient, however, the identity of the patient will not be revealed, nor data that entails violating the integrity, maintaining anonymity in all cases.

Development of the Clinical Case

A 24-year-old woman with a personal history of ovarian cyst diagnosed 2 years ago on treatment with Microgynon oral contraceptives that she discontinued by medical decision 6 months ago, without drug allergies, gynecological history, menarche at 12 years, regular menstrual cycles every 28 to 30 days and duration of 3 to 4 days, last Pap smear does not remember, gestations 1 births 1 live children 1 abortions 0. The reason for the consultation for which she goes for a check-up is long-standing colic abdominal pain, she started her abdominal pain a year ago; However, it subsided with the administration of analgesics, approximately 3 months ago the pain was exacerbated, initially localized at the level of hypogastrium and bilateral iliac fossa, which radiated to the lumbar region, accompanied by abdominal distension and fatigue. He went to the outbound house where abdominal ultrasound was performed, which showed a localized pelvic solid mass, of low echogenicity of approximately 150 x 92 mm, oriented to the left, with areas of vascularized color Doppler. Transvaginal ultrasound was also performed, which showed a uterus in anteversion of normal morphology measuring 54x35 mm, echogenic endometrium of 4.5 mm, and a large amount of fluid in the pelvic cavity of the particulate type.

On physical examination, stable vital signs: temperature 36.2 degrees, blood pressure 110/70 mm/hg, pulse 89 beats per minute, respiratory rate 20 breaths per minute, oxygen saturation 96%. Anthropometry: weight: 69 kg, height: 1.62 cm and a BMI of 26.3 (overweight). On physical examination, the patient was conscious, calm, oriented, warm skin, capillary filling in 2 seconds, oral mucous membranes semi-moist, neck without lymphadenopathy, globular abdomen, soft depressible painful on palpation in the hypogastrium, palpable mass of painful hard consistency of about 10 cm, percussion hypertympanism throughout the abdomen, genital inguinal region: Gynecological examination revealed a normal macroscopic cervix, Naboth's cyst, and a vaginal examination of the anterior cervix without dilation, soft to the bimanual touch, a dependent mass of the right ovary of about 14 cm in diameter with a hard, painful, fixed, non-movable consistency. Symmetrical limbs mobile, muscle strength preserved, with distal pulses present with edema ++. To the neurological examination vigilant, oriented in time, space and person.

Post-Surgical Note

Under asepsis and antisepsis standards and under general anesthesia, exploratory laparotomy plus right salpingophorectomy plus frostbite plus left salpingophorectomy plus freezing plus total abdominal hysterectomy plus partial omentectomy, plus meso biopsy of the small intestine plus biopsy of the left paracolic slide plus right paracolic slide biopsy plus fundus Douglas biopsy plus Jackson Pratt drain placement plus wall closure.

Finds

The presence of ascitic fluid in an approximate amount of 8000 cc, right ovaries of 20 by 18 by 16 cm, left ovary of 26 by 24 by 22 cm, of mixed solid and cystic content, ruptured cyst when explored, uterus of 6 by 5 by 4 cm, multiple tumor implants (carcinomatosis) of 5 to 8 mm of fundus level of the sac, right and left paracolic slides, fundus sac, greater omentum, multiple implants at the level of minor and major curvature of the stomach, with retraction of the greater omentum. Multiple metastatic nodules in the hepatoduodenal ligament, and a 3 cm tumor at the level of the gastric fundus. Apparently of primary origin. Bleeding of approximately 300 ml. The results of freezing are received indicating malignancy and the diagnosis of metastatic gastric cancer, so the prognosis and objective of palliative treatment are discussed with the patient and the family, accepting the risks and probable benefits of such therapy.

Patient undergoes 3 cycles of chemotherapy, first cycle 06/04/2023 with flot scheme, next admission April 20, 2023, however treatment is deferred, she is admitted to the José Carrasco Arteaga hospital from 09/04/2023 to 21/04/2023 due to abdominal pain 10/10 in VAS that improves with clinical management. Ultrasound of the left grade II hydronephrosis abdomen was performed, a CT scan was reviewed, which reported a left kidney with slight dilation of the left ureter in the middle third, normal renal function, so surveillance was recommended.

On 05/18/2023, he was admitted for the third cycle of chemotherapy, however, on physical examination, a decreased vesicular murmur in both bases, chest X-ray was performed, evidence of bilateral pleural effusion grade I, patient with persistence of tachycardia tachypnea, an assessment by internal medicine was performed, he requested money D, which was positive 2.57, so chemotherapy was suspended and chest CT angiography was requested. Wells 4 moderate risk, it is evaluated jointly with the attending physician of intensive therapy and considers that an evaluation is carried out in the first instance by thoracic surgery for placement of a bilateral chest tube, in addition it is not possible to assess the venous system by amount of pleural fluid, anticoagulation is suspended in the thoracentesis plan, which is performed by draining 680 ml of sallow liquid, Patient after hemodynamically unstable procedure, with supplemental oxygen due to persistent cough and desaturation, persistent tachycardia, blood pressure of 90/70, patient in poor general condition. However, relatives of patients request voluntary discharge, despite medical recommendations, risks and complications are indicated, however, they sign consent to abandon in-hospital treatment.

Results

In this section, the results obtained from the information provided by the AS400 system of the José Carrasco Arteaga Hospital in the city of Cuenca will be presented. A detailed analysis will be carried out to identify the diagnostic scheme that allowed the correct identification of the pathology under study, Krukenberg's Tumor. In addition, the clinical manifestations that the patient initially experienced will be recognized, as well as any comorbidities that may have been present during the initial medical evaluation. Through a detailed approach based on the data provided by the AS400 system, these key aspects will be addressed to shed light on the diagnostic process and clinical presentation of the patient.

Board 1. Patient history

Variable	Value
Age	24 years old
Medical history	Ovarian cyst (2 years), oral contraceptives (discontinued 6 months ago)
Menarche	12 years
Menstrual cycles	Regular, every 28-30 days, duration 3-4 days
Deeds	1
Delivery	1
Living Children	1
Abortions	0

Taken from the AS400 system of the José Carrasco Arteaga Hospital in the city of Cuenca.

The patient's medical and gynecological history play a crucial role in the evaluation of Krukenberg's tumor. In the case presented, several relevant aspects are highlighted, firstly, the age of the patient, which is 24 years, is important since this type of tumour is usually found in older women. In addition, the history of an ovarian cyst that was diagnosed 2 years ago and the discontinuation of oral contraceptives 6 months ago are significant data, as they could be related to the development of the tumor. Early menarche at age 12 and regular menstrual cycles are also factors to consider, as they can provide insight into a patient's hormonal history. In addition, the history of a previous pregnancy and successful delivery, along with the absence of miscarriages, could influence the clinical presentation and prognosis of Krukenberg tumor.

Board 2. Clinical Findings

Find	Description
Reason for consultation	Cramping abdominal pain
Duration of pain	1 year
Location of pain	Hypogastrium, bilateral iliac fossae, lumbar region
Other symptoms	Bloating, fatigue
Ultrasound findings	Low-echogenicity, left-facing, pelvic solid mass with color Doppler vascularization
Physical Exam	Globulous abdomen, hard abdominal mass, percussion hypertympanism in abdomen
Gynecological Exam	Normal cervix, Naboth's cyst, dependent mass of right ovary 14 cm in diameter, hard, fixed consistency

Taken from the AS400 system of the José Carrasco Arteaga Hospital in the city of Cuenca.

The clinical and radiological findings presented in this case are critical for the evaluation and diagnosis of Krukenberg tumor. The reason for consultation, which is colicky abdominal pain that persists for a year, along with the location of the pain in the hypogastrium, bilateral iliac fossae and lumbar region, is indicative of an underlying condition. In addition, additional symptoms of bloating and fatigue may be relevant to the assessment of the patient's overall condition. On the other hand, gynecological examination is crucial for the identification of the dependent mass of the right ovary of 14 cm in diameter with a hard and fixed consistency.

Board 3. Exam and test results

Test	Result
Serology (VDRL)	Negative
Antigen Australia (hbs-ag)	0.43 (non-reactive)
HIV	Negative
Hemostasis (INR, TP, TTP)	INR 0.87, TP 10.5, TTP 29.1
Blood biometry	Various blood count, glucose values
Renal function (urea, creatinine, uric acid)	Normal Values
Urinalysis (Infectious Emo)	Various Urine Characteristics

Taken from the AS400 system of the José Carrasco Arteaga Hospital in the city of Cuenca.

Test results are crucial for assessing the patient's health and planning treatment. In the case of serology (VDRL), being negative rules out syphilis, which may present symptoms similar to the tumor. As for blood count, it provides information about blood function, including possible disorders such as anemia. There is no doubt that the details of the urine test are important to assess kidney health and rule out urinary tract infections. These results are critical for care and treatment planning, especially if surgery to address Krukenberg's tumor is contemplated.

Board 4. Diagnosis

Date	Diagnosis
25/2/2023	Diagnosis During Surgery: Metastatic Gastric Cancer Freeze Confirmation: Malignancy
9/4/2023	Left hydronephrosis
18/5/2023	Bilateral pleural effusion

Taken from the AS400 system of the José Carrasco Arteaga Hospital in the city of Cuenca.

This diagnosis indicates that, during surgery, signs of metastatic gastric cancer were found in the patient. This means that the cancer originated in the stomach and has spread to other parts of the body, such as the ovaries and peritoneal cavity, i.e., Krukenberg's tumor. It should be noted that the diagnosis of left hydronephrosis indicates an abnormal accumulation of urine in the left kidney due to an obstruction in the urinary system. This blockage may be caused by tumor growth or other disease-related complications. Taken together, these diagnoses indicate that the patient faces a complex and serious situation with the spread of gastric cancer to other organs and related complications, such as hydronephrosis and pleural effusion.

Board 5. Treatment and evolution

Treatment	Evolution
Chemotherapy (first cycle)	Not completed due to health concerns
Hospitalization for abdominal pain	Evaluation of hydronephrosis and others
Chemotherapy (third cycle)	Interruption due to complications

Taken from the AS400 system of the José Carrasco Arteaga Hospital in the city of Cuenca.

The events recorded in this table indicate the evolution of the patient's treatment and medical care after surgery. The patient began his treatment with chemotherapy after surgery. However, these events indicated that the patient was experiencing difficulties in continuing chemotherapy treatment, which may be due to a variety of factors, such as tolerance of treatment, serious side effects, or additional medical complications.

Board 6. Additional Clinical Features

Feature	Description
General Condition	Dynamically unstable heme, tachycardia, tachypnea, desaturation
Hospitalization	Arrivals and dates
Test Results	Positive D-dimer (2.57)
Imaging Findings	Left kidney with mild dilation of the left ureter, bilateral pleural effusion
Medical Evaluation	Consideration of Moderate Risk of Lung Embolism

Taken from the AS400 system of the José Carrasco Arteaga Hospital in the city of Cuenca.

In summary, these additional clinical features reflect the severity of the patient's situation, with cardiovascular problems, pulmonary complications, and risk of pulmonary embolism. Medical evaluation indicates that the patient is at moderate risk for pulmonary embolism, which is a blockage in a pulmonary artery usually caused by a blood clot. This is a major concern for the patient's health and can contribute to their unstable state.

Discussion

The symptoms observed in this case include a set of signs that manifest with a constitutional syndrome. This is characterized by the presence of a cachectic state, a decrease in white blood cells, as well as reduced levels of electrolytes and transaminases on clinical analysis (1,2). Through this research, the most relevant aspects of a particular case, found in the AS400 system, of the José Carrasco Arteaga Hospital in the city of Cuenca, were evaluated. Clinical and diagnostic findings in

the case of the patient with Krukenberg tumor reveal a complex presentation of this disease. Initially, chronic abdominal pain was observed, accompanied by ultrasound findings suggesting a Krukenberg tumor in the right ovary, which was later confirmed during surgery.

As argued by Forteza, et al. (1) author, early diagnosis of Krukenberg tumor can be delayed, and this is related to the lack of specific symptoms in the initial stages of the disease. Regarding the case studied, the patient had a history of an ovarian cyst diagnosed 2 years ago and the discontinuation of oral contraceptives 6 months ago, this history could have contributed to the delay in diagnosis, since the symptoms may have been initially attributed to previous conditions.

On the other hand, Mendoza et al, (2), mention that imaging studies, such as ultrasonography and computed tomography, are useful for diagnosis. In the case you presented, the ultrasound findings and test results are consistent with this clinical practice, as they were used to confirm the presence of the tumor. In addition, the author notes that the prognosis of Krukenberg tumor is generally poor, with a median survival of 3 to 10 months, which coincides with the severity of the disease in the case presented, where serious complications such as hydronephrosis and bilateral pleural effusion were observed (2). In relation to the above, the challenges in the diagnosis and treatment of Krukenberg tumor, and the complexity of this disease imply that the patient's medical and gynecological history provide an essential perspective in this context and highlight the importance of comprehensive medical care and careful consideration of the patient's medical history in the evaluation of this disease.

When comparing the case study analyzed in this research with the study on the depth of the tumor by Krukenberg, Osama and Nicastri (3), it can be stated that both cases involve young women with a gynecological history, including ovarian cysts in the past. Similarly, in both cases, the main clinical presentation is long-standing crampy abdominal pain, which has become more severe in a relatively short period of time, and in both cases ultrasound findings of a pelvic solid mass on the left side are mentioned. However, in the clinical case taken from the AS400 system, from the José Carrasco Arteaga Hospital in the city of Cuenca, a previous pregnancy and a successful delivery are mentioned, while the other case does not provide details about the obstetric history (3).

During the physical examination of the clinical case taken from the AS400 system, from the José Carrasco Arteaga Hospital in the city of Cuenca, several important findings were found, including a hard and painful abdominal mass of approximately 10 cm, percussion hypertympanism throughout the abdomen and a right ovarian-dependent mass of about 14 cm in diameter. which is hard, painful, and fixed. In the ultrasound findings and physical examination mentioned in other studies, the presence of a solid mass in the pelvic area, with notable features, such as vascularization detected in color Doppler and the significant amount of fluid in the pelvic cavity of the particulate type (4,5).

On the other hand, there are other similar evaluations in which physical examinations are performed using the description of the computed tomography scan and where an expansive cystic formation with calcifications and abnormal absorption by contrast is mentioned (6,7). Although it shares some similarities with ultrasound findings, CT scans provide additional information, such as cystic expansion and contrast absorption characteristics. In this case, computed tomography offers a more detailed view of the morphology of the mass and its relationship to other intra-abdominal structures, such as the intestinal loops.

According to Zamudio (8), the presenting symptoms of the disease are very nonspecific, among them are: abdominal pain, abdominal distension, palpable mass, loss of appetite, weight loss, changes in menstrual bleeding, and dyspareunia. Given the subtle clinical presentation of TK, with few symptomatic manifestations and non-specific clinical signs, difficulties may arise leading to late diagnosis. These tumors often affect both ovaries, accounting for more than 80% of cases, due to their metastatic nature (9).

Another study by Aziz et al, (10), encompassed 38 female patients with Krukenberg tumors, this type of tumor being a rare form of ovarian cancer that originates elsewhere in the body and accounts for approximately 1-2% of all ovarian cancers. The most common manifestation of this disease was abdominal pain, experienced by almost 40% of patients (9). The main source of metastasis was the colon, followed by the stomach. In approximately half of the cases, the diagnosis of Krukenberg tumor

was made at the same time as the diagnosis of the primary tumor, where most patients had received chemotherapy prior to surgery and continued postoperative treatment (10,11).

Regarding the methods used in the clinical case taken from the AS400 system, from the José Carrasco Arteaga Hospital in the city of Cuenca, it was observed that abdominal and transvaginal ultrasound were used, as well as laboratory analysis. These methods were essential in identifying the pelvic mass, assessing renal function, and determining the presence of ascitic fluid. However, other clinical evaluations highlight that none of the imaging methods, including CT, ultrasound (USA), and magnetic resonance imaging (MRI), are completely reliable in distinguishing primary ovarian tumors (11,13). Even though primary ovarian tumors often have different features on ultrasound and MRI, there is no clear difference that would allow for definitive identification.

However, in the clinical case found in the AS400 system at the José Carrasco Arteaga Hospital in the city of Cuenca, the studies contributed to the initial evaluation of Krukenberg's tumor. Although it is mentioned that CT may not be completely definitive in differentiating between primary ovarian tumors and OST, it remains an important tool for assessing the extent of disease and guiding treatment. Both of the studies mentioned above are directly related to Krukenberg's tumor. However, in cases of OST, the distinction between primary ovarian and OST tumors can be challenging, and other diagnostic and clinical evaluation modalities should be considered in conjunction with CT to make informed treatment decisions, they say (14,15).

It is worth mentioning that, in the clinical case evaluated, the performance of an exploratory laparotomy and additional surgical procedures allowed a more detailed view of the intraoperative findings, including the presence of ascitic fluid, the size of the ovaries, the presence of tumor implants, and the identification of a primary gastric tumor. The importance of informed decision-making by the patient and her family was also highlighted, especially in relation to palliative treatment and considerations on the abandonment of in-hospital treatment. Arguably, this clinical case presents a complex history with severe abdominal symptoms and significant findings in ultrasound and physical studies.

In order to compare the case evaluated with other studies, it can be seen that a procedure performed on a 38-year-old woman was able to yield lesions of metastatic origin, in which vasculolymphatic carcinoma of the uterine tubes was observed (18). In addition, the occurrence of bilateral pleural effusion, new liver lesions, and severe ascites over time is mentioned, indicating aggressive disease progression. It can be said that both cases have similarities in terms of confirming that it is a metastatic cancer of gastric origin. In the case of the 24-year-old woman studied, it is mentioned that the patient was diagnosed with "metastatic gastric cancer" during surgery, which is consistent with the gastric origin of the metastatic lesions. Reference is also made to the subsequent confirmation of the metastatic origin of the lesions.

However, there are notable differences between the two cases, since in the case of Palomo et al. (18) a progression of the disease is observed with the appearance of new lesions in the liver, bilateral pleural effusion and severe ascites, indicating an aggressive and complicated clinical course. On the other hand, in the case taken from the AS400 system, from the José Carrasco Arteaga Hospital in the city of Cuenca, it is found that the patient had complications during chemotherapy treatment, including hydronephrosis and bilateral pleural effusion, but the presence of new liver lesions or ascites at that time is not detailed. In short, both cases involve metastatic tumors with gastric origin and share some similarities in terms of confirmation of metastatic origin. However, each case is unique in terms of the progression of the disease and the specific clinical complications experienced by the patients.

In general, it can be deduced that, in the clinical case of the José Carrasco Arteaga Hospital, the patient experienced abdominal pain for a year before seeking appropriate medical attention. This highlights the importance of awareness of persistent symptoms and the need to seek early medical attention. Surgery revealed significant findings, including enlarged ovaries, peritoneal carcinomatosis, including tumor implants in the abdominal cavity, and a metastatic gastric tumor. Since advanced metastatic cancer was diagnosed, a palliative treatment approach was chosen to relieve symptoms and improve the patient's quality of life.

If we compare the above with what was investigated by Jurado and Cadena (20), it could be said that both processes highlight the importance of recognizing the nonspecific nature of symptoms in patients with severe diseases, which can lead to a late diagnosis and, ultimately, to a less favorable prognosis. These authors underscore the need for early medical evaluation and an interdisciplinary approach in the management of patients with complex medical conditions.

The case presented at the José Carrasco Arteaga Hospital highlights the ethical and medical challenges related to decision-making and informed consent. The patient chose to discontinue in-hospital treatment, despite medical recommendations, raising ethical and medical questions about patient autonomy and the balance between the benefit and risks of treatment. It should be clarified that, in both cases, reference is made to a constitutional syndrome that includes symptoms such as cachexia (weakening and weight loss), decreased white cell lines (leukopenia), low levels of electrolytes and transaminases, and vaginal bleeding (metrorrhagia). In the clinical case, palliative treatment was chosen due to the advanced stage of metastatic gastric cancer, which also suggests a poor prognosis.

Conclusions

Through this research, Krukenberg's tumor was explored, an extremely rare ovarian pathology that represents a small but significant fraction of malignant tumors of the ovary. Krukenberg tumor is characterized by its metastatic nature and is often associated with a poor prognosis. Its prevalence varies according to the population studied, being more common in regions with a high incidence of gastric carcinoma.

In this work, the AS400 system of the José Carrasco Arteaga Hospital in Cuenca was used to collect relevant information from a clinical case that illustrates the complexity of this disease. The data collected includes results of diagnostic tests such as serology, blood count, and urinalysis, which are critical for ruling out other conditions and planning appropriate treatment. The physical and ultrasound findings in the clinical case underscore the importance of a thorough evaluation. The presence of a solid mass in the pelvic area, vascularization detected on color Doppler, and fluid accumulation in the pelvic cavity are key signs that can alert healthcare professionals to the possibility of a Krukenberg tumor.

This study highlights the need for multidisciplinary evaluation and comprehensive care to effectively address Krukenberg's tumor. The combination of clinical data, diagnostic tests, and expert evaluation is essential for early diagnosis and appropriate treatment. The patient in this case underwent surgery and chemotherapy but also faced challenges in continuing treatment, underscoring the importance of a holistic approach in the care of these patients. Overall, this case study provides a detailed view of the complexity of Krukenberg's tumor and emphasizes the need for early detection, accurate diagnosis, and comprehensive treatment to improve the prognosis of patients affected by severe disease.

Bibliography

1. Forteza M, Ramos A, Gómez G, Almeida A, Pérez M, Quintero. Krukenberg tumor secondary to colon carcinoma during pregnancy. Rev Cubana Obstet Ginecol 2015; 41(2): 170-175. Available in: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0138-600X2015000200009&lng=es.
2. Mendoza-Rosado F, Núñez-Isaac O, Espinosa-Marrón A, López-Arjona K, Dávila-Martínez F. Krukenberg tumor as an incidental finding in a full-term pregnancy: a case report. J Med Case Rep. 2021 May 29; 15(1):304. https://jmedicalcasereports.biomedcentral.
3. Al-Agha OM, Nicastri AD. An in-depth look at Krukenberg tumor: an overview. Arch Pathol Lab Med. 2006 Nov; 130(11):1725-30. https://pubmed.ncbi.nlm.nih.gov/17076540/
4. Zogbi L, Isaias A, Machado PA, Neutzling A, Juliano C. Krukenberg's unilateral tumour giant metachronous of colonic origin - Case report. Int J Surg Case Rep. 2017;41:184-187. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5686220/
5. Sota Yoldi LA, Vigil Vigil L, Martín Domínguez C, Antunes Parente B. Krukenberg Tumor Secondary to Lung Adenocarcinoma. Arch Bronconeumol (Engl Ed). 2019 Jul; 55(7):380-381. English, Spanish. https://www.archbronconeumol.org/en-krukenberg-tumor-secondary-lung-

adenocarcinoma-articulo-S1579212919301235
6. Aziz M, & Kasi A. Cancer, krukenberg tumor. (2020). Treasure Island (FL): StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK482284/
7. Berthé A, Diop MM, Bentefouet L, Ba PA, Faye FA, Touré PS, Thiam M, Gueye L, Diop BM, Ka MM. Ascite fébrile chez la femme, ne pas méconnaitre une tumeur de Krukenberg [Ascites and fever in women: do not rule out Krukenberg tumor]. Pan Afr Med J. 2015 Aug 11;21:269. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4633835/
8. Zamudio J, Leonher K, Leoner J. Krukenberg tumor: primary in the colon and bilateral in the ovary. Case report. (2014) Comprehensive Oncology Care Unit. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-00992014000300165
9. Aziz M, Killeen RB, Kasi A. Krukenberg Tumor. 2023 Feb 21. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 29489206. https://pubmed.ncbi.nlm.nih.gov/29489206/
10. Seow-En I, Hwarng G, Tan GHC, Ho LML, Teo MCC. Palliative surgery for Krukenberg tumors - 12-year experience and review of the literature. World J Clin Oncol. 2018 Feb 10; 9(1):13-19. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5807888/
11. Kubeček O, Laco J, Špaček J, Petera J, Kopecký J, Kubečková A, et al. The pathogenesis, diagnosis, and management of metastatic tumors to the ovary: a comprehensive review. Clin Exp Metastasis. 2017 Jun; 34(5):295-307. https://pubmed.ncbi.nlm.nih.gov/28730323/
12. Crăciun MI, Domșa I. Immunohistochemical diagnosis of Krukenberg tumors. Rom J Morphol Embryol. 2017; 58(3):845-849. https://pubmed.ncbi.nlm.nih.gov/29250663/
13. 13.Shah B, Tang WH, Karn S. Transcoelomic spread and ovarian seeding during ovulation: A possible pathogenesis of Krukenberg tumor. J Cancer Res Ther. 2017 Jan-Mar; 13(1):152-153. https://pubmed.ncbi.nlm.nih.gov/28508852/
14. Fujimoto D, Hirono Y, Goi T, Yamaguchi A. Sigmoid colonic metastasis by lymphatic spread occurring with unilateral Krukenberg tumor considered to be caused by stage IA early gastric cancer: A case report. Oncol Lett. 2016 Jan; 11(1):668-672. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4727168/
15. Agnes A, Biondi A, Ricci R, Gallotta V, D'Ugo D, Persiani R. Krukenberg tumors: Seed, route and soil. Surg Oncol. 2017 Dec; 26(4):438-445. https://pubmed.ncbi.nlm.nih.gov/29113663/
16. Lionetti R, De Luca M, Travaglino A, Raffone A, Insabato L, Saccone G, Mascolo M, D'armiento M, Zullo F, Corcione F. Treatments and overall survival in patients with Krukenberg tumor. Arch Gynecol Obstet. 2019 Jul; 300(1):15-23. https://pubmed.ncbi.nlm.nih.gov/31044302/
17. Aurello P, Berardi G, Antolino L, Antonelli G, Rampini A, Moschetta G, Ramacciato G. Is a Surgical Approach Justified in Metachronous Krukenberg Tumor from Gastric Cancer? A Systematic Review. Oncol Res Treat. 2018; 41(10):644-649. https://karger.com/
18. Palomo Rodríguez MD, Brenner Anidjar RD, Gallardo Martínez J, Jiménez Gallardo J, Márquez Maraver F, Pantoja Garrido M. Prognostic factors influencing survival in patients with Krukenberg tumor. Prog Obstet Ginecol [Internet]. 2021 [accessed 11 September 2023]; (64):195-9. Available in: https://sego.es/documentos/.
19. Córdoba Chaverra E, Chao Pereira C, Álvarez Cd, Herrera Rojas M. Krukenberg's tumor, a silent but deadly killer. Infomed [Internet]. 2023 [accessed September 11, 2023]; 24(1). Available at: https://revactamedica.
20. Jurado-arcInIegas IA, Cadena-Espada JD. A Krukenberg tumor in a young patient. ActA MedicA Colomb [Internet]. 2023 [accessed September 11, 2023]; 48(2). Available in: https://doi.org/10.36104/amc.2023.2736