

# Clinical and epidemiological characteristics and surgical treatment of patients 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:** twenty-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 métodos:** 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 varía 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% re-

cibió 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.<sup>(1-2)</sup>

*Echinococcus granulosus* causes echinococcosis, and *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%).<sup>(3)</sup>

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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tients have 1 single organ damaged with one single cyst too. <sup>(4)</sup>

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 importance 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. <sup>(5-6-7)</sup>

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. <sup>(8-9)</sup>

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 principles 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. <sup>(10)</sup>

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 parasitocidal 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 parasitocidal 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*, Itauguá, 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  $57.0 \pm 14.3$  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.

## 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%).<sup>(5)</sup>

The predominance of women affected is not consistent with the study conducted by Alises et al.<sup>(12)</sup> 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.<sup>(13)</sup>

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

**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

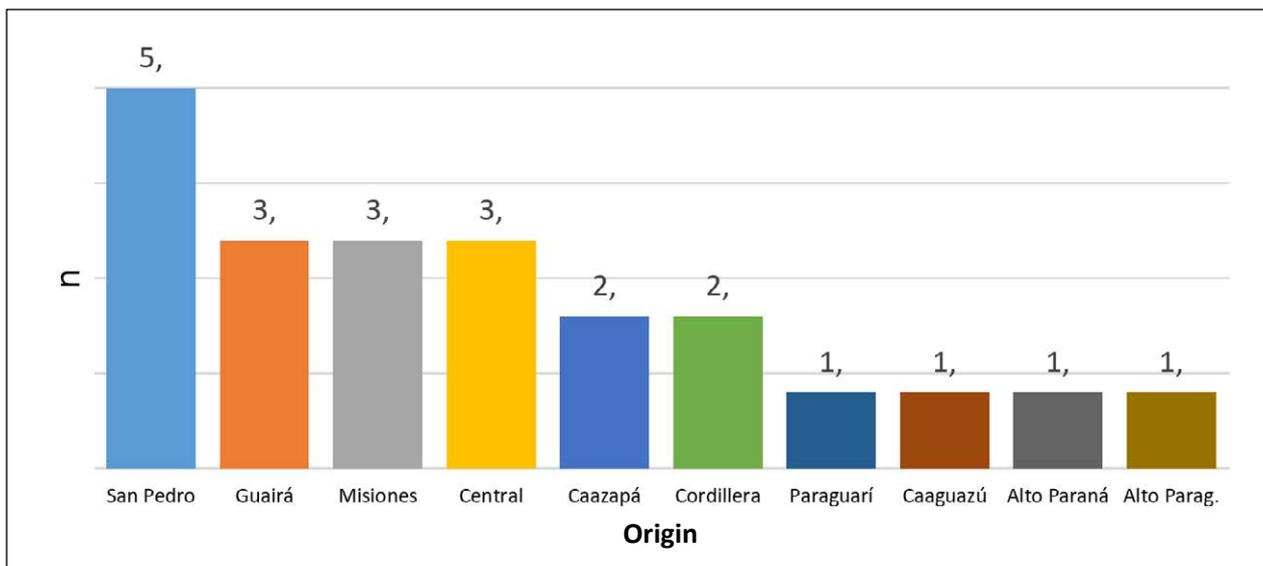
CT scan classification	%
CL	4.5%
CE1	50%
CE2	27.3%
CE3	9.1%
CE4	9.1%
CE5	0

most common symptom was pain as well (52.6%).<sup>(14)</sup>

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 *Echinococcus 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.

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