CIRUGÍA PARAGUAYA

English version

Vol. XLVI N°3 December 2022

Contents

Scientific body of the Paraguayan Society of Surgery (SOPACI)

ISSN 2070-8785
ISSN 2307-0420 (en línea)

CIRUGÍA PARAGUAYA
Scientific body of the
Paraguayan Society of Surgery

Founded on October 6, 1970

Volume XLVI
Number 3
December 2022

ISSN 2070-8785
ISSN 2307-0420 (on line)

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CIRUGÍA PARAGUAYA

Scientific body of the Paraguayan Society of Surgery (SOPACI)

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EDITORIAL

The end of a very successful year

Cierra un año exitoso

***Helmut Alfredo Segovia Lohse**

Universidad Nacional de Asunción. Facultad de Ciencias Médicas. II Cátedra de Clínica Quirúrgica. San Lorenzo, Paraguay
Hospital General de Lambaré. Lambaré, Paraguay

After the COVID-19 pandemic locked us up and turned our lives into a virtual merry-go-round, 2022 came brimmed with good wishes from the start. Hybrid meetings started happening and were immediately followed by full on-site congresses in the county's most inland regions. Also, our fully on-site surgical meeting was held with tremendous success. Finally, our journal is now published in English language too and, in this issue, comes with ten different papers, and each and everyone of them could not be more interesting.

We should mention the 20th Paraguayan Congress of Surgery held from September 21 through September 23, 2022. Record of attendance! 2705 people including over 800 doctors, 1500 students and several surgeons, and nurses all shared moments of science, exchanged opinions, and were involved in different social activities. Also, several Paraguayan teachers attended, as well as all the Paraguayan Society of Surgery working groups coordinated by the organizing committee. They all made this 20th Paraguayan Congress of Surgery tremendously successful with international guest attendees from Argentina, Bolivia, Brazil, Chile, Colombia, Spain, México, Peru, and Uruguay. We wish to thank all the international visitors we had who made the effort of coming from abroad and visiting our country, our people, and our science. Thank you very much to all of you. We wish you the best.

Our journal keeps getting stronger and stronger. However, there are still difficulties trying to understand the Open Journal System for manuscript submission and review. If you encounter these, please do not hesitate to contact our editor for clarification purposes. Reviews and suggestions are always intended to achieve more and better scientific articles. In this regard, a special thanks to the last reviewers (cited in alphabetical order):

- Agüero, Ángel
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Remember that the journal continues to receive articles through the platform for authors, and those interested in being peer reviewers can contact revista@sopaci.org.py. See you soon in 2023!

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Original article Doi: 10.18004/sopaci.2022.diciembre.7

Clinical and sociodemographic characteristics of patients diagnosed with gastric cancer at the Itauguá National Hospital. 2019-2020

Características clínicas y sociodemográficos de pacientes con diagnóstico de cáncer gástrico en el Hospital Nacional de Itauguá. 2019-2020

***Miguel Ángel Aranda Wildberger** [1]
***Francisco Hiroyuki Yanagida Arakawa** [1]
****Camila Petry Bottini** [2]

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ABSTRACT

Introduction: Gastric cancer is the fifth most frequent neoplasm in the world and has a high mortality. Initial symptoms are nonspecific. The diagnostic standard is gastroscopy. **Objectives:** To know the clinical and sociodemographic characteristics of patients diagnosed with gastric cancer at the Itauguá National Hospital. Period 2019 - 2020. **Material and methods**: observational, descriptive, cross-sectional study; with non-probabilistic sampling of consecutive cases, of patients diagnosed with gastric cancer, who attended the General Surgery Service of the Itauguá National Hospital, period 2019 - 2020. 24 clinical records of patients who met the inclusion criteria were collected. **Results**: Of 24 patients, 87.5% were men. With a mean age of 61 years ± 10. The most frequent reason for consultation was constitutional syndrome 47%. Helycobacter pylori infection was found in 42%. The pre-surgical TNM stage was stage 4 in 50%, and the most frequent histological type was the intestinal type adenocarcinoma 50% followed by the diffuse type 46%. **Conclusion**: Gastric cancer predominantly affects males, with a mean age greater than 60 years. Constitutional syndrome is the most frequent reason for consultation. The most frequent histological type is intestinal adenocarcinoma

Key words: *gastric neoplasm, helycobacter pylori, Diagnosis, classification.*

RESUMEN

Introducción: El cáncer gástrico es la quinta neoplasia más frecuente en el mundo y posee una alta mortalidad. Los síntomas al inicio son inespecíficos. El estándar de diagnóstico es la gastroscopía. **Objetivos**: Conocer las Características clínicas y sociodemográficas de pacientes con diagnóstico de cáncer gástrico en el Hospital Nacional de Itauguá. Periodo 2019 - 2020. **Material y métodos:** estudio observacional, descriptivo, de corte transversal; con muestreo no probabilístico de casos consecutivos, de Pacientes con diagnóstico de cáncer gástrico, que acudieron al Servicio de Cirugía General del Hospital Nacional de Itauguá, periodo 2019 - 2020. Se recabaron 24 expedientes clínicos de pacientes que cumplían con los criterios de inclusión. **Resultados:** De 24 pacientes, 87,5% fueron hombres. Con edad media de 61 años ± 10. El motivo de consulta más frecuente fue el síndrome constitucional 47%. Se encontró infección por Helycobacter pylori en un 42%. El estadio prequirúrgico TNM fue estadio 4 en un 50%, con el tipo histológico más frecuente fue el Adenocarcinoma tipo intestinal 50% seguido del tipo difuso 46%. **Conclusión:** El cáncer gástrico afecta predominantemente al sexo masculino, con una media de edad superior a 60 años. El síndrome constitucional es el motivo de consulta más frecuente. El tipo Histológico más frecuente es el Adenocarcinoma intestinal.

Palabras claves: *cáncer gástrico, Helicobacter pylori, Diagnóstico, clasificación.*

INTRODUCTION

Gastric cancer is the fifth most common neoplasm worldwide. According to the World Health Organization (WHO),[1] in 2018, there were nearly 1 034 000 new cases of gastric cancer across the world (5.7% of all the cases of cancer reported). These data show that, although its incidence rate has gone down, mortality

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Date of reception: 07/06/2022 - Date of approval: 10/11/2022
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rate still remains high[2]. The 5-year survival rate is 20% due to delayed diagnosis. However, in countries with advanced cancer screening programs, the 5-year survival rate is nearly 90%.[3]

Factors predisposing towards this neoplasm are the use of fatty, salty, and smoked food, alcohol, hot drinks, and a diet soft on fiber, fruit and vegetables, and the use of N-nitroso compounds.[4] Another predisposing factor is infection due to *Helicobacter pylori* that is a class I human carcinogen for gastric cancer of both subtypes (diffuse and intestinal).[5,6]

Early symptoms are non-specific, and similar to those of other gastric conditions. Epigastric pain is an early symptom in nearly 70% of the cases. Nausea, vomiting, early satiety, and constitutional syndrome (anorexia, asthenia, and weight loss).[5] The physical examination is normal at the beginning and only a third of the patients will show hidden blood in feces.[5]

Early diagnosis can be achieved through screening of large populations or targeted at higher-risk populations. This will depend on the prevalence of gastric cancer in the region at stake.[2] The standard diagnosis is gastroscopy with biopsy samples.[6]

Adenocarcinoma amounts to almost 90% of all stomach neoplasms.[7] It can be categorized according to Lauren classification into: the intestinal type (characterized by the formation of tubular structures arranged in tubular or gland formations). This type of adenocarcinomas are the ones most commonly associated with environmental and dietary factors. Also, they are predominant in regions of high incidence rate. The second type is the diffuse type. It consists of cells that lack adhesion and infiltrate the gastric wall without glandular appearance. It appears at younger ages in women and has a grim prognosis[8]. When a large section of gastric tissue is involved, it is called gastric linitis plastica.[9] Staging used is the TNM Classification of Malignant Tumors designed by the AJCC/UICC ***(see table 1)***.[10]

Treatment is multidisciplinary and surgery is an important part since gross total resection is the only curative option.[11] Access route is often selected based on the TNM stage. Endoscopic mucosal resection, open or laparoscopic gastrectomy—whether typical or atypical—associated with lymphadenectomy are some of the surgical options available.[11] Gastrectomy can also be performed with palliative purposes.[12] To reinstate transit gastroduodenal anastomosis, techniques of Billroth I reconstruction, gastrojejunal anastomosis through Billroth II, gastrojejunal anastomosis in Roux-en-Y reconstruction, and jejunal

Table 1. TNM Classification of Malignant Tumors designed by the AJCC/UICC. Source: AJCC Cancer Staging Manual. 8th edition. Springer; 2017.10

Primary tumor (T)		
Tx: Primary tumor cannot be assessed. **T0:** No evidence of primary tumor. **Tis:** Carcinoma in situ. **T1:** Tumor invades lamina propria, muscularis mucosae or submucosa. **T1a:** Tumor invades lamina propria or muscularis mucosae. **T1b:** Tumor invades submucosa. **T2:** Tumor invades submucosa propria. **T3:** Tumor invades all muscular layers. **T4:** Tumor invades serosa and peritoneum. **T4a:** Tumor has grown into the serosa. **T4b:** Tumor has grown into other organs.		
Regional lymph nodes (N)		
Nx: regional lymph nodes cannot be assessed. **N0**: No regional lymph node metastasis. **N1:** Metastasis in 1 to 2 regional lymph nodes. **N2**: Metastasis in 3 to 6 regional lymph nodes. **N3:** Metastasis in 7 or more regional lymph nodes. **N3a**: Metastasis in 7 to 15 regional lymph nodes. **N3b:** Metastasis in 15 or more regional lymph nodes.		
Distant metastasis (M)		
Mx: No distant metastasis. **M0:** Cancer did not spread to other parts of the body. **M1:** Cancer did spread to other parts of the body.		
Stage	**T y T and N**	**M**
0	TisN0	M0
IA	T1N0	M0
IB	T2N0; T1N1	M0
IIA	T3N0; T2N1; T1N2	M0
IIB	T4aN0; T3N1; T2N2; T1N3a	M0
IIIA	T4aN1; T4aN2; T4bN0; T3N2; T2N3a	M0
IIIB	T1N3b; T2N3b; T3N3a; T4aN3a; T4bN1-2	M0
IIIC	T3N3b, T4aN3b, T4bN3a, T4bN3b	M0
IV	Any T and N	M1

and esophago-jejunal interposition reconstruction can be used, among others.[10]

Although, in our country, the actual incidence rate of gastric cancer is low, there is a great social impact due to its high mortality and morbidity. Diagnosis often comes late since symptoms are non-specific, and similar to those of other non-neoplastic gastric conditions, which reduces the chances of satisfactory curative treatment.[13]

The objective of this study was to know the clinical and social and demographic variations of patients with a diagnosis of gastric cancer at the General Surgery Unit of *Hospital Nacional de Itauguá*, Itauguá, Paraguay from January 2019 through September 2020.

MATERIALS AND METHODS

This is a descriptive, observational, retrospective, and cross-sectional study with non-probabilistic sampling of consecutive cases of all patients with a diagnosis of gastric cancer admitted to the General Surgery Unit of *Hospital Nacional de Itauguá*, Itauguá, Paraguay from January 2019 through September 2020. Inclusion criteria were age > 18 years regardless of sex, endoscopic and anatomopathological diagnosis of gastric cancer at the General Surgery Unit of *Hospital Nacional de Itauguá*, uninvolved gastroesophageal junction, and patients with complete health records. The health records of 24 patients who met the inclusion and exclusion criteria were included in the study. Data were analyzed using Microsoft Excel spreadsheet and frequency (%) and dispersion measures (SD) tables were used.

Bioethical principles were observed at all times: Information obtained was analyzed under confidentiality standards. Codes of the health records of each patient were used. No informed consent was required since data were drawn from the health records. No risk of non-maleficence or discrimination existed. No conflicts of interest were reported either.

Study limitations: the size of the sample was too small, which complicates result extrapolation. It is a descriptive study that does not create data associations. The General Surgery Unit of *Hospital Nacional de Itauguá* does not have echoendoscopy technology available for diagnosis or staging purposed, which could have reduced the diagnostic accuracy of TNM staging.

RESULTS

Out of the 24 patients included, 12.5% (3) were women and 87.5% (21) men. In the distribution based on the age group the larger number of cases was reported from 50 through 69 years old (see figure 1). Mean age was 61 years ± 10; median age was 62 years while mode was 52 years.

The most common reason for consultation was constitutional syndrome (47%) followed by abdominal pain (34%), upper digestive bleeding (13%), and early satiety (6%) ***(see figure 2)***.

Regarding the origin of the patients, 92% (22) came from rural areas while 8% (2) from metropolitan areas. Concomitant infection due to *Helycobacter pylori*, according to the results of anatomical pathology examination of gastric biopsies that tested positive in 42% (10) and negative in 58% of the cases (14).

Preoperative stage according to the TNM Classification of Malignant Tumors was IIA in 17% (4), IIB in 17% (4), IIA in 13% (3) IIB in 4% (1), and stage IV in 50% (12). ***Table 2.***

Out of all the patients, a total of 58% (14) received palliative care, and 33% (8) surgical treatment. Total gastrectomy was performed in all the cases with D1 plus or D2 node drainage and esophageal-jejunal reconstruction in Roux-en-Y. A total of 8% (2) of the patients died at the hospital without any surgical or palliative care. The most common histological type found in endoscopic biopsies and the anatomopathological findings of the surgical pieces from patients treated with surgery was the intestinal type in 50% (12) of the patients followed by the diffuse type [46% (11)] and non-Hodgkin lymphoma [4% (1)].

Table 2. Distribution of patients based on the TNM stage.

Stage	N	%
I A	0	0 %
I B	0	0 %
II A	4	17 %
II B	4	17 %
III A	3	13 %
III B	1	4 %
IV	12	50 %
Total	**24**	**100%**

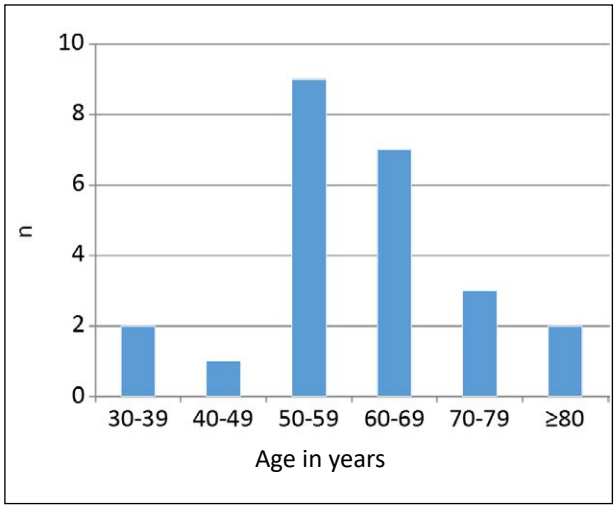

Figure 1: Distribution of patients based on age group. N = 24.

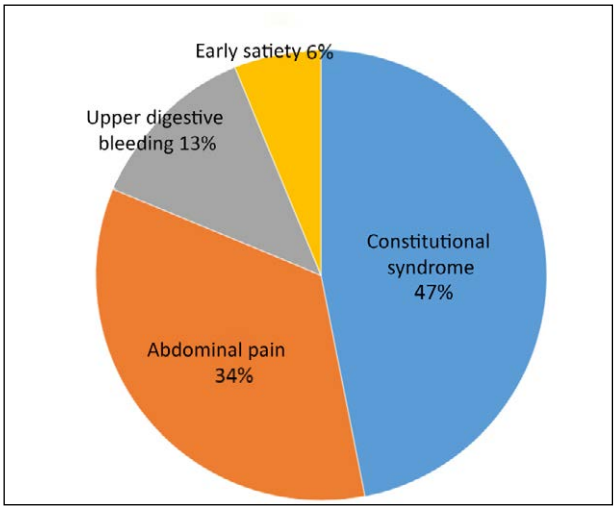

Figure 2: Distribution of patients based on reason for consultation.

DISCUSSION

Regarding the sex most commonly affected, masculine predominance was seen in 88% of the cases, which is consistent with data from World Cancer Research Found International that reports rates that are 2 or 3 times higher in men.[14] Opposing data were found by Dávila et al. who reported feminine predominance in 33 020 patients (64%).[15]

Mean age of patients with gastric cancer was 61 ± 10 years. In a study conducted by Dávila et al. in Costa Rica back in 2018, they saw that the mean age of patients with gastric cancer was 61.8 years, which are similar figures compared to those reported in our study15. Mean age of 68% of the population was somewhere between 50 and 69 years.

The most common reason for consultation was constitutional syndrome in 47% of the cases (a clinical manifestation of advanced disease) followed by abdominal pain (34%) according to the studies conducted by Carnecelli et al. who found pain as the first clinical sign of gastric cancer in 40 patients.[16] Upper digestive bleeding and early satiety are a rare finding as first clinical signs and are associated with advanced disease.[15] Similarly, the predominance of gastric cancer in patients from rural areas of 92% contradicts the data provided by Dávila et al. who found a similar distribution in metropolitan and rural areas with a large bias though.[15] This could be representative of sample bias because our center is geographically located outside the city limits of Asunción, Paraguay, where there is a huge population of patients from across the country.

The presence of *Helicobacter pylori* in 42% of the patients is slightly higher compared to the data provided by De León et al. and Hernández et al. who found prevalences of 32% and 39%, respectively.[17]

At diagnosis, 34% of the patients already had locoregional disease and the remaining 66% regionally advanced disease. None of the patients was diagnosed at the early stages of the disease, which can be due to delayed consultations since symptom onset. Treatment was palliative in 58% of the patients (a very high rate). However, this is what could be expected when cancer is diagnosed at late stages of the disease.

Regarding the histological type, the intestinal-type adenocarcinoma is still the most common of the two (reported in up to 50% of the cases) while the rate of diffuse-type adenocarcinoma is 46% (which is higher compared to other studies conducted in the region). For example, in Ecuador, Muñoz et al. found the intestinal type to be the most common one in 64.5% of the cases while the diffuse one was only the most common type in 29.0% of the patients.18 In Brazil, Carnicelli et al. also found predominance of the intestinal type in 68% of the patients with predominance of the diffuse type in 25% of the cases only.[16]

CONCLUSION

Gastric cancer predominantly affects men with a mean age of 61 years ± 10 at diagnosis. Constitutional syndrome is the most common reason for consultation in our population. Upper digestive bleeding and early satiety are a rare finding as the first clinical presentation. This type of cancer is predominant in patients from rural areas.

The presence of *Helicobacter pylori* is commonly detected at diagnosis. According to the TNM Classification of Malignant Tumors no gastric cancer was found in its early stages in our population. The most common histological type is still intestinal adenocarcinoma with increasing figures in the diffuse type.

Conflicts of interest

The authors declared no conflicts of interest whatsoever. Also, they observed ethics and good practices of the publishing house. No external funding was ever received to conduct this study.

Authors' contributions

MAAW was involved in the study design and idea, reference search, drafting and critical review of the manuscript. Also, he looked for intellectually relevant content, conducted a critical review, and gave his final approval to the manuscript. He was also involved in all aspects of work to guarantee that all questions associated with precision or integrity of any aspects of the study will be investigated and resolved adequately.

FHYA: contributed substantially to the study design, reference search, data mining, and data analysis. Also, he was involved in the drafting of several sections, and the manuscript final approval.

CPS participated in the study idea, data analysis, chart and figure creation, drafting and final approval of the manuscript.

Financing

The authors declare that they have not received any type of funding for the realization of this article.

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Original article Doi: 10.18004/sopaci.2022.diciembre.12

Prevalence of complications post insertion of Port-a-Cath® in the Hospital Central de Instituto de Previsión Social, 2019 to 2020

Prevalencia de complicaciones post colocación de Port-a-Cath® en el Hospital Central de Instituto de Previsión Social, 2019 al 2020

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SUMMARY

Introduction: Port-a-Cath® type devices are generally indicated in cancer patients with prolonged chemotherapy treatment, antibiotic therapy, transfusions of blood components. Complications related to the catheter can also occur that can lead to its malfunction. The objective of this research is to study the frequency of complications related to their placement. **Methods:** A retrospective descriptive observational study was conducted. A total of 337 patients with Port to Cath placement in the Central Hospital of the Social Security Institute of the year 2019-2020 were studied. **Results:** 106 (32%) correspond to the male sex and 231 (68%) to the female sex. Among the most frequent complications are reported: infection in 2.6%, catheter thrombosis in 0.8%. **Conclusion:** The Port to Cath type venous accesses are permanent implants that present a low incidence of complications, among the most frequent we find thrombosis and infection.

Keywords: Port-a-Cath®, complications, chemotherapy, infection, thrombosis

RESUMEN

Introducción: Los dispositivos tipo Port-a-Cath® generalmente se indican en pacientes oncológicos con tratamiento quimioterápico prolongado, antibioticoterapia, transfusiones de componentes sanguíneos. Igualmente pueden ocurrir complicaciones relacionadas al catéter que pueden llevar a su mal funcionamiento. El objetivo de esta investigación es estudiar la frecuencia de las complicaciones relacionadas con la colocación de los mismos. **Métodos:** Se realizó un estudio tipo observacional descriptivo retrospectivo. Se estudiaron un total de 337 pacientes con colocación de Port-a-Cath® en el Hospital Central del Instituto de Previsión Social del año 2019-2020. **Resultados**: Corresponden al sexo masculino 106 (32%) y al sexo femenino 231 (68%). Se obtuvo una frecuencia de complicaciones de 4,7%. Entre las complicaciones más frecuentes se informan: infección en un 2,6%, trombosis del catéter en 0,8%. **Conclusión:** Los accesos venosos tipo Port-a-Cath® son implantes permanentes que presentan una baja incidencia de complicaciones, entre las más frecuentes encontramos trombosis e infección.

Palabras clave: Port-a-Cath®, complicaciones, quimioterapia, infección, trombosis

INTRODUCTION

Currently, subcutaneous venous ports or Port-a-Cath® consist of a tunneled central venous catheter aimed at a subcutaneous pocket where a reservoir or sealed port is implanted. It consists of a port that is inserted into the thoracic wall and a catheter aimed at the junction of the superior vena cava with the right atrium.[1,2]

The acquisition of these permanent vascular accesses is, to this date, of paramount importance for the management of patients treated with prolonged IV treatment. Since these catheters started being used, the administration of chemotherapeutic therapies in cancer patients has become a safer and easier-to-use technique compared to former peripheral and transient systems that had several collateral defects like tissue irritation and sclerosis of vascular endothelium. [3,4,5]

The possibility of multiple long-term injections is among the

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benefits these devices bring. In addition, they allow us to draw blood in a less painful way. They contribute to improving the patient's quality of life, do not stop patients from doing the basic activities of daily life, and cosmetically, they are widely accepted. It has been reported that the length of stay (LoS) of the patients is also shorter, which reduces cost.[6]

Indications for use in cancer patients include chemotherapy, antibiotic therapy, and blood transfusions, resuscitation fluid therapy or access to blood flow for monitoring purposes. On the other hand, performing multiple catheterizations can trigger venous system thrombosis.7,8 Eventually, the use of these subcutaneous ports can reduce the anxiety associated with repeat punctures. Advantages are that these devices are easy to insert, remove, and handle. In addition, that they can reduce the risk of infection since the skin acts as a natural barrier to microorganisms. However, this technique is no stranger to complications and incidence rate is somewhere between 2% and 14%.[9,10,11]

Studies conducted reveal that the use of a Port-a-Cath® vs a central venous catheter guarantees treatment continuity in both the mid- and long-term, thus avoiding any interruptions of use.[12,13,14]

The objective of this study is to describe the prevalence of complications after placing a Port-a-Cath® at *Hospital Central de Instituto de Previsión Social*, Asunción, Paraguay from 2019 through 2020.

MATERIALS AND METHODS

This is a retrospective, descriptive, cross-sectional, and observational clinical trial with non-probability sampling of cancer patients with an indication for chemotherapy treated with fully implantable Port-a-Cath® devices at *Hospital Central de Instituto de Previsión Social*, Asunción, Paraguay from 2019 through 2020. Patients > 18 years-old from both sexes were included in the study. Review data were obtained from the registries of surgical reports and past medical histories of patients who underwent such procedure. To study the variables, data were included in a Microsoft Office Excel 2007 spreadsheet for statistical analysis. This study respected the right to privacy and identity confidentiality of the medical records of patients who participated in the study.

RESULTS

A total of 337 patients treated with Port-a-Cath® devices at *Hospital Central de Instituto de Previsión Social*, Asunción, Paraguay from 2019 through 2020. Patients were studied. A total of 106 were men (32%) and 231 were women (68%) with a mean age of 57 years. A total of 88% and 12% of the cases were treated at the vascular surgery unit and general surgery unit, respectively.

These are some of the conditions—shown by order of frequency—that triggered the use of Port-a-Cath® devices: breast cancer (40%), color cancer (18%), lymphomas (10%), stomach cancer (9%), rectum cancer (5%), pancreatic cancer (4.5%), uterine cancer (2%), neuroendocrine tumor (1%), liver cancer (1%), gallbladder cancer (1%), lung cancer (1%), esophageal cancer (1%), and ampulla of Vater carcinoma (0.5%). ***(Figure 1)***

An overall rate of infections of 4.7% was obtained from the total number of cases studies throughout this period was reported. When such complications were detailed the most common ones were infection, 2.6%; catheter thrombosis, 0.8%; skin necrosis, 0.3%; pneumothorax, 0.3%; bleeding, 0.3%; and catheter occlusion, 0.3%. Catheter thrombosis was solved through drug therapy ***(figure 2)***.

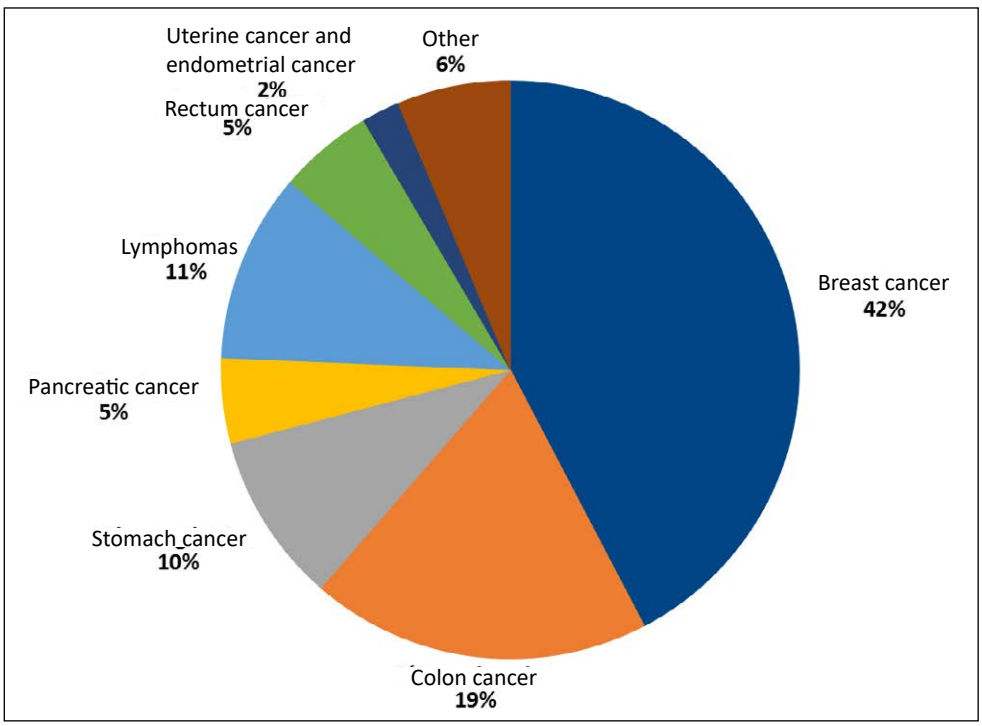

Figure 1. Cancer conditions that triggered the use of the Port-a-Cath® device.

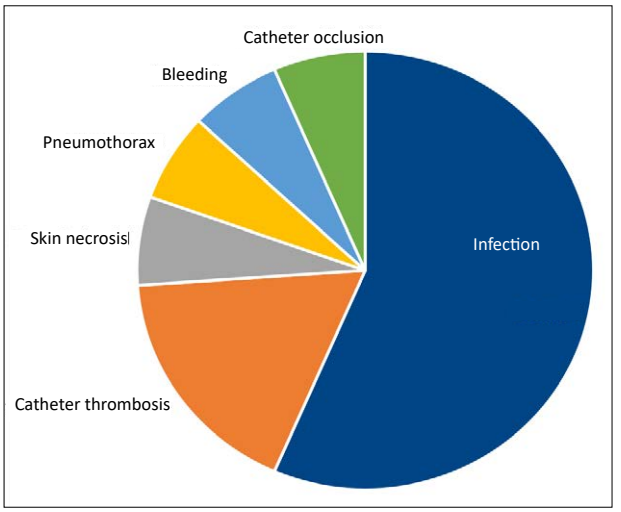

Figure 2. Complications after placing the Port-a-Cath® device.

DISCUSSION

Regarding the results shown in our new research, we can say that we are within a reasonable range of complications.

Compared to other studies like Koch et al.'s series (1996) of 1000 patients or Woloster et al.'s series (2004) of 519 patients (with rates of complications somewhere between 1% and 7%, respectively) our rate of 4.7% does not seem that far from these numbers.[3]

Also, we found series like Brothes et al.'s (1988) that revealed a rate of up to 4.9% of thrombotic events in a group of 329 patients. In our group we found a rate of catheter thrombosis of 0.8% most of which resolved with drug therapy.[3]

In studies like the one conducted by Kock et al. (1996), the rate of infections was 4.9%. However, this study also reported a rate of infections of 2.6%.[3]

In series like Johnson's the rates of pneumothorax and bleeding were somewhere between 0%-1.9% and 0%-3.6%, respectively.[11] In our study we found lower rates of pneumothorax and bleeding of 0.3% and 0.3%, respectively.

CONCLUSION

We have come to the conclusion that Port-a-Cath® venous access devices are permanent implants that are associated with a low rate of complications. Some of the most common ones are thrombosis and infection, which also have a low rate of occurrence.

Continuing medical education for both patient and healthcare team is associated with optimal care and, therefore, with the proper functioning of the Port-a-Cath® venous system. These devices are an excellent alternative to prolonged and repeated therapies in cancer patients due to their versatility, outpatient use, and quality of life they for the patients.

Indications, material selection, type of treatment, complications, and the cost-benefit ratio should be taken into consideration to improve the patient's quality of life.

Authors' contributions: All the authors contributed equally to develop the protocol, its application, and drafting of final report, and corrections.

Conflicts of interest: None whatsoever.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Original article Doi: 10.18004/sopaci.2022.diciembre.15

Clinical and epidemiological characteristics and surgical treatment of patientes with suspected hepatic hydatid cysts

Características clínicas, epidemiológicas y tratamiento quirúrgico de pacientes con sospechas de quistes hidatídicos hepáticos

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ABSTRACT

Introduction: Hydatid cyst is a chronic infectious, zoonotic and parasitic disease caused by Echinococcus granulosus. **Materials and methods:** Descriptive, retrospective, and prospective observational study, with analytical components, of patients over 18 years of age with suspected hepatic hydatid cyst who underwent surgery at the General Surgery Service of the Itauguá National Hospital, from January 2018 to November 2021. **Results:** wenty-two patients were included, 19 female and 3 male, with an average age of 57 years, the main reason for consultation was abdominal pain in 90% and digestive symptoms in 9.1%. The evolution time varies from 3 months to 1 year, the highest incidence was in San Pedro with 22.8% of cases. The main ultrasound findings correspond to Gharbi type II in 50%. Tomographically, the results were 50% CE1. Serology was positive in 27.3% of cases. 27.3% received preoperative treatment with albendazole. The main surgical procedure performed was pericystectomy in 59.1 of the cases. **Conclusion:** Hydatidosis is a zoonosis which is an important public health problem in South America, the highest prevalence is found in rural areas.It occurs in 90% of cases in the live.

Keywords: echinococcosis, hepatic hydatid cyst.

RESUMEN

Materiales y metodos: Estudio observacional descriptivo, de corte retro y prospectivo, con componentes analíticos, de pacientes mayores de 18 años con sospecha de quiste hidatídico hepático que fueron intervenidos quirúrgicamente en el Servicio de Cirugía General del Hospital Nacional de Itauguá, periodo enero 2018- noviembre 2021. **Resultados:** Se incluyeron a 22 pacientes, 19 de sexo femenino y 3 masculinos, con un promedio de edad de 57 años, el principal motivo de consulta fue dolor abdominal en 90% y síntomas digestivos en 9,1%. El tiempo de evolución varia de 3 meses a 1 año, la mayor incidencia fue en San Pedro con 22,8% de casos. Los principales hallazgos ecográficos corresponden a Gharbi tipo II en el 50%. Tomográficamente los resultados fueron 50% CE1. La serología resultó positiva en 27,3% de los casos. El 27,3% recibió tratamiento pre-operatorio con albendazol. El principal procedimiento quirúrgico realizado fue periquistectomía en el 59,1 de los casos. **Conclusion:** La Hidatidosis es una zoonosis el cual es un importante problema de salud pública en América del Sur, la prevalencia más alta se encuentra en las zonas rurales. Se presenta en el 90% de los casos en el hígado.

Palabras claves: equinococosis, quiste hidatídico hepático.

INTRODUCTION

Hydatid cyst is a chronic, zoonotic, and parasitic disease due to *Echinococcus granulosus*. The highest prevalence of hydatidosis in humans and animals can be found in the Mediterranean part of Europe, regions of Central and Southern Russia, Central Asia, China, Australia, South and North America, and East Africa.[1-2]

Echinococcus granulosus causes echinococcus cysts; *Echinococcus multilocularis* causes alveolar echinococcosis, and *Echinococcus vogeli*, causes the polychystic version. *Echinococcus granulosus* is responsible for 95% of the cases reported of human hydatidosis. Hydatid cysts can be found in all bodily tissues or organs of the human body being the liver (50% to 77%), lung (15% to 47%), spleen (0.5% to 8%), and kidney (2% to 4%) the organs that are most commonly damaged. Hydatid cysts are rarely found in the peritoneum (2%). [3]

This disease can be found worldwide. In our country is can be found in endemic regions and it is a disease of mandatory written reporting. The cycle of life of the parasite includes 2 hosts: the definitive—mainly the dog—where adult parasites often grow in the animal's bowels; and the intermediate host—often ovine—presenting as larvae. Man falls within the category of the latter as an incidental host. Approximately 80% of the pa-

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Date of reception: 28/06/22 - Date of approval: 07/11/22
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tients have 1 single organ damaged with one single cyst too. [4]

Its association with sex is indistinctive. It is associated with the cattle industry (growth of sheep, pigs, and caprines), poor infrastructure and health education, and low social and economic level (lack of drinking water). Its morbidity is significant, and onset can be through serious clinical syndromes with deadly outcomes if untreated; even with treatment, quality of life is often impaired. Mean postoperative mortality rate is 2.2%, and 6.5% of the cases relapse after surgery leading to long recovery periods. In addition, sequelae depend on the location of the cyst. Early diagnosis and management of echinococcosis and prevention are of paramount important to avoid high rates of mortality, disability, and greater cost for the states and the families since treatment is often expensive and complicated because it requires surgery and/or prolonged drug therapy courses.[5-6-7]

The most common symptoms of hepatic cysts include pain, palpable mass, nausea, vomiting, and anorexia. Pulmonary cysts can trigger cough, hemoptysis or paroxysmal cough. The most common complications can be the cyst rupture or its infection. Diagnosis of hydatidosis is based on the patient's epidemiological history, physical examination, imaging diagnosis, and serological tests. In the case of hepatic hydatidosis, the method of choice regarding diagnosis is ultrasound thanks to its higher specificity and sensitivity. The CT scan report should provide an analysis of the size, location (indicative of the corresponding hepatic segment), and the WHO classification of the cyst.[8-9]

Hydatidosis is responsible for much spending in treatments and economic losses especially in the farming industry in South America. These medical-financial data justified its inclusion in the World Health Organization (WHO) list of the 17 most spread tropical diseases whose control or elimination is planned by 2050. In Europe, the objective of the multicenter, prospective European Register of Cystic Echinococcosis (ERCE) is to optimize clinical treatment and guide the public health strategies thanks to epidemiological and clinical-biological data curated. The basic principlaes of treatment include eradicating the parasite inside the cyst, protecting the host against scolices, and the management of complications.

Medical therapy of hydatidosis consists of its preoperative, postoperative indications, and management; albendazole is the drug of choice used for treatment due to its low rate of adverse events. Also, it is spared as the single option for patients in whom surgery is ill-advised. For a long time, surgery has been the only treatment of hepatic hydatid cysts with a polarized technical dogmatic debate around it among the so-called conservative approaches. Current clinical data have allowed us to refine indications, technical options, and quality criteria of surgery that are now integrated into a multimodal therapeutic strategy including medical and endoscopic percutaneous treatments. [10]

Percutaneous techniques for the management of hydatidosis are PAIR and PEVAC, the treatment of choice for type 1 and type 2 cysts infected hydatid cysts, inoperable patients, pregnant women, and patients with multiple disseminated or symptomatic cysts. We should mention that the rate of overall complications associated with percutaneous drainage is somewhere between 15% and 40%.

The PAIR technique (acrostics) consists of an ultrasound-guided puncture of the cyst, aspirated hydatid fluid, injection of scolicidal agents, and re-aspiration of the solution without parasitic membrane aspiration; such technique is used in cysts < 6 cm, under local anesthesia, and via trans-costal incision. Half of the cystic fluid is aspirated. Afterwards, a biochemical test is performed to rule out the presence of bilirubinemia and viability of the parasite. Afterwards, a parasiticidal agent is injected—approximately one third of the cystic volume. Then, cystic content is re-aspirated after 20 minutes.

The percutaneous evacuation of cystic content (PEVAC) is used for cysts > 6 cm after the injection of the parasiticidal agent. A catheter is, then, inserted into the cystic cavity and left for gravity drainage for 24 hours. Afterwards, a cystography is performed through the catheter to eventually see biliary communication. In the absence of communication, absolute alcohol is injected and kept for 20 minutes. Afterwards, the volume injected is aspirated.

Surgery plus albendazole is the most effective treatment of hydatidosis with rates of healing over 90%. In symptomatic or complex cases (ruptured abdominal cavity, infection, bile duct opening or hepato-thoracic transit), the optimal therapy is surgery (whether conventional or laparoscopic). In asymptomatic patients, management depends on the type of cyst through a simple puncture for hepatic evacuation or resection although, over the past few years, percutaneous and laparoscopic techniques have improved substantially. The latter should observe the same safety aspects as the conventional technique. The best results and common use reduce contraindications like the cyst deep location or complex cystobiliary communications. Also, the surgical team should be experienced.

MATERIALS AND METHODS

This is an observational, descriptive, retrospective, and cross-sectional study of patients with suspected hepatic hydatid cysts treated with surgery at the General Surgery Unit of *Hospital Nacional de Itauguá*, Itaguá, Paraguay from January 2018 through November 2021.

Inclusion criteria: Patients over 16 years of age with suspected hydatid cysts. Patients of both sexes. Exclusion criteria: Patients with incomplete health records (clinical data, surgical data, imaging diagnosis, and anatomopathological examination).

Bioethical principles were observed: information was managed confidentially so patients could not be identified. No informed consent was ever required since data were collected from the patients' health records.

RESULTS

The study included a total of 22 patients with suspected hydatid cysts treated with surgery at the General Surgery Unit of *Hospital Nacional de Itauguá*, Itauguá, Paraguay from January 2018 through November 2021; 19 were women (86,3%) and 3 men (13.7%) with a mean age of 57.0 ±14.3 years.

With respect to the origin of the patients, it was confirmed that 22.8% of them came from San Pedro followed by Guaira, Misiones, and Central in 13.6%, respectively. ***(See figure 1)***

A total of 90% of the patients presented with abdominal pain accompanied by digestive symptoms like nausea, vomiting or anorexia present in 9.1% of the cases.

Auxiliary diagnostic methods showed the following ultrasound findings: Gharbi classification type I (31.8% of the patients), type II (50%), type III (9.1%), type IV (9.1%), and type V (0%). ***(See table 1)***

Findings on the CT scan were CL (4.5%), CE1 (50%), CE2 (27.3%), CE3 (9.1%,), and CE4 (9.1%) (Table 2).

Symptoms found were pain (present in 90.9% of the cases) followed by nausea (86.4%), and weight loss (63.6%). A total of

27.3% of the patients received preoperative treatment with albendazole as opposed to 72.7% who did not.

Regarding surgery, access route was laparotomy and laparoscopy in 50% and 50% of the patients, respectively. The surgeries performed were pericystectomy, detachment, hepatectomy, and segmentectomy in 59.1% 27.3%, 9.1%, and 4.5%, respectively.

Postoperative complications appeared in 36.3% of the cases: bleeding (5 patients), pneumonia (2 patients), and postoperative biliary fistula (1 patient). None of the patients included in this study died after the surgery performed due to suspected hydatid cyst.

Clinical (mortality, surgical complications, and relapse) and financial outcomes (surgical, postoperative, and overall cost) were similar for the surgeries performed through both conventional and laparoscopic surgery. However, there was much less postoperative pain, and both the LoS and the downtime were shorter for patients treated via laparoscopic surgery.

The serological test confirmed positive results in 27.3% of the patients only while most of them (72.7%) had a negative serological test. However, the anatomopathological examination confirmed the diagnosis of hepatic hydatid cysts in 68.2% of the cases.

Table 1. Ultrasound findings according to Gharbi classification. N = 22

Ultrasound classification	%
Gharbi I	31.8%
Gharbi II	50%
Gharbi III	9.1%
Gharbi IV	9.1%
Gharbi V	0

Table 2. Distribution of the population based on preoperative CT scan findings based on the WHO/IWG classification. N = 22

CT scan classification	%
CL	4.5%
CE1	50%
CE2	27.3%
CE3	9.1%
CE4	9.1%
CE5	0

DISCUSSION

Hepatic hydatid cysts are often found on the right lobe (56%) more frequently on its posterior-upper region, in hepatic segments VII and VIII of Couinaud classification. Most communicate with the biliary tree (60%) and are often single cysts (74%).[5]

The predominance of women affected is not consistent with the study conducted by Alises et al.[12] who stated that it mainly affected men < 40 years. However, it is consistent with the findings made by Flecha et al. who claimed that 64.7% of the study population were women.[13]

Hydatidosis can run asymptomatic and go unnoticed for the patient. However, in the presence of symptoms the most common of all are pain, palpable mass, jaundice, and fever like Alises et.al (12) were saying, which is consistent with the findings of our study since most patients presented with pain. Similarly, it is consistent with the study conducted by Mendoza Solis where the most common symptom was pain as well (52.6%).[14]

Ultrasound is still the imaging modality of choice to start examining patients with suspected hepatic hydatidosis. The study of choice for the early diagnosis of hepatic hydatidosis in symptomatic and asymptomatic patients should be sensitive, specific, affordable, and without adverse events. However, this does not mean that serological tests or other imaging modalities are not useful. It means that the decision to use them should be based on the patient's clinical signs and epidemiology, and on the ultrasound findings.

The serological test tested positive and negative in 27.3% and 72.7% of the patients, respectively. This is surprising taking into consideration that the anatomopathological diagnosis confirmed the presence of hydatid cyst in 68.2% of the cases.

The surgeries performed in the population were pericystec-

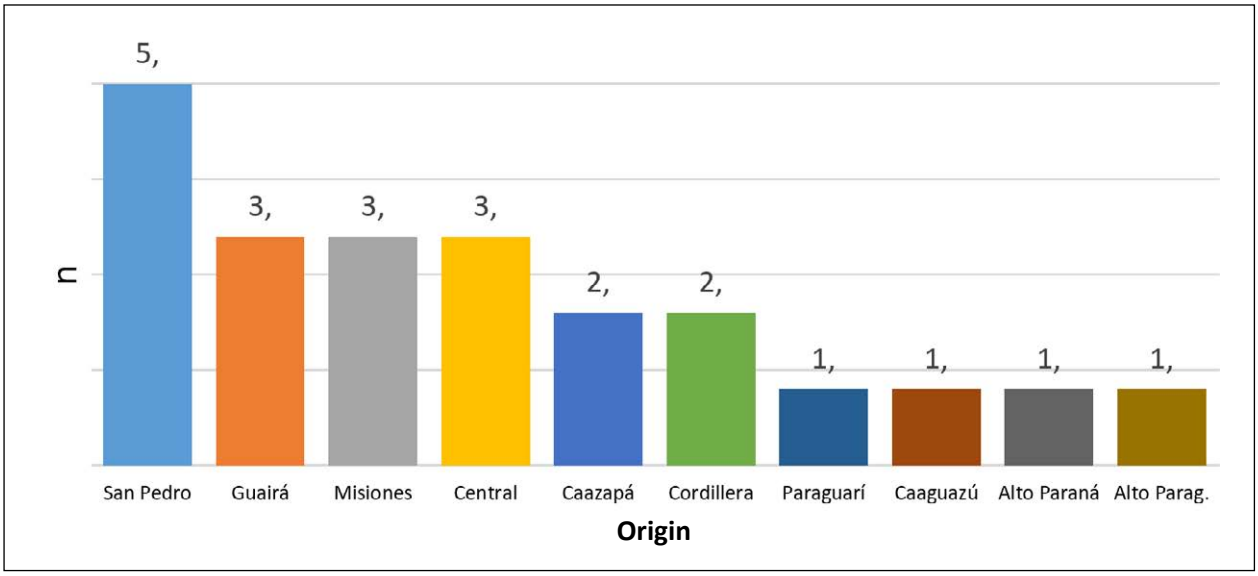

Figure 1. Distribution of the population based on origin. N = 22

tomy, detachment, and hepatectomy in 59.1%, 27.3%, and 9.1%, respectively. Surgical access route was laparotomy and laparoscopy in 50% and 50% of the cases, respectively. Other studies should be conducted to confirm the benefits derived from both techniques during or after surgery.

CONCLUSION

Hydatidosis is a zoonotic disease due to the parasite *Echinoccoccus granulosus.* It is a remarkable problem of public health in South America. The highest prevalence is found in rural areas. In 90% of the cases, it appears in the liver. In most cases, it is an incidental finding that is often asymptomatic. When symptoms become evident, they are often mild.

Out of the 22 study patients, 19 were women, and the mean age was 57 years old. Most patients came from rural areas, and 90% had abdominal pain as the main reason for consultation. The most common Gharbi type found on the ultrasound was Gharbi type 2. The most common CT finding was CE1. Surgery was performed in all the patients (laparotomic or laparoscopic) being pericystectomy the most common procedure used. Bleeding was confirmed in one third of the cases though no deaths were reported. Diagnosis was confirmed through serological test in one fourth of the cases, and through anatomopathological examination in two thirds of the patients.

Authors' contributions: All the authors contributed equally to develop the protocol, its application, and drafting of final report, and corrections.

Conflicts of interest: none whatsoever.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Original article Doi: 10.18004/sopaci.2022.diciembre.19

Impact on the training of resident physicians in general surgery due to the pandemic generated by the SARS-CoV-2 virus

Impacto en la formación de médicos residentes en cirugía general por la pandemia generada por el virus SARS-CoV-2

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ABSTRACT

Introduction: the training process of general surgery residents was globally affected by the SARS-CoV-2 pandemic and there is a need to reinvent itself with new training programs. The objective was to study the impact of the pandemic on the training of general surgery residents. **Materials and methods:** Observational study carried out at the Hospital de Clínicas de Paraguay, taking two groups: graduates (not affected by the pandemic) and residents (trained during the pandemic). **Results:** 46 respondents: 10 were graduates and 36 residents. The average number of minor surgeries and appendectomies performed by a graduate and a first-year resident went from 25.8 and 56.6 to 7.8 and 14.5, respectively. When comparing herioplasties and conventional cholecystectomies between graduates and second-year residents, they went from 42 and 55 to 20.3 and 21.1. 56.3% of residents did not take simulation courses, and all classes became virtual. **Conclusion:** the pandemic affected the training of residents, with a significant decrease in the volume of surgeries performed, from 50 to 75%. The increase in the use of virtual platforms helped to not interrupt the teaching-learning process.

Keywords: COVID-19, SARS-CoV-2, coronavirus infections, pandemics, general surgery, medical education, postgraduate programs

RESUMEN

Introducción: el proceso formativo de los residentes de cirugía general fue afectado a nivel global por la pandemia de SARS-CoV-2 y surge la necesidad de reinventarse con nuevos programas de formación. El objetivo fue estudiar el impacto de la pandemia en la formación de los residentes de cirugía general. **Materiales y métodos:** estudio observacional realizado en el Hospital de Clínicas de Paraguay, tomando dos grupos: egresados (no afectados por la pandemia) y residentes (formados durante la pandemia). **Resultados:** 46 encuestados: 10 fueron egresados y 36 residentes. El promedio de cirugías menores y apendicectomías realizadas por un egresado y un residente de primer año pasó de 25,8 y 56,6 a 7,8 y 14,5 respectivamente. Al comparar herioplastias y colecistectomias convencionales entre egresados y residentes de segundo año pasaron de 42 y 55 a 20,3 y 21,1. 56,3% de los residentes no realizó curso de simulación, y todas las clases pasaron a ser virtuales. **Conclusión:** la pandemia afectó la formación de los residentes, con una disminución importante en el volumen de cirugías realizadas, de un 50 a 75%. El aumento en la utilización de plataformas virtuales colaboro a no interrumpir el proceso enseñanza - aprendizaje.

Palabras clave: COVID-19, SARS-CoV-2, infecciones por coronavirus, pandemias, cirugía general, educación médica, programas de postgrado

INTRODUCTION

The SARS-CoV-2 pandemic has changed all human activities radically. This has also become evident in the healthcare sector, pedagogical activities organized, risk of contagion to the healthcare professional, less health professionals available, and fewer surgical patients taken care of. In addition, fewer surgeries have been performed, lengths of stay (LoS) have been shorter, and there have been less doctors on call, and less involvement in surgeries that are key to train residents not only in general surgery but also in other medical specialties. [1,2]

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The pandemic has arranged health professionals differently and with different scenarios. It has required dramatic changes, and impacted professionals in training (medical and nursing students, for example) by reducing their attendance to hospital in 83.86%; damage to residents—who have had to focused on call in 60% of the cases and these have become more spaced out in 18.82%—is not much lower. Also, they have had to limit their surgical training [3].

Back on March 10, 2022, the Paraguayan Ministry of Public Health and Wellbeing reported the very first case of SARS-CoV-2 in Paraguay. This event was followed by a national quarantine across the country that included social isolation, school and college lockdowns, and closures of centers with all sorts of social interactions. On the health level, the medical attention of patients with underlying diseases, severe or emergency cases was prioritized. Also, a team working system was organized to reduce the exposure of the treating personnel to the virus due to danger of mass contagion. [4]

It is important to understand and comprehend how the consequencies of the pandemic have affected the training of general surgeons regarding the need for looking for solutions and different ways of moving forward with the training process—learning, continuing medical educational in the COVID-19 era, and introduction of new techniques for the training process. Now the paradigm has changed, and the models of learning are not focused on surgical knowledge *per se* anymore. Instead, redistribution strategies should be developed for academic and practical activities not only to teach general surgery but also get residents involved and prepared for new non-surgical roles like pandemic healthcare response if the number of patients with COVID-19 goes off the charts again [1,2].

The objective of this investigation is to describe the impact or the consequencies of the SARS-CoV-2 pandemic in the training process of residents of I and II Chair of General Surgery at *Hospital de Clínicas* who were involved in the specialization course in General Surgery, FCM – UNA held in Asunción, Paraguay from March 2020 through February 2021.

MATERIALS AND METHODS

This is a descriptive, observational, quantitative, cross-sectional study with non-probabilistic sampling of consecutive cases. The target population was representative of postgraduates in general surgery and residents in general surgery, all from *Hospital de Clínicas* (I and II Chair of General Surgery).

Group #1—postgraduates—was elected since during their medical training, the SARS-CoV-2 pandemic was non-existent. On the contrary, group #2—residents—were actually affected by the pandemic during their medical training. The following inclusion criteria were used for the study: postgraduates from 2019 and 2020, and residents who were already working as residents of first, second, and third year.

Authorization was requested from the corresponding Heads of General Surgery (from I and II Chair of General Surgery) from the Faculty of Medical Sciences of the National University of Asunción, Paraguay so a survey could be submitted to postgraduates, residents, and obtain the corresponding data.

The data mining technique was a survey submitted through Google-meet platform. Survey was built around a questionnaire of open and closed questions of the study subjects, postgraduates, and general surgery residents. Survey was coded and loaded in an electronic spreadsheet (Excel, Microsoft), and then analyzed using descriptive statistics.

Ethical principles were observed in this study at all times. Since it was a prospective study, primary sources or data were used in most of the information collected. The principle of confidentiality of the study subjects was observed too. Afterwards, a copy with the results was delivered to the different heads of the different surgical units that participated in the surveys in the first place.

RESULTS

A total of 46 surveys were submitted (26 to women and to 20 men). Out of the total, 10 were postgraduates (group #2), and 36 were residents (group #2) ***(see table 1)***.

When asked, postgraduates said that all the theoretical and practical classes of their residency program in general surgery took place on-site unlike the residents' classes who claimed that 100% of their theoretical activities were conducted online.

A total of 93% of respondents used an online platform for the entire asynchronous training process (Classroom), while Google-meet® and Zoom® platforms were used for the synchronous theoretical classes. We should mention that 75% of the residents were not involved in any previous training programs of the aforementioned platforms.

The mean number of surgeries performed was significantly lower during the pandemic. From a mean number of 55 open cholecystectomies performed by postgraduates down to 21.1 performed by second-year residents. Same thing happened with other surgeries like appendicectomies, from a mean number of

Table 1. Demographic characteristics of residents and postgraduates

Group	N	%	Mean age
First-year residents	11	23.9%	25.5 years old
Second-year residents	13	28.3%	26 years old
Third-year residents	12	26.1%	27.2 years old
Postgraduates	10	21.7%	28.8 years old
Total	**46**	**100%**	**-**

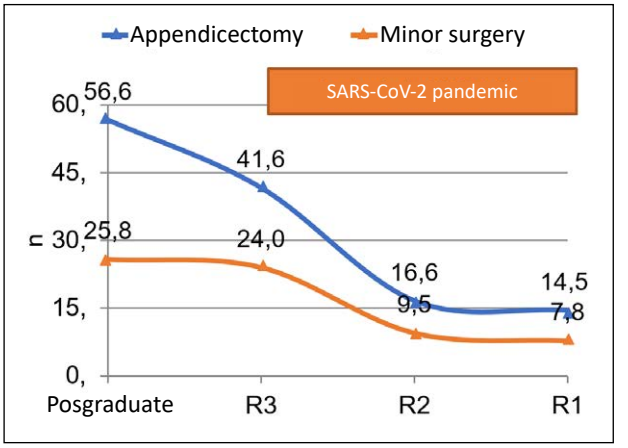

Figure 1. Mean surgeries performed by general surgery postgraduates and residents. Note: postgraduates were not affected by the SARS-CoV-2 pandemic. R3, third-year resident; R2, second-year resident; R1, first-year resident. N = 46

Table 2. Mean surgeries performed by general surgery postgraduates and residents at *Hospital de Clínicas,* Asunción, Paraguay

Type of surgery	R1	R2	R3	Postgraduates
Minor surgery	7.8	9.5	24	25.8
Appendicectomy	14.5	16.6	41.6	56.6
Hernioplasty	*	20.3	22	42
Conventional cholecystectomy	*	21.1	25.6	55
Laparoscopic cholecystectomy	#	#	35	40
Colectomy	#	#	22.1	23.3
Gastrectomy	#	#	1	1
Thoracotomy	#	#	0.5	0.6

*Note: R1, first-year resident; R2, second-year resident; R3, third-year resident. * Non eligible procedure for first-year residents according to the program. # Non eligible procedure for first- or second-year residents according to the program.*

56.6 procedures performed by postgraduates down to 41.6 performed by third-year residents, and 14.5 by first-year residents ***(see table 2 and figure 1)***.

A total of 56.3% out of all respondents did not do any simulation training. The remaining 43.7% did so in simulation models designed to train suture techniques in biological tissues (porcine tissue) and/or practice with laparoscopic training boxes to acquire the skills needed to perform laparoscopies.

During the pandemic, 95% of respondents said they participated in courses, congresses and/or online webinars on surgical updates.

When the use of personal protective equipment (PPI) was studied, all residents claimed they used biological biosafety PPIs. The following data on the type of mask used were obtained: KN95 in 62.2% of respondents, N95 in 16.2%, and surgical masks in 21.6%. A total of 56.8% of the residents surveyed became infected with SARS-CoV-2.

DISCUSSION

The SARS-CoV-2 pandemic has changed surgery units dramatically from fewer surgeries being performed just by prioritizing emergency surgeries only to rearranging the entire bed system. Also, due to the patients' fear of contagion of going to health centers seeking medical attention. [1,3]

Regarding the introduction of information and communication technologies (ICT), the department of training, as it is the case with all universities nationwide, used platforms to move forward with the process of training—learning. This means that the department of training had to reinvent itself to move forward with the transmission and transfer of knowledge. Still, a significant imbalance was seen between practical and theoretical activities because although students had the opportunity to participate in their postgraduate classes, courses or congresses online, they could only do so in their theoretical postgraduate classes. [1,5,6]

Regarding the simulation courses that became necessary to replace practical activities and surgical skill training, according to respondents, 56.3% of the residents did not conduct any simulation courses, which damaged the training process. However, the study conducted by Uribe discusses the creation of several simulation centers introduced by the departments of training to alleviate the deficit. [5]

When the mean number of surgeries performed by postgraduates and residents was compared, a lower number of appendicectomies was seen (up to 75%) when postgraduates were compared to first-year residents. Hernioplasties and conventional cholecystectomies performed between postgraduates and second-year residents were compared too. Here there was, also, an additional reduction of 50%. This reduction was seen everywhere and affected the residents' training mainly. As a matter of fact, in Chile, Uribe et al. say confirmed that, with the pandemic, surgeries dropped 90% in some residency programs.[5] Also, according to Rabe et al., the way to assess students changed too. Transition from personal on-site to online examinations made skills much more difficult to assess due to the lack of real-world demonstrations of the concepts and skills learned. [6]

In our study, 56.8% of the residents got infected and had to quarantine, which extended the no contact periods with the patients even further and reduced the number of surgeries performed. Brooks et al. say that quarantine was associated with negative psychological effects like post-traumatic stress syndrome, confusion, and even wrath. [7]

CONCLUSION

Before the pandemic, classes of the general surgery residency program were on-site. After the pandemic, they all became online classes.

The mean number of appendicectomies performed dropped down to 75% when, prior to the pandemic, general surgery postgraduates were compared to first-year residents who had their medical training during the pandemic. Overall, the number of all types of surgeries dropped dramatically.

Less than half the residents used simulations like their learning method during the pandemic performing sutures in ex-vivo tissues in anatomical models or in laparoscopic training boxes.

Almost all respondents participated in online courses, congresses or webinars during the pandemic.

A total of 80% of respondents used N95 or KN95 masks during the pandemic, and 56.8% of the residents who responded to the survey became infected with SARS-CoV-2 (COVID-19).

Authors' contributions: All the authors contributed equally to develop the protocol, its application, and drafting of final report, and corrections.

Conflicts of interest: None whatsoever.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Original article Doi: 10.18004/sopaci.2022.diciembre.23

Complications of laparoscopic video appendectomy in the Central Hospital of the Social Security Institute in the period from January to December 2021

Complicaciones de la apendicectomía video laparoscópica en el Hospital Central del Instituto de Previsión Social en el periodo de enero a diciembre del año 2021

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ABSTRACT

Introduction: Videolaparoscopic appendectomy is a safe option for the etiological diagnosis and treatment of acute appendicitis. The objective of the research is to determine the frequency of complications of videolaparoscopic appendectomy in patients undergoing surgery at the Central Hospital of the Social Security Institute in the period from January to December 2021. **Materials and methods:** It is an observational, descriptive, retrospective, cross-sectional, non-probabilistic study of consecutive cases. Reviews of operative records of patients undergoing videolaparoscopic appendectomy, older than 16 years, including both sexes, were carried out at the Central Hospital of the Social Security Institute from January to December 2021. **Results:** 62 patients were studied, 54.8% female and 45.2% male, with an average age of 34 years, a range of 16 to 90 years. A 4.8% rate of complications was reported: surgical site infection (3.2%) and hemoperitoneum (1.6%). The average hospital stay was 2.2 days.

Conclusion: Videolaparoscopic appendectomy is a minimal access surgical technique that has shown a low rate of complications: low rate of surgical site infection, and short hospital stay.

Keywords: acute appendicitis, videolaparoscopy, complications.

RESUMEN

Introducción: La apendicectomía videolaparoscópica es una opción segura para el diagnóstico etiológico y el tratamiento de la apendicitis aguda. El objetivo de la investigación es determinar la frecuencia de complicaciones de la apendicetomía videolaparoscópica en pacientes sometidos a cirugía en el Hospital Central del Instituto de Previsión Social en el periodo de enero a diciembre del año 2021. **Materiales y métodos**: Es un estudio observacional, descriptivo, retrospectivo, de corte transversal, no probabilístico de casos consecutivos. Se realizó revisiones de fichas operatorias de pacientes sometidos a apendicetomía videolaparoscópica, mayores a 16 años, incluyéndose ambos sexos, en el Hospital Central del Instituto de Previsión Social de enero a diciembre del 2021. **Resultados:** Se estudiaron 62 pacientes, 54,8% de sexo femenino y 45.2% de sexo masculino, con una edad promedio de 34 años, un rango de 16 a 90 años. Se informó una tasa de 4,8% de complicaciones: infección del sitio quirúrgico (3,2%) y el hemoperitoneo (1,6%). El promedio de estancia hospitalaria fue 2,2 días. **Conclusión**: La apendicetomía videolaparoscópica es una técnica quirúrgica de acceso mínimo que demostró una baja tasa de complicaciones: baja tasa de infección del sitio quirúrgico, y baja estancia hospitalaria.

Palabras clave: apendicitis aguda, videolaparoscopía, complicaciones

INTRODUCTION

Acute appendicitis is the inflammation of the vermiform appendix and the leading cause of acute surgical abdomen. Between 5% and 15% of the overall population will develop acute appendicitis at some point in their lives being more common during the second and third decades of life.[1]

The types of acute appendicitis that exist based on the stage of the disease when they are treated can be congestive or inflamed, phlegmonous or suppurative, gangrenous or necrotic, and perforated appendicitis.[2]

Surgical access can be via video laparoscopy or conventional surgery. Nonetheless, there is controversy on which of the two methods achieves best results.[3] Surgery is believed to be associated with shorter surgical times and less risk of intra-abdominal abscesses. However, the advantage of the laparoscopic approach is that both the length of stay (LoS) and the downtime are shorter, the rate of wound infections is lower, there is less postopera-

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Date of reception: 12/08/2022 - Date of approval: 12/11/2022
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tive pain, and early digestive tolerance.[4]

Other advantages have been described associated with the laparoscopic approach like the low rate of crossover to open surgery (need for laparotomy). Also, its role is important as diagnostic method in cases of suspected acute abdomen since it provides us with a full image of the abdominal cavity.[1]

Video laparoscopy can reduce the number of white laparoscopies in patients with suspected acute appendicitis to the point of reducing unnecessary appendectomies from 10% down to 1%.[5,6]

The objective of this study is to determine the rate of complications of video laparoscopic appendectomy in patients treated with surgery at *Hospital Central del Instituto de Previsión Social*, Asunción, Paraguay from January 2021 through December 2021. Also, to determine sex-based distribution, the different types of complications found, the mean length of stay (LoS), and the patients' comorbidities.

MATERIAL AND METHODS

This is a descriptive, observational, retrospective, and cross-sectional study with non-probability sampling of consecutive cases. This was a review of the medical records of patients over 16 treated with video laparoscopy with clinically confirmed or suspected acute appendicitis collected at our center from January 1, 2021 through December 31, 2021.

Inclusion criteria were age > 16 years (no upper limit was established), both sexes, and patients appendectomized due to early suspicion or after intraoperative diagnosis of acute appendicitis. Exclusion criteria were age < 16 years, indication for appendectomy for other causes or incomplete medical records.

The variables used in the study were: age, sex, comorbidities, length of stay (LoS), type of appendicitis, and the complications described. To study variables, data were registered in an electronic Microsoft Office Excel 2016 spreadsheet and submitted for statistical analyses.

On the ethical considerations: both the privacy and confidentiality of the patients' identity on the medical records studied were observed at all times.

RESULTS

The sample included 62 patients treated with acute appendicitis through video laparoscopy at the aforementioned health center from January 2021 through December 2021. A total of 45.2% of the patients were men while 54.8% were women. The median age of trial participants was 34 years old (range, 16 to 90 years). The mean length of stay (LofS) was 2.2 days (range, 1 to 3 days).

Regarding the comorbidities of the study patients, arterial hypertension, diabetes mellitus, and asthma were predominant in 22.5%, 8%, and 8%. Other baseline conditions associated with these patients were hypothyroidism, atrial fibrillation, and obesity amounting to 3% of the study population.

The following were the rates of occurrence of the types of acute appendicitis ranked from highest to lowest: acute phlegmonous (50%), gangrenous (38.8%), and congestive appendicitis (11.2%) ***(table 1 and figure 1)***.

One of the key findings of the study was a 4.8% rate of postoperative complications associated with video laparoscopy appendectomy that corresponded to surgical site infections (3.2%), and hemoperitoneum due to metal clip displacement (1.6%).

Table 1: Classification of acute appendicitis based on intraoperative findings

Acute appendicitis	N	%
Congestive	7	11.2%
Phlegmonous	31	50%
Gangrenous	24	38.8%
Total	**100**	**100%**

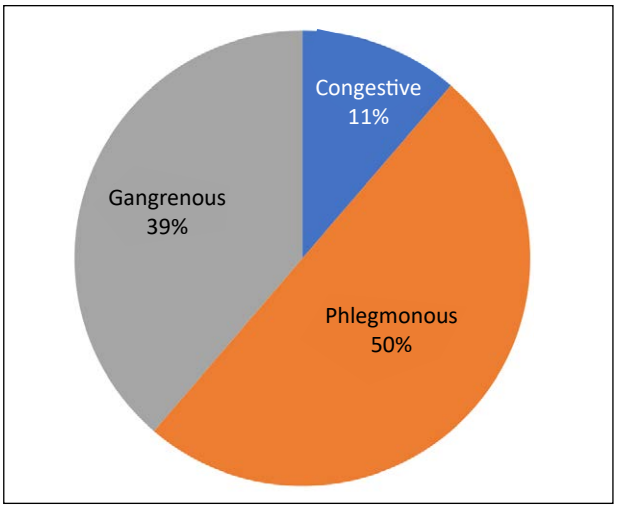

Figure 1. Types of appendicitis based on the rate of appearance found in the study. (N = 62)

DISCUSSION

In most studies conducted over the past 10 years like the series conducted by Rivera Díaz, both retrospective and prospective, results favorable to video laparoscopic appendicitis were seen since it reduces postoperative pain, trauma, and length of stay (LoS). Also, it provides full images of the abdominal cavity and better management of the tissues, reduces the rate of postoperative infections, and provides better cosmetic results.[7,8]

Regarding the studies conducted by Mosquera et al. and published in *Revista Colombiana de Cirugía* the rate of postoperative complications was 12% in cases treated with video laparoscopic appendectomies. In our study, a lower rate of complications of 4.8% was seen.[8]

In the study conducted by Mosquera et al. the rates of surgical site infections, hematomas, bowel obstructions, and residual abscesses were 1.1%, 4%, 2.2%, and 1.1%, respectively. However, these rates can be even higher. However, in our study, a 3.2% rate of surgical site infections was found plus a 1.6% rate of hemoperitoneum, although no other complications were found.[8]

We found publications like the ones conducted by Mosquera, Ortega, and Hellberg that attribute a low rate of infectious complication to video laparoscopic appendectomy compared to open surgery since the appendix is extracted inside the trocars and often does not have direct contact with the edges of the wound.[8,9,10]

Length of stay (LoS) in all groups was short with 6-hour stays in the study conducted by Mosquera due to the implementation of outpatient appendectomies in non-complicated cases. This study reported 1-, 2- or 3-day hospital stays based on the opera-

tive finding with mean lengths of stay (LoS) of 2.2 days.[8]

In several studies like in the Cochrane review there is a clear tendency that favors laparoscopic over conventional appendectomy, especially in young women in their reproductive years, in cases when diagnosis is not clear, and in obese patients.[11,12,13]

A controversial issue here has to do with the formation of intra-abdominal abscesses after laparoscopic approach, which has been described in some investigations. Some series report more complications associated with video laparoscopic appendectomies, above all, perforated appendicitis, reported in up to 24% of the cases compared to 4.2% of open appendectomies.[11,14,15] Mechanisms involved in its formation are described like the spread of the infectious process when performing pneumoperitoneum, the entire intraperitoneal procedure unlike what happens with open surgery.[16] However, in our series, these complications were not seen.

One of the study limitations is that pathology findings were not associated with the results. However, this was due to the fact that an attempt was made to find the rate of complications associated with the surgical procedure (video laparoscopy) not diagnosis (acute appendicitis or not).

CONCLUSION

A total of 54.8% of the 62 patients treated with video laparoscopy were women with a mean age of 34 years. The mean length of stay (LoS) was 2.2 days.

The most common comorbidities reported were arterial hypertension, and diabetes mellitus.

Based on the operative findings, the most common type of acute appendicitis found was phlegmonous (50%) followed by gangrenous (38.8%), and congestive (11.2%).

A 4.8% rate of postoperative complications was reported: surgical site infections (3.2%), and hemoperitoneum (1.6%)

Authors' contributions: All the authors collaborated drafting the manuscript, searching, and collecting data, making a critical review of the manuscript, and approving its final version for publication.

Conflicts of interest: none reported.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Case report Doi: 10.18004/sopaci.2022.diciembre.26

Complete intestinal occlusion due to plastered Meckel's diverticulitis

Oclusión intestinal completa por diverticulitis de Meckel emplastronada

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SUMMARY
The most common congenital gastrointestinal anomaly is Meckel's diverticulum, it is a true diverticula, because it contains all the layers of the intestine. It is usually asymptomatic. The diagnosis in the remaining 80% is incidental and is made by surgical findings. It has a complication risk of 2-40%, the most frequent being hemorrhage, intestinal obstruction and diverticulitis. The occlusive form of presentation is rare and requires a high index of suspicion.
Keywords: Diverticulum; Meckel; Occlusion.

RESUMEN
La anomalía congénita más común gastrointestinal es el divertículo de Meckel, es un divertículo verdadero, ya que contiene todas las capas del intestino. Generalmente es asintomático. El diagnóstico en el 80 % restante es incidental y se hace por hallazgos quirúrgicos. Tiene un riesgo de complicación de 2-40%, siendo las más frecuentes la hemorragia, la obstrucción intestinal y la diverticulitis. La forma oclusiva de presentación es infrecuente y requiere un elevado índice de sospecha
Palabras clave: Divertículo; Meckel; Oclusión.

INTRODUCTION

The incidence rate of Meckel's diverticulitis in the overall population is between 1% and 2%. Clinical signs appear in 20% of the cases. Diagnosis—in the remaining 80% of the cases—is purely incidental and achieved through surgical findings. It has been reported in up to 2% of the autopsies. [1,2] It is the most common GI tract disorder, and consists of the remnant of the vitelline duct proximal segment (omphalomesenteric). [3] It can remain asymptomatic or present with different signs and symptoms. [4] In adults, it is often not taken into consideration regarding differential diagnosis due to the lack of suspicion and complexity regarding detection. [5] The most common complications are bleeding, obstruction, perforation or diverticular inflammation. [6] Small bowel obstruction due to Meckel's diverticulitis has been reported in older children and adults. [7] Overall, this particular variety is rare. It poses a serious threat, requires a high index of suspicion, and the necessary expertise from the treating surgeon. [8] These elements motivate the presentation of this case report to describe the clinical presentation and surgical characteristics of mechanical bower obstruction due to Meckel's diverticulitis in an adult.

CASE REPORT PRESENTATION

This is the case of a 30-year-old man who presents to the ER with pain of 3-day evolution followed by abdominal distension, nausea, and repeat vomiting. Twenty-four hours prior to admission he reports constipation and gases also feeling feverish twice. The patient's only past surgical history includes one open appendicectomy 2 years ago. The abdominal physical examination reveals asymmetry due to McBurney's point appendicectomy scar. The abdomen looks distended, painful over the right iliac fossa with defense and pain to decompression and increasing hydro-aerial noises with metal timbre. Digital rectal exam without specific findings. Lab test results reveal leukocytosis, neutrophilia, hemoglobin, and hematocrit levels of 18 000/µL, 95%, 16.4 mg/dL, and 47%, repectively. The abdominal x-ray performed confirms the presence of central dilated thin loops with multiple hydro-aerial levels. Exploratory laparotomy is indicated with diagnosis of complete bowel occlusion due to probable bands and adherences.

The surgery performed via supra-para-infraumbilical approach confirms the presence of plastic process with compromise of thin loops and epyplon, and adherences to the sigmoid colon. Blunt dissection maneuver is attempted, and a transition region is confirmed 140 cm away from the ileocecal valve and 180 cm from the fixed bowel loop in the thin loop antimesenteric border where there is evidence of inflamed diverticulum with necrotic core and fibrin adherences ***(Figure 1)***. Approximately 10 cm of thin loops are resected followed by manual termino-terminal anastomosis ***(Figure 2)***.

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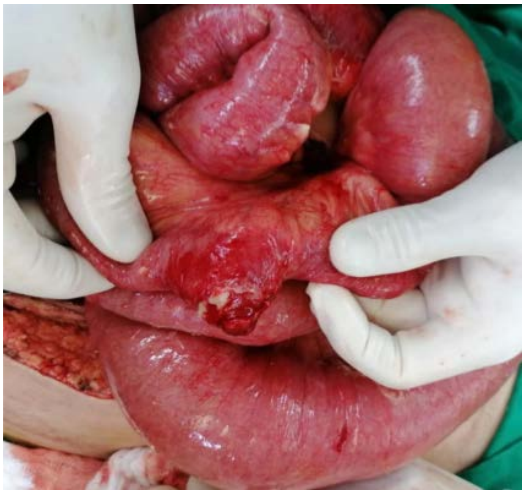

Figure 1. Inflamed diverticulum with necrotic core and fibrin adherences.

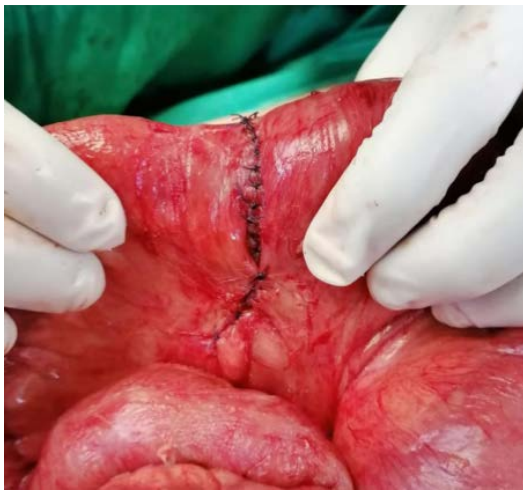

Figure 2. Termino-terminal ileum-ileal manual anastomosis.

Histological study reveals the presence of a small bowel segment with wall evagination showing all components surrounded by intestinal epithelium with necrotizing acute transmural inflammatory process perforating the wall consistent with true diverticulum (acute transmural diverticulitis with peritonitis).

At the hospital ward, patient's progression was good, and he was discharged 5 days after hospitalization with outpatient follow-up.

DISCUSSION

Meckel's diverticulitis appears in the antimesenteric border of distal ileum at an approximate distance of 30 cm to 60 cm from the ileocecal valve. However, cases of up to 180 cm have been reported. (1,2). Onset is often asymptomatic. These are some of the complications that have been reported: GI bleeding due to the presence of gastric or ectopic pancreatic tissue, bowel tumors like GI stromal tumors, bowel obstruction, perforation or diverticular inflammation (3,4).

Obstructive symptomatology is the second most common way of presentation. The mechanisms of obstruction are varied like invagination, volvulus, internal hernia, diverticulitis with adherences, mesodiverticular band, foreign body impacted in the diverticulum or inclusion of the diverticulum in a true knot formed between the ileum and the sigmoid colon. (5) The case presented here was due to diverticulitis with plastered adherences to sigmoid colon. Diagnosis is rarely achieved in the postoperative period and can only be achieved with guarantess if the diverticulum is seen at the obstruction site. (6) As in the case presented here where diagnosis of bowel occlusion was achieved no Meckel's diverticulitis was suspected as the main cause, and diagnosis was achieved during surgery. The difficulty with preoperative diagnosis is not only the result of symptoms overlapping with other conditions, but also due to the difficulty trying to identify Meckel's diverticulitis in the imaging modalities. (7) Treatment should be surgical by resecting the diverticulum with a small safety margin.(8) In the case presented here, bowel occlusion symptoms, surgical finding of Meckel's diverticulitis in a position further away than usual (at 140 cm from the ileocecal valve), and contact with sigmoid colon, it was deemed necessary to resect 10 cm of thin loop leaving the bowel tissue without inflammatory compromise with further ileum-ileal anastomosis.

We conclude that Meckel's diverticulitis has very many different ways of clinical-radiographic presentation, which complicates its diagnosis. Also, we submit that bowel occlusion due to Meckel's diverticulitis is a cause for occlusive syndrome that should be taken into consideration while performing surgery. Therefore, the general surgeon should be ready to face it with updated knowledge.

Conflicts of interest: None whatsoever.

Authors' contributions: All the authors collaborated looking for information, collecting data, drafting the manuscript, critically reviewing it, and approving its final version.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Case report Doi: 10.18004/sopaci.2022.diciembre.28

Recurrence of gallbladder adenocarcinoma in laparoscopic trocar port. A case report

Recidiva de adenocarcinoma vesicular en puerto de trocar laparoscópico. Reporte de un caso

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ABSTRACT
Gallbladder cancer is an incidental finding in 0.5% to 2.3% of all cholecystectomies for gallstones. It should be suspected in any tumor on the trocar port scars. Postoperative histopathological follow-up is important for diagnosis. We present the clinical case of a patient who underwent laparoscopic cholecystectomy 18 month previously, with recurrent umbilical tumor due to gallbladder cancer.

Keywords: Gallbladder Neoplasms, metastasis, laparoscopy, Recurrence

RESUMEN
El cáncer de vesícula es un hallazgo incidental en el 0,5% a 2,3% de todas las colecistectomías por litiasis vesicular. Se debe sospechar en toda tumoración sobre las cicatrices de puertos de trocares. El seguimiento histopatológico postoperatorio es importante para el diagnóstico. Se presenta el cuadro clínico de un paciente sometido a colecistectomía laparoscópica previa (18 meses), con tumoración umbilical recidivante por cáncer de vesícula.

Palabras clave: Neoplasias de la Vesícula Biliar, Metástasis, Laparoscopía, Recurrencia

INTRODUCTION

The rate of gallbladder cancer is between 0.5% and 2.3 % of all cholecystectomies performed due to vesicular lythiasis.[1,2,3] Preoperative diagnosis is difficult to achieve because no specific symptoms can be found. Therefore, diagnosis is achieved through anatomopathological examination.[1,2] One of the rarest complications in laparoscopic cholecystectomy is metastatic seeding of peritoneal implants in laparoscopic ports.4 This clinical entity is exclusive of laparoscopic surgery.[1,2,3] The way of presentation is the appearance of a tumor on painless previous scars, without obstructive symptoms. Differential diagnosis is needed in the presence of abdominal wall hernias and primary neoplastic diseases.[5] The most widely accepted mechanisms of tumor spread through trocar port sites are gallbladder perforations, tumor cell spreads due to the action pneumoperitoneum, the chimney phenomenon, and extraction without gallbladder bag.[3,6]

CASE REPORT PRESENTATION

This is the case of a 59-year-old man who presented with pain around the umbilical region of 3-day evolution. Patient had not been radiated. Pain partially recedes with common analgesics. The patient complains of constipation (though not of gases) of 3-day evolution, no nausea or vomiting. The physical examination reveals the presence of an umbilical tumor of 15 cm of maximum diameter with erythematous skin and inflammatory changes, irreducible, incoercible, painful to superficial palpation, with mate sound, without variation with the Valsalva maneuver, and scarce hydro-aerial noises on the tumor ***(see Figure 1)***.

The patient's past medical history is having been the carrier of such painless tumor ("hernia") for the past 6 months with rapid and progressive growth.

Also, he says that the underwent a laparoscopic cholecystectomy 18 months ago at a different center without postoperative follow-up.

Additional diagnostic examinations were conducted: the abdominal x-ray performed in the standing position revelaed no signs of bowel occlusion. The soft tissue ultrasound performed revealed the presence of an umbilical hernia with con-

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Date of reception: 07/06/2022 - Date of approval: 18/09/2022
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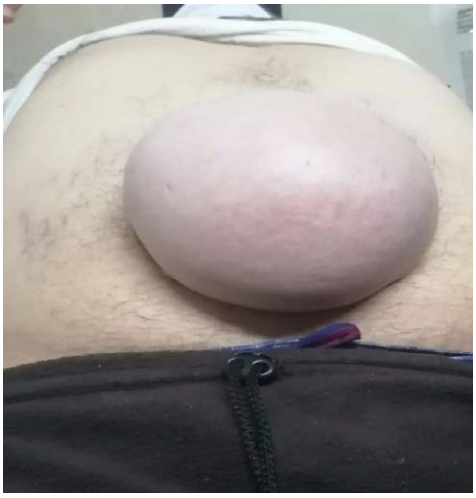

Figure 1. Patient with irreducible, incoercible umbilical tumor with inflammatory signs.

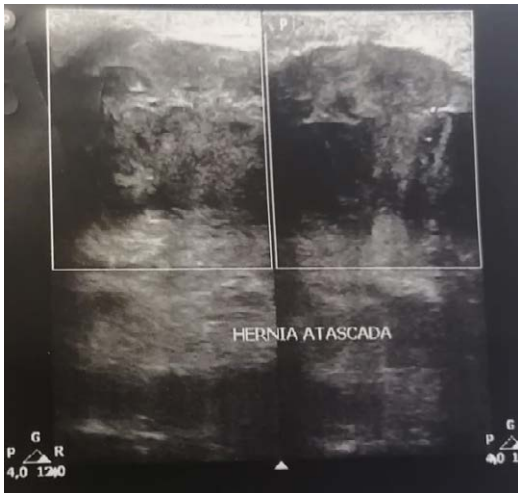

Figure 2. Soft tissue ultrasound showing a left para-lateral umbilical hernia with content blockage.

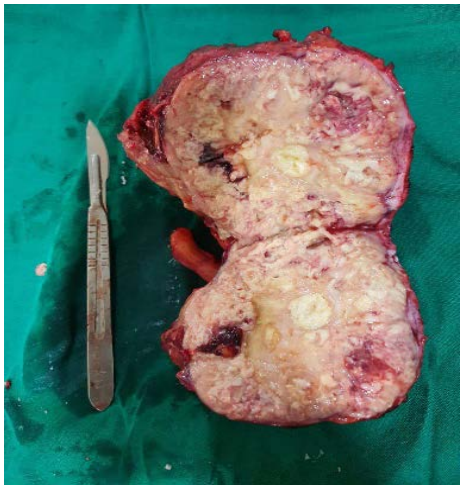

Figure 3. Resected surgical piece.

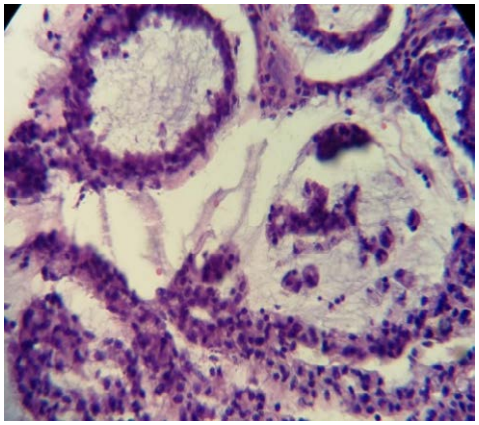

Figure 4. Anatomopathological features of the tumor. Atypical cellular nuclei with scarce cytoplasm making up the glandular lumen (Courtesy of Dr. Rocio Rizzi, Anatomical Pathology Unit, Itauguá National Hospital).

tent blockage of left para-lateral location suggestive of left colon with significant parietal and hypoechogenic swelling. Vascular pattern was seen when the color Doppler ultrasound was used ***(see Figure 2)***.

The exploratory laparotomy performed revealed the presence of a solid petrous tumor in the periumbilical region of 15 cm x 12 cm x 10 cm in size whose spread was limited in depth to the skin, and the subcutaneous cellular tissue. The aponeurosis of the anterior sheath of rectus, anterior rectus muscle, and parietal peritoneum without invasion of the cavity or any loop adherences was confirmed as well. Large tumor resection was performed with en bloc resection of rectum muscles. Abdomen remained opened using the Bogotá bag technique with abdominal wall deficit of nearly 15 cm x 12 cm ***(see Figure 3)***. Afterwards, treatment with VAC-type negative pressure system was used.

Pathology report confirmed the presence of an abdominal wall tumor with compromise of fibroadipose and musculoskeletal tissue due to moderate-to-poorly differentiated infiltrating adenocarcinoma (grade 2-3) of 15 cm of maximum diameter with extensive areas of necrosis, lymphovascular emboli, and perineural invasion. Finding was compatible with tumor of vesicular origin from previous surgery ***(see Figure 4).***

The anatomic pathology correlation with previous cholecystectomy was established. The patient had not the pathology report after failing to attend his postoperative monitorization follow-up that already reported on the presence of a 5.5 cm infiltrating adenocarcinoma of vesicular body. Extensive poorly differentiated areas with infiltration of all layers of vesicular walls up to the perimuscular fibroconnective tissue were described. These were located, at least, 1 mm away from the hepatic bed. No serous invasion was observed whether vascular or perineural. Stage pT2b.

DISCUSSION

Metastasis of gallbladder cancer to umbilical trocar port sites is rare[1,2,3], and diagnosis should be achieved through anatomopathological examination[2]. In the presence of suspected preoperative gallbladder cancer, the use of videolaparoscopy approach

is contraindicated.[1,2,3] On the other hand, differential diagnosis is important with other tumors of the abdominal wall[5].

This case was highly suggestive of para-umbilical hernia with content blockage, not tumor relapse. Histopathological follow-up of cholecystectomy and early procedures reduce the appearance of peritoneal seeding4 that was not performed on this patient since he never went to any postoperative follow-ups.

Implants in trocar port sites take between 2 weeks and 4 years before they make their appearance since the early procedure. Their appearance means advanced disease.[4,6] Treatment is surgical with wide tumor resection that improves the patient's quality of life but does not change prognosis or survival.[1,2,6]

Authors' contributions: MAAW: study idea, data collection and mining, case report preparation, study design, critical review of the manuscript and final approval of case report. GIPG: study design, data assessment, case report review and final approval. CPB: study idea, data and clinical health record curation, manuscript critical review and final approval. The authors did not declare any conflicts of interest regarding this manuscript.

Conflicts of interest: none reported.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Case report Doi: 10.18004/sopaci.2022.diciembre.31

Mediastinal ectopic parathyroid adenoma. A case report

Adenoma paratiroideo ectópico mediastinal. A propósito de un caso

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ABSTRACT
Primary hyperparathyroidism is caused by increased secretion of parathyroid hormone and was first described in 1930. Eighty percent are caused by a benign parathyroid adenoma, about 16% may present as ectopic. A 39-year-old female with multiple urinary tract infections, urolithiasis, hypercalcemia and increased parathyroid hormone. Gammagram showed ectopic parathyroid adenoma in superior mediastinum, by transverse cervicotomy, median sternotomy and gamma probe, the lesion was resected without eventualities.

Keywords: parathyroidectomy, hyperparathyroidism, ectopic parathyroid, mediastinal parathyroid.

RESUMEN
El hiperparatiroidismo primario es causado por el aumento de la secreción de paratohormona, y se describió por primera vez en 1930. 80% de los casos son causados por un adenoma paratiroideo benigno y hasta el 16% pueden presentarse como ectópico. Femenina de 39 años, con multiples infecciones urinarias, urolitiasis, hipercalcemia y paratohormona aumentado. Gammagrama demostró adenoma paratiroideo ectópico en mediastino superior, mediante cervicotomía transversa, esternotomía media y gamma sonda, se resecó lesión sin eventualidades.

Palabras clave: paratiroidectomía, hiperparatiroidismo, paratiroides ectópica, paratiroides mediastinal.

INTRODUCTION
Primary hyperparathyroidism (PHPT) is due to an increased secretion of parathyroid hormone (PTH). It is the most common cause of hypercalcemia, above all, during postmenopause. It was described for the first time back in 1930 [1].

Both its rate and prevalence have increased over the past decades thanks to the greater detection of mild hypercalcemia with the use of more biochemical tests with serum calcium that has increased the number of diagnoses of asymptomatic cases of PHPT. Its significance lies in its progression: up to a fourth of all patients ends up developing symptoms within the next 5 years [1,2].

A total of 80% of all PHPTs are benign parathyroid adenomas, 15% to 20% are parathyroid hyperplasias, and less than 1% parathyroid carcinomas [1].

Ectopic parathyroid glands (EPG), described in up to 16% of the cases, are due to the anomalous migration of these during development. They can be found in tissues that share their embryologic origin [3]. Imaging modalities are important for the diagnosis, location, and surgical planning of this entity. Parathyroidectomy (PT) is the ultimate treatment here [3,4].

This is the case report of a female patient with PHPT due to ectopic parathyroid adenoma.

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Date of reception: 28/06/2022 - Date of approval: 19/09/2022
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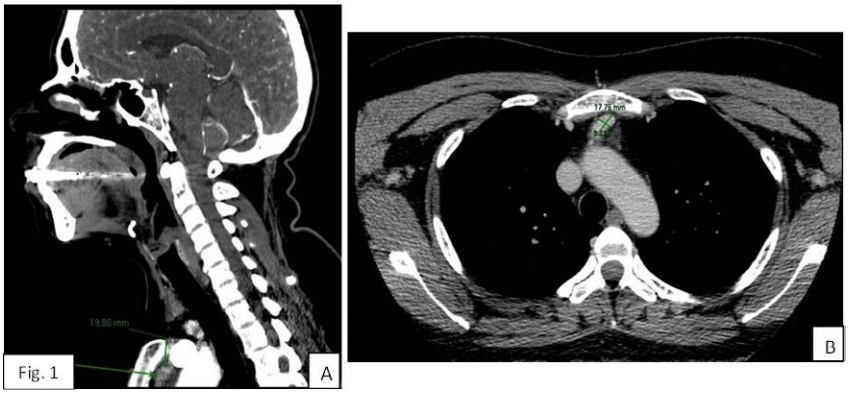

Figure 1. Computed tomography scan. Panel A: Sagittal view showing ectopic parathyroid adenoma 2 cm away from the sternal notch. Panel B: Axial view showing an oval-shaped nodular image with demarcated borders.

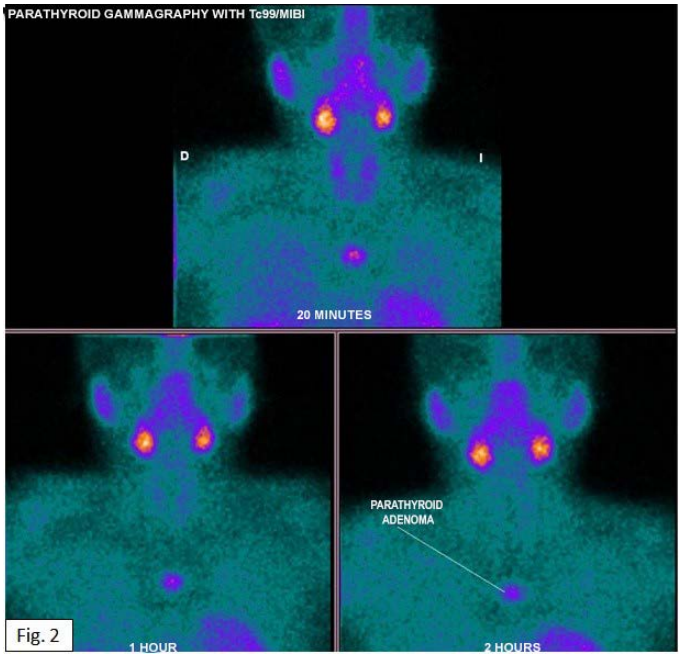

Figure 2. Images acquired through parathyroid gammagraphy with 99mTc-Sestamib showing the ectopic parathyroid adenoma at the superior mediastinum central region.

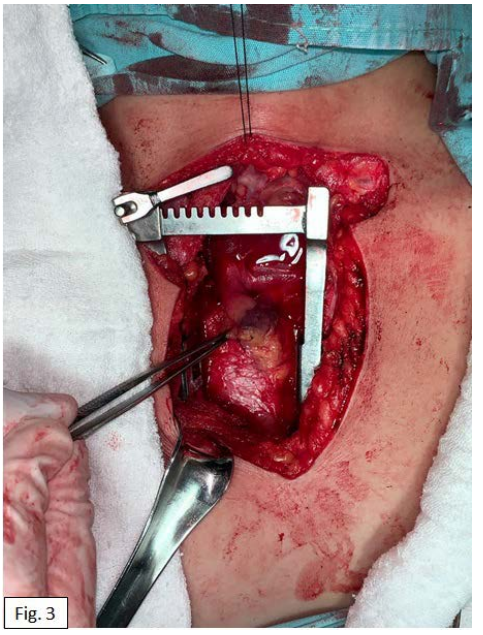

Figure 3. Transoperative image of ectopic parathyroid adenoma at superior mediastinal level.

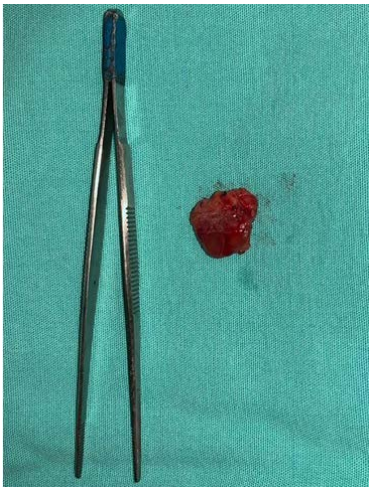

Figure 4. Resection of ectopic parathyroid adenoma measuring 2 cm x 1.6 cm x 0.8 cm and weighting 1.7 g.

CLINICAL SIGNS

This is the case of a 39-year-old woman with multiple episodes of urinary tract infections, renal colics, and nephrolithiasis. She presents with weakness, chronic fatigue, and hypercalcemia (10.9 mg/dL). PTH is analyzed and since elevated levels are found (138.3 pg/mL) PHPT is finally diagnosed.

Management of the patient included a computed tomography scan (see Figure 1) and a gammagraphy with Tc99-sestamibi (Figure 2) that revealed the presence of ectopic parathyroid adenoma of superior mediastinum location. Transverse cervicotomy access was used and medium sternotomy with pneumatic saw was performed under balanced general anesthesia. The radio-and-gamma probe guided minimally invasive parathyroidectomy performed revealed the presence of parathyroid adenoma at mediastinum level (Figure 3) that was resected uneventfully (Figure 4). No events were reported during the postoperative period resulting in lower levels of calcium and PTH.

DISCUSSION

PHPT is more common in women on a 4:1 ratio compared to men. The highest incidence rate has been reported within the first few years after menopause, which is consistent with estrogen loss. Up to 20% of the patients have a past medical history of renal colics [1]. Our case is consistent with the cases reported in the medical literature available today.

There are 3 different presentations of PHPT: symptomatic or classic (elevated calcium and PTH levels), asymptomatic or normohormonal (elevated calcium and normal PTH levels) and normocalcemic (normal calcium and elevated PTH levels). The latter can be a precursor of traditional PHPT [1, 2]. Our patient had classic signs.

The risk factors reported are low calcium intake, low physical activity, large abdominal circumference, obesity, hypertension, neck radiation or nuclear exposure and prolonged lithium therapy [1].

Up to 16% of the patients show EPG. Three different studies concluded that the most common regions are the thymus, the retro/paraesophageal space, and thyroid, which represent 56% to 89% combined. Between 6% and 26% have been described in the mediastinum [5,6].

Signs and symptoms are due to hypercalcemia, among them, fatigue, weakness, polyuria, polydipsia, constipation, anorexia, vomiting, dehydration, arrhythmias, anxiety, altered mental state, and mood swings. Our patient also complained of fatigue, and chronic weakness [1]. Frailty-induced fractures, skeletal deformities, and bone pain are also possible. Also, presentation through hypercalciuria, nephrolithiasis, nephrocalcinosis, and reduced renal function [1], as it happened in our case and its presentation of classical phenotype.

Diagnosis is achieved after detecting elevated hypercalcemia. Also, elevated PTH levels with ≥ 20 pg/mL in the context of hypercalcemia is consistent with the diagnosis [1,7].

Preoperative imaging modalities facilitate surgery by accurately finding the adenoma like ultrasound, gammagraphy with 99m-tecnecium-sestamibi, computed tomography scan, magnetic resonance imaging, and PET [8]. Gammagraphy has higher sensitivity (89%) and ultrasound has less sensitivity (59% to 76%) although the latter is more widely available. Gammagraphy is considered the gold standard [3,8].

Surgery is clearly indicated in patients with symptoms due to hypercalcemia or target organ failure (frailty-induced fractures or colics) [1,7]. Definitive treatment of choice is parathyroidectomy [8]. Cervical approach is often enough. However, 2% of the cases of mediastinal location require transsternal or transthoracic approach [3].

The rates of healing for an experienced surgeon exceed 95% with a very low rate of complications (< 1% to 3 %) like hemorrhages, hypocalcemia, and recurring laryngeal never injuries [1,2]. Once parathyroidectomy has been performed, biochemical markers often go back to normal, and bone density goes up, thus reducing the risk of fracture and nephrolithiasis [8].

Authors' contributions: MAJR and JAGG were involved in surgical treatment, bibliographic search, and drafting of the manuscript. MATL and LJBF were involved in surgical treatment, counselling while drafting the manuscript, and proofreading tasks. GEMM was involved in the process of drafting and proofreading the manuscript. The authors declared no conflicts of interest whatsoever.

Conflicts of interest: none reported.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Case report Doi: 10.18004/sopaci.2022.diciembre.34

Stomach volvulus. About a case

Vólvulo gástrico. A propósito de un caso clínico

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ABSTRACT
Gastric volvulus, a rare and urgent entity. Defined as gastric rotation on its axis more than 180 degrees, determining stenosis to the passage of gastric content, distension, leading to parietal irrigation compromise. The delay in diagnosis and/or treatment leads to strangulation or gastric perforation. We present a 90-year-old patient with a gastric volvulus, his diagnostic and therapeutic approach with laparoscopic gastropexy with good results.
Key Words: Stomach volvus, gastric outlet obstruction, laparoscopic gastropexy.

RESUMEN
El vólvulo gástrico es una entidad rara y urgente. Definido como la rotación gástrica sobre su eje más de 180 grados, determina una estenosis al pasaje del contenido gástrico, distensión y derivando en el compromiso de la irrigación parietal. El atraso en su diagnóstico y/o tratamiento deriva en estrangulación o perforación gástrica. Presentamos un paciente de 90 años con un vólvulo gástrico, su abordaje diagnóstico y terapéutico con gastropexia laparoscópica con buenos resultados.
Palabras Claves: Vólvulo gástrico; obstrucción de la salida gástrica; gastropexia laparoscópica.

INTRODUCTION

Stomach volvulus is defined as an abnormal rotation of the stomach on its axis that leads to luminal obstruction whether transient due to spontaneous devolvulation or it can compromise the parietal vasculature leading to stomach ischemia. In the latter case, morbidity and mortality rates reach 80% triggering emergency surgeries.1 Its highest incidence rate has been reported during the 5th decade of life though other authors describe higher incidence rates in children. There is no prevalence based on race or sex.

This case shows our own experience at our center on a case report of gastric volvulus with laparoscopic surgical resolution with good clinical outcomes.

CASE REPORT

This is the case of a 90-year-old woman without follow-up examinations or a significant past surgical history who presented to the ER with clinical signs of cyclic vomiting syndrome of the entire stomach content of 72-hour evolution. Vomiting appeared greenish in color. These signs were accompanied by a 24-hour material transit retention in the patient's stomach.

The patient's physical examination revealed a substandard physical condition, dehydration, painful expressions at palpation, and no fever. Hemodynamics was normal with presence of soft, depressible, and distended abdomen that was painful to diffuse superficial palpation. No elements of peritoneal irritation were seen. A nasogastric tube was inserted with presence of abundant green color content. Approximately 1000 cc were drained. The x-ray image of the dorsal abdomen acquired in the decubitus and standing positions reveals the presence of a major gastric distension with rotation of the stomach on its axis ***(figure 1)***.

The abdominal and pelvic computed tomography scan with IV contrast performed revealed the presence of gastric malrotation with pyloric antrum elevation of gastric volvulus appearance confirming the obstruction ***(figure 2).*** Also, the stomach appears with significant retention of content and mural cystic neurofibromatosis. No pneumoperitoneum is confirmed, but presence of adjacent fluid. Presence of elevated left hemidiaphragm with a small amount of left pleural effusion.

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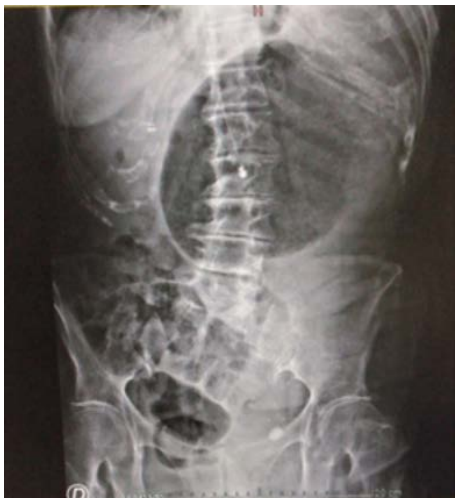

Figure 1. Abdominal x-ray in the dorsal decubitus position showing an image consistent with gastric volvulus, large gastric distention, and nasogastric tube inside. Displaced transverse colon underneath.

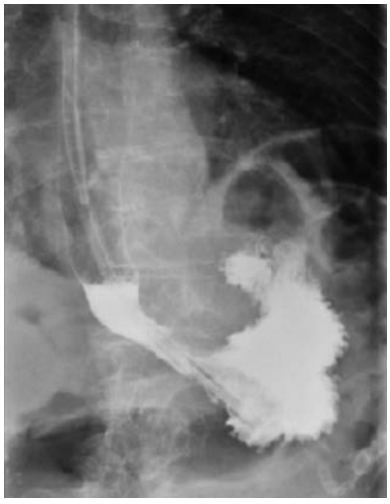

Figure 3. Esophagogastroduodenal x-ray with oral hydrosoluble contrast reveals the presence of stopped content at gastric body level without passage of contrast towards the duodenum.

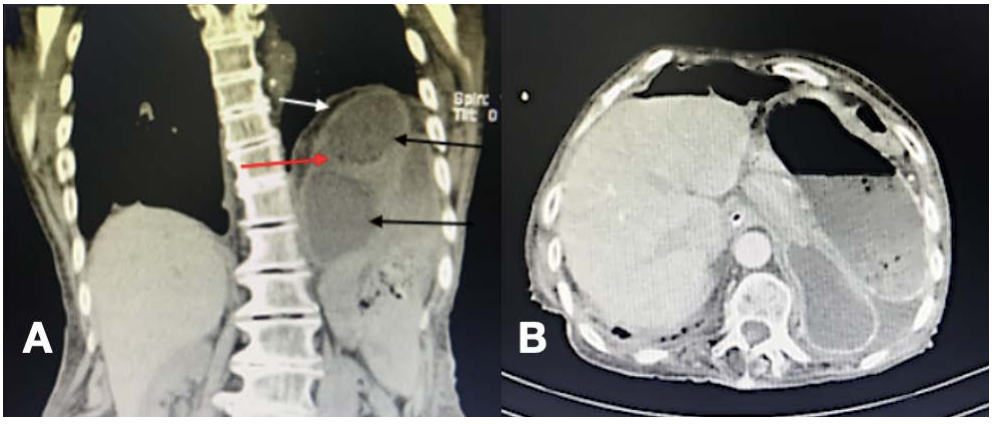

Figure 2. Computed tomography scan. Panel A: coronal view showing gastric malrotation with antrum-pylorus elevation causing the obstruction and looking like gastric volvulus. Also, presence of mild left pleural effusion. Black arrows: stomach with significant fluid content; red arrow: mural cystic neurofibromatosis; white arrow: left hemidiaphragm elevation. Panel B: axial view. Small amount of fluid adjacent to the stomach. No pneumoperitoneum.

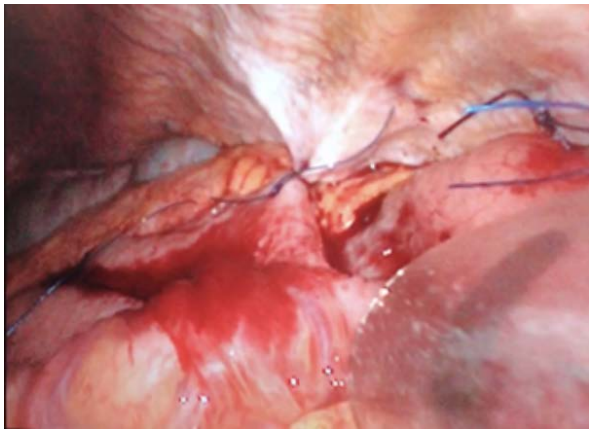

Figure 4. Laparoscopic gastropexy. Presence of two polypropylene meshes fixated from the gastric greater curvature towards the parietal peritoneum.

The patient's progression was good and abdominal pain receded after placing the nasogastric tube with scarce vomiting. The esophagogastroduodenal x-ray acquired with oral hydrosoluble contrast revealed the presence of stopped material at gastric body level without passage of contrast towards the duodenum ***(figure 3)***.

Therefore, an exploratory emergency laparoscopy was performed that confirmed spontaneous devolvulation and gastric body distention without elements of parietal ischemia or associated hiatal defect. Gastropexy of the greater curvature was performed towards parietal peritoneum with 2 polypropylene meshes without complications ***(figure 4)***.

Good postoperative progression. The nasogastric tube was removed after 24 hours. Afterwards, the patient was fed orally without abdominal pain, fever, preserved transits, and with a nice-looking surgical wound. This led to the patient's discharge from the hospital. The outpatient control of the patient 1 week later confirmed that she remained totally asymptomatic.

DISCUSSION

Stomach volvulus is a rare entity and an emergency condition. Delayed diagnosis and/or treatment can be associated with complication like gastric strangulation or perforation. It can be due to multiple causes determining obstruction to the passage of gastric content—distension —leading to parietal irrigation.

Idiopathic and secondary predisposing factors have been reported. The former are elongations or lack of ligaments that fixate the stomach to the peritoneum, abnormally distended stomach, hernias or diaphragmatic eventrations, erratic spleen or malrotation with asplenia. The latter are reductive gastric surgeries (Nissen's technique), ruptured gastric ligaments due to liver transplant, trauma, and gastric neoplasms. [2]

We should mention that although the patient had no past surgical history, she did have an abnormally distended stomach. No hiatal hernia—frequently associated with such condition—was seen according to the medical literature available.

Borchardt's triad can guide the diagnosis of acute gastric volvulus. It is made up of clinical elements like pain and epigastric distension, nausea with violent vomiting or impossibility to vomit, and the impossibility of passing the nasogastric tube (mainly in children), present in 70% of the cases.[3]

According to Singleton, gastric volume is classified by its axis on which the stomach spins: organoaxial rotation, mesentericoaxial, and a combination of the two. In the former the stomach rotates on an axis that connects the gastroesophageal junction to the pylorus, the antrum rotates in opposite direction to the gastric fundus this being the most common of all (59%) and commonly associated with diaphragmatic defects.[4]

Regarding treatment, the current tendency is to use less invasive techniques (endoscopic, laparoscopic or both), which is highly beneficial in high-surgical anesthetic risk patients. Recommendation here is to correct the position of the stomach to later fixate it in its normal position and repair the diaphragmatic defect associated with it. A less commonly used alternative is gastropexy with gastrocolic ligament section (Tanner's technique), gastrectomy, gastrojejunal anastomosis, and fundus-antrum anastomosis (Opolzer's technique) among other.[5]

Regarding treatment, laparoscopy was decided, which had very good results and achieved a clear benefit solving the actual acute disease and sparing a more aggressive procedure that would have added more morbidity and mortality to the patient.

Authors' contributions: All the authors collaborated equally to the drafting this manuscript.

Conflicts of interest: none reported.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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Case report Doi: 10.18004/sopaci.2022.diciembre.37

Percutaneous treatment of psoas muscle abscess secondary to spondylodiscitis

Tratamiento percutáneo de absceso de músculo psoas ilíaco secundario a espondilodiscitis

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SUMMARY
The objective of the following work is to describe percutaneous treatment of an abscess located in the psoas muscle, a rare entity and nonspecific clinical presentation, which constitutes a diagnostic challenge. Its detection has improved with the use of imaging techniques. Fever, abdominal pain and ipsilateral lower limb pain are the usual manifestations. Antibiotic therapy together with drainage (percutaneous or surgical) should be considered the treatment of choice.

Keywords: Psoas abscess, spondylodiscitis, percutaneous drainage.

RESUMEN
El objetivo del siguiente trabajo es describir el tratamiento percutáneo de un absceso localizado en el músculo psoas**,** entidad poco frecuente y presentación clínica inespecífica lo que constituye un desafío diagnostico. Su detección ha mejorado con la utilización de técnicas de imagen. La fiebre, dolor abdominal y del miembro inferior ipsilateral son las manifestaciones habituales. La antibioticoterapia junto al drenaje (percutáneo o quirúrgico) debe considerarse el tratamiento de elección.

Palabras claves: Absceso de psoas ilíaco, espondilodiscitis, drenaje percutáneo.

INTRODUCTION

Psoas muscle abscess is a rare entity. A rate of 0.4% for every 100 000 inhabitants has been reported being more common in men compared to women[1]. On the clinical level, it presents as fever, back pain, and walking disorders[2]. This is the case of a 64-year-old patient with a psoas muscle abscess due to spondylodiscitis successfully treated with antibiotic therapy and percutaneous drainage.

CASE REPORT

This is the case of a 64-year-old man with diabetes mellitus type II and arterial hypertension. The patient showed a 12-day history of asthenia, adynamia, walking difficulties, abdominal and back pain of growing intensity, fever, and chills. The abdominal examination reveals pain to the right side without peritoneal irritation, pain to palpation over the right iliac fossa, and active and passive mobilization of the ipsilateral lower limb.

Hemogram results show leukocytosis of 19 400/mm3 with 90.3% neutrophils, hemoglobin, 11.1 g/dL, normal platelet counts, C-reactive protein levels of 173.38 mg/dL, and erythrocyte sedimentation rates of 132 mm/h. Abdominal ultrasound reveals the presence, at right paravertebral level, of a 14 cm x 4 cm long, well-demarcated, non-vascularized, hypoechoic image suggestive of fluid collection at such level. Given the ultrasound findings, an abdominal, pelvic, and thoracic computed tomography scan with IV contrast is performed. It reveals the presence of disc space narrowing in L2 and L3 vertebrae, and irregularities of vertebral discs, which are all findings consistent with spondylodiscitis ***(see figure 1)***, which is, in turn, associated with extensive fluid/abscess collection of the right psoas muscle measuring 155 mm x 45 mm x 45 mm ***(see figure 2)***.

Empirical antibiotic therapy with IV pieracillin/tazobactam 4gr/0.5gr every 6 hours is started. Tomography-guided percutaneous drainage is performed, and a 12-Fr drainage tube is uneventfully inserted with the trocar technique without complications. A total of 100 cc of purulent fluid are obtained. The sample was then sent to perform an antibiogram, cytolo-

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Date of reception: 01/09/2022 - Date of approval: 12/11/2022
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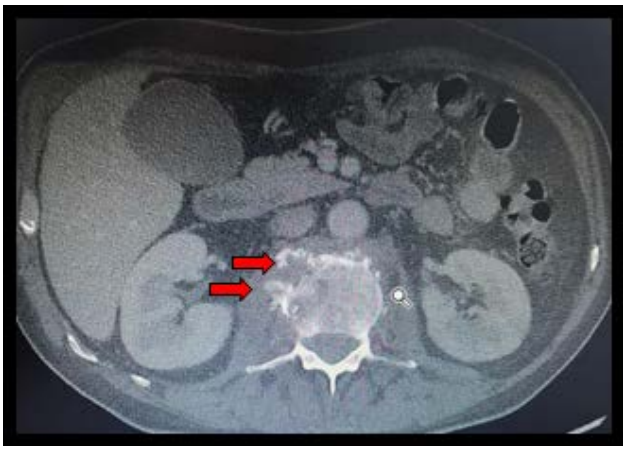

Figure 1. Axial computed tomography, bone window. Spondylodiscitis (red arrows).

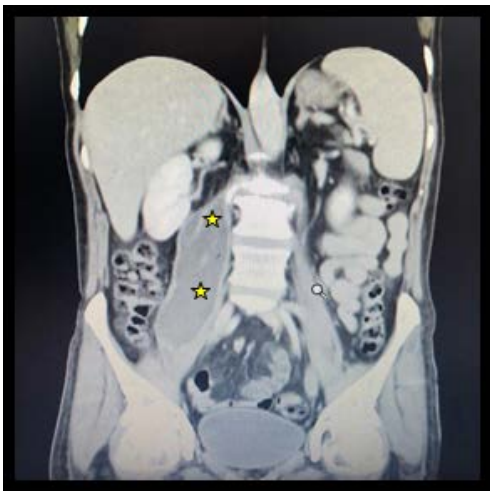

Figure 2. Abdominal and pelvic coronal computed tomography scan. Right iliac psoas muscle abscess (yellow arrows).

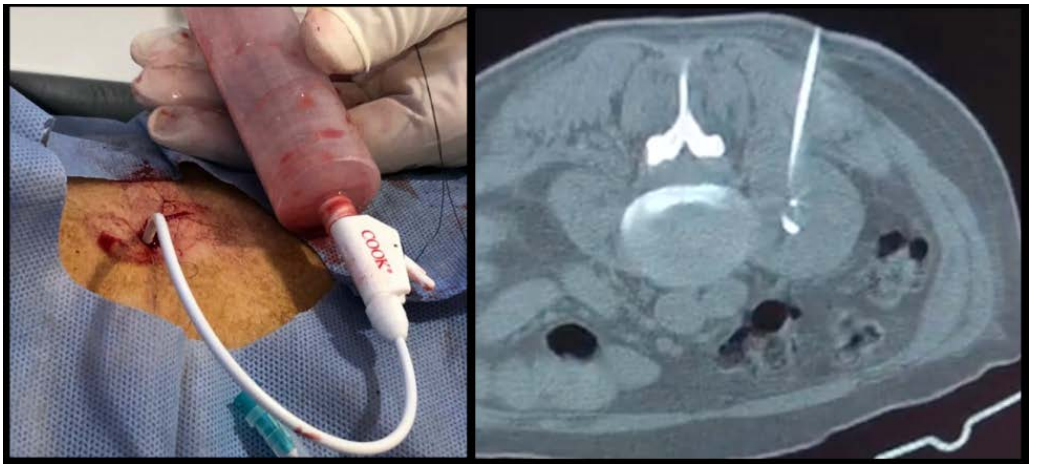

Figure 3: Computed tomography-guided percutaneous drainage.

gical examination, and adenosine deaminase diagnostic testing (ADA) (Figure 3).

The sample ends up growing *Staphylococcus aureus*. After discussion with the infectious disease unit, the patient is administered antibiotics: 2 gr of IV cefazoline every 8 hours plus 300 mg of oral rifampicin every 12 hours. The patient's disease progression is good with clinical improvement, and normal infectious parameters.

Drainage is removed after 12 days. IV antibiotic therapy is maintained for a month and extended for another 2 months orally to end up completing 3 months of antibiotic therapy. The trauma doctor indicates immobilization, and orthopedic stabilization with plaster corset followed by physical therapy with good progression.

Currently, after the completion of antibiotic treatment, the patient remains in outpatient control in the trauma center, infectious disease unit, and surgery unit. He remains asymptomatic and has had zero relapses.

DISCUSSION

Psoas muscle abscess was a known complication of tuberculous spinal column. Currently, it is the most common cause of pyogenic infection and can be primary (hematogenous dissemination) or secondary being the most common cause of spondylodiscitis[3].

The classic triad of clinical presentation of fever, back pain, and limp is seen only in 30% of the cases, which complicates its diagnosis even further[2]. At bacteriological level, the most common microorganism is *Staphylococcus Aureus* that represents up to 65% of the cases followed by *Escherichia coli* the latter being associated with urinary tract or GI infections, old age, immunosuppression, and diabetes[4]. Lab test results that support diagnosis include leukocytosis, elevated erythrocyte sedimentation rate and C-reactive protein as it was the case of our patient.[4]

Regarding imaging diagnosis, the ultrasound can be useful to assess intramuscular collections. However, utility is limited in deep retroperitoneal structures due to the patient's anatomy

(obesity for example), and gas interposition, and presents a 60% sensitivity only. Computed tomography scan and nuclear magnetic resonance imaging offer better diagnostic accuracy with similar sensitivity rates between 80% and 87%. Between both imaging modalities, computed tomography scan is especially useful given its good sensitivity, greater availability, and lower cost[5].

Regarding the therapeutic arsenal, there are 2 basic pillars here: targeted antibiotic therapy based on microbiological profiles and surgical or percutaneous drainage. Currently, the technique of choice is the latter due to the good results and lower rates of complications.[6,7]

Surgical drainage (used alone or in combination with percutaneous techniques) is spared for multiloculated abscesses with extensive compromise of structures, and abscesses due to some specific conditions, among them, inflammatory bowel disease, pyelonephritis, epidural abscesses with spinal compression, among other[8,9]. Imaging-guided percutaneous approach is a safe and less invasive alternative, which should be considered as the first-line therapy because it yields results similar to surgical drainage with less morbidity, and a shorter length of stay[10].

A**uthors' contributions:** All the authors collaborated equally to the drafting this manuscript.

Conflicts of interest: none reported.

Financing: the authors declare that they have not received any type of funding for the realization of this article.

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