# Echographic Evaluation of Hepatic *Echinococcus*

**Healthcare**

**Keywords:** Echinococcus, geographic distribution of the echinococcal worms, Echinococcus granulosus cysts, ultrasound examination, etc.

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## Abstract

Background: Hydatid disease is a parasitic infestation by a tapeworm of the genus Echinococcus. It is not endemic in the United States, but the change of immigration patterns and the improvement of transcontinental transportation over the past 4 decades have caused a rise in the profile of this previously unusual disease throughout North America. This has led to the necessity for physicians to be more aware of its clinical features, diagnosis, and management. Pathophysiology: Human echinococcosis is a zoonotic infection caused by the tapeworm of the genus Echinococcus. Of the 4 known species of Echinococcus, 3 are of medical importance in humans. These are Echinococcusgranulosus, causing cystic echinococcosis (CE); Echinococcusmultilocularis, causing alveolar echinococcosis (AE); and Echinococcusvogeli. E granulosus is the most common of the three. E multilocularis is rare but is the most virulent, and E vogeli is the most rare. Frequency: In the US: Despite the rise in occurrence, echinococcosis remains a very rare disease (<1 case per 1 million inhabitants) in the continental United States. Northern Alaska has endemic areas of E granulosus, but the frequency of infection remains low (<1 case per 100,000 inhabitants).

### Introduction

Echinococcosis, also called hydatid disease, hydatidosis, or echinococcal disease, is a parasitic disease of tapeworms of the Echinococcus type.[19] Echinococcosis is unusual in northern Europe. The endemic areas are the Mediterranean countries, the Middle East, the southern part of South America, Iceland, Australia, New Zealand, and southern parts of Africa; the latter 5 are intensive endemic areas. The incidence of CE in endemic areas ranges from 1-220 cases per 100,000 inhabitants, while the incidence of AE ranges from 0.03-1.2 cases per 100,000 inhabitants, making it a much more rare form of echinococcosis. Infestation with E vogeli is the most rare form of echinococcosis and is reported mainly in the southern parts of South America.

### Mortality/Morbidity

Morbidity is usually secondary to free rupture of the echinococcal cyst (with or without anaphylaxis), infection of the cyst, or dysfunction of affected organs. Examples of dysfunction of affected organs are biliary obstruction, cirrhosis, bronchial obstruction, renal outflow obstruction, increased intracranial pressure secondary to mass, and hydrocephalus secondary to cerebrospinal fluid outflow obstruction.

In CE, mortality is secondary to anaphylaxis, systemic complications of the cysts (eg, sepsis, cirrhosis, respiratory failure), or operative complications.

In clinical cases of AE, the mortality rate is 50-60%. This figure reaches 100% for untreated or poorly treated AE. Sudden death has been reported with AE in asymptomatic patients (autopsy diagnosis).

[19] Source: http://en.wikipedia.org/wiki/Echinococcosis

**Race**

Because of the restricted geographic distribution of the echinococcal worms, persons of certain races are affected more commonly than others; however, the parasite has the capability of infecting persons of all races equally.

**Sex**

No sexual predilection is recognized.

**Age**

The cysts grow slowly, and a cyst is rarely diagnosed during childhood or adolescence unless the brain is affected.

CE is a disease of younger adults, with an average age at diagnosis of 30-40 years.
AE is a disease of older adults, with an average age at diagnosis of older than 50 years.

In this paper are evaluated clinicopathological data of 126 ultrasound-treated patients from the Hospital Center Mother Teresa during the time frame 1990-2003.

***From the assessment of our data it is shown that the age group most affected ekinokoku us of heparin are: Nr1 graph***

**Janary 1990 – December 2003**

From 126 treated patients 52 or 41.26% were males and 74 or 58.74% were females

Avarage age 44,09 age limit 10 – 75 vjeç

The average age was 44.09 years age limit from 10 to 75 years

Males average age

42,4 age (17 - 67 age)

Females average age

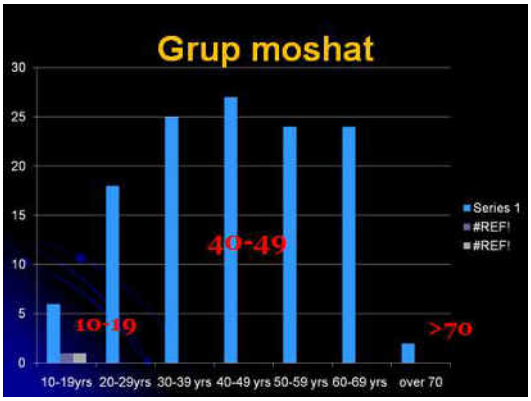
46,6 age (10 - 75 age)

Statistical analysis by Fisher - Student results in t = 1.43 significance unit

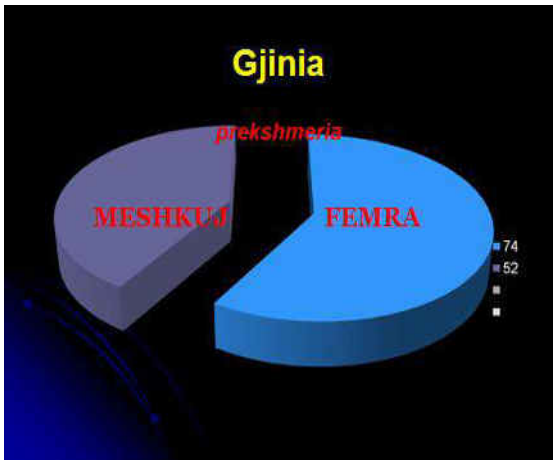
10-19 age group 6 cases 20-29 age group 18 cases 30-39 age group 25 cases 40-49 age group 27 cases

50-59 age group 24 cases 60-69 age group 24 cases over 70 age group 2 cases

Est 4.76 14.28 19.84 21.52 19.04 19.04 1.58




*Graph nr1*




*Graph Nr 2*

*In relation to sex, it turns out that women are affected more often than men*

Our data also coincide with the data of foreign authors.

*From the evaluation of our data it results that the most affected organ by Echinococcus, are the following:*

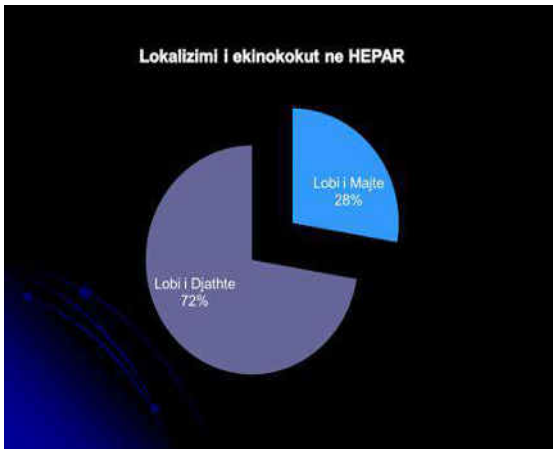
*Hepar 115 cases Lien 7 cases Ren 1 case Surren 1 case Pelvis/paret 1 case Ovar 1 case*

*Hepar 115 cases or 91,27% of patients, see graph Nr 3*

Lobi Dexter 81 cases

Lobi Sinister 31 cases

Bifokal 3 cases




*Graph Nr 3*

*Hepar 115 cases or 91,27% of patients*

Echinococcus affects mostly the liver (hepatos) having as a preference the right lobe, providing various clinical symptoms such as pain upper right quadrant of the abdomen, hepatomegaly, fevers and eikter.

***Pathologyand variations (complications)***

**Localization in Hepatitis**

| | |
|---|---|
| Biliary Fistula | 4 patients |
| Enterocutaneous Fistula | 1 patient |
| Free Abdominal cyst | 1 patient |
| Periapendicular infiltration | 2 patients |
| Dexter-hemithorax cyst | 1 patient |

**Localization in Lien**

| | |
|---|---|
| Peritoneal dissemination | 1 patient |

**Echinococcus granulosus**

This infection is endemic in the Mediterranean region. Echinococcus granulosus occurs with the formation of large cysts with characteristic building structure with three membranes:

• Germinal membrane (embryonic)

• Endocystic or hyaline membrane

• Ecto cystic membrane which has an increased vascularization and granular tissue.

Echinococcus granulosus cysts can be unique or multiple.

Daughter cysts (secondary) are small cysts that develop from a mother cyst (primary) or can climb with mother cyst through elongation with Germinal layer. Loops or polycystic calcification are the result of calcification of custic walls and in rare cases meet with calcium deposit inside hardened Cystic content.

Daughter cysts (secondary) have round or oval shape and inside are divided by thick septum. Each daughter cyst is surrounded by its external wall. The cyst is surrounded by a thick wall with clear boundaries from parenkima liver. The absence of calcification in the wall of Echinococcus makes it difficult the differential diagnosis with ther cysts. Hydatid cyst in the peritoneal cavity gives a dramatic picture, ultrasound examination of the entire abdomen seems fraught with Cystic formations with round shape. The differential diagnosis of this picture becomes with peritonitis mixomatosis and with mass abdominal necrosis of retroperitoneal sarcoma. Në imazhin ekografik E.granuloz paraqitet me formacion eristike të larmishme, si kisteunikameral, multikameral, me kista bijë në brendësi ose me kista bijë të ngjitura me membranën embrionle. In the ultrasound image Echinococcus granulosus appears with diverse eristike shapes, such as: Unicameral (simple) cysts, multicameral, with daughter cyst inside or attached to the embryonic membrane.

On ultrasound examination the differential diagnosis with simple cystitis is more difficult, help in the diagnose serological tests. Fig. 1

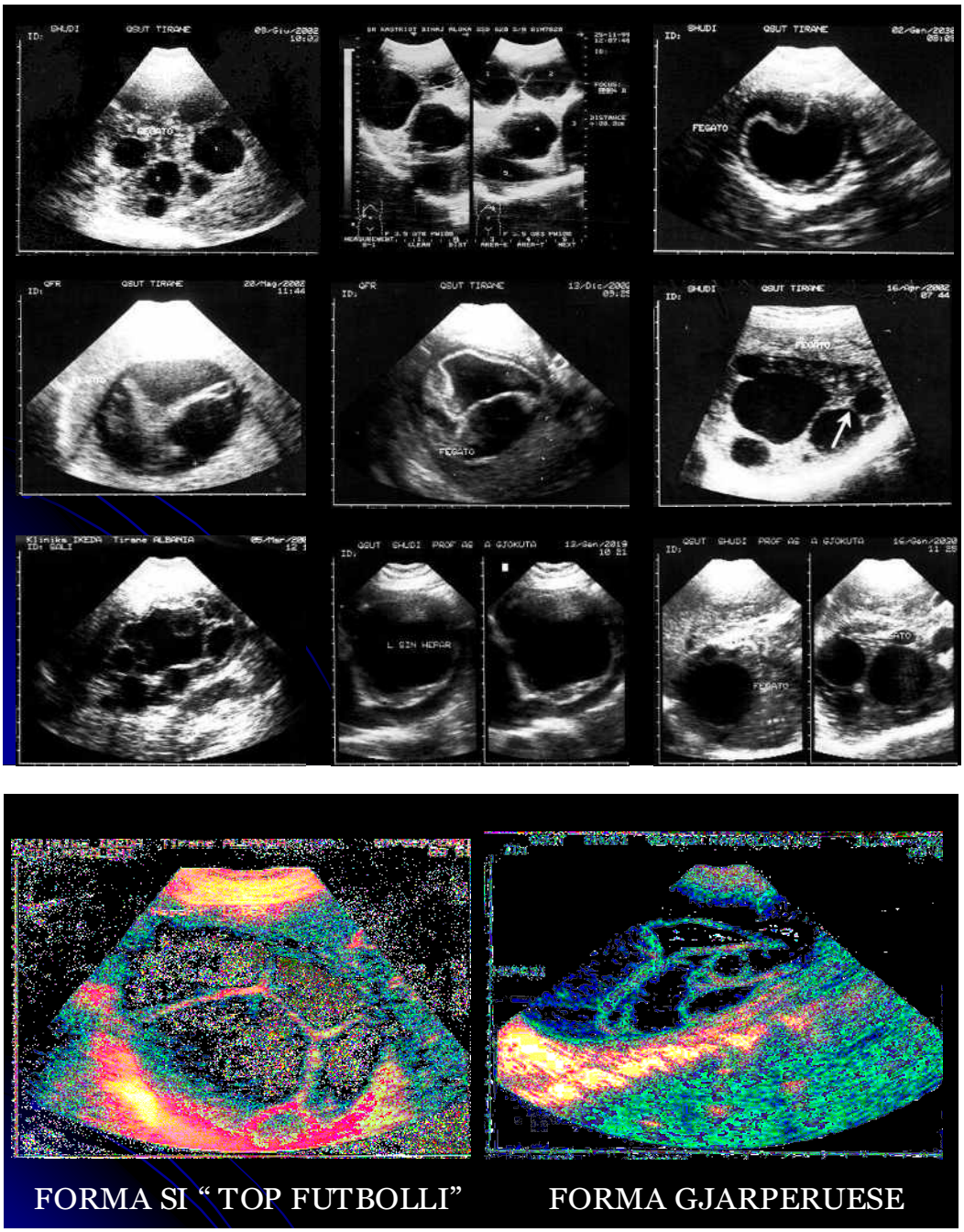



Fig 1.Ultrasound images of *Echinococcus granulosus*

We think that it is of great theoretical and practical interest the publication of two extremely rare cases that we have encountered in our medical practice. *Echinococcus* of the liver and ovarial in the same patient is a very rare pathology and in medical worldwide literature are published only four cases.

*The first case* in the ultrasound examination is recorded *Echinococcus* of the liver and ovarial *Echinococcus* on the right.

The case is operated and the diagnosis confirmed by surgery Dr.M.Kaçi

*The second case* in the ultrasound examination is evidenced with *Echinococcus* of the liver and a heterogeneous formation with small cysts inside with ovarian localization on the left.

The case is operated and results in *Echinococcus* of the liver, whereas *Echinococcus* of the liver was free to move in the peritoneal cavity. Fig.2

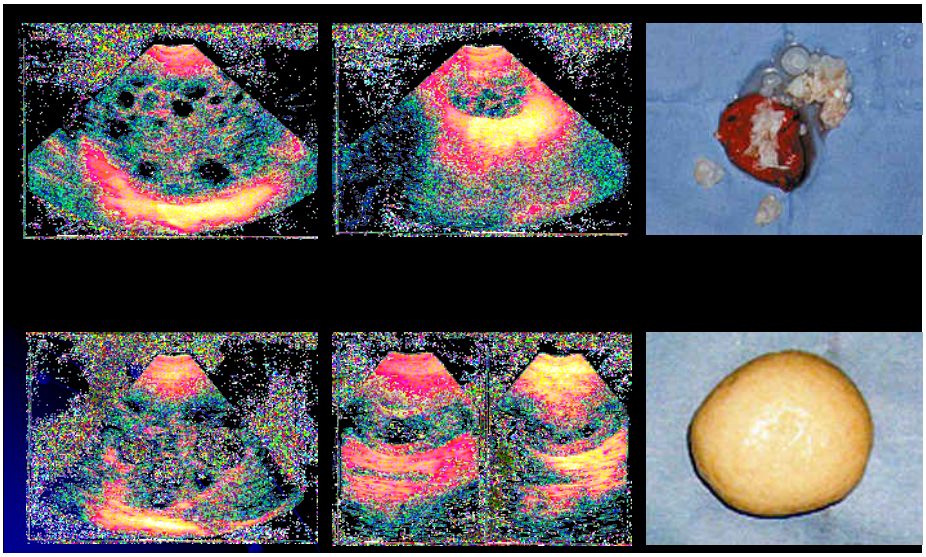


*Fig 2. Ultrasound imaging of Echinococcus of the liver and Ovarial Echinococcus*

In advanced stages of Cystic form *Echinococcus* is evidenced the presence of calcification inside the cyst as well as Cystic composure appears organized thus giving the imaging appearance in tumor-like formations. In such cases the ultrasound diagnosis is more difficult and CT examination is recommended figure. 3

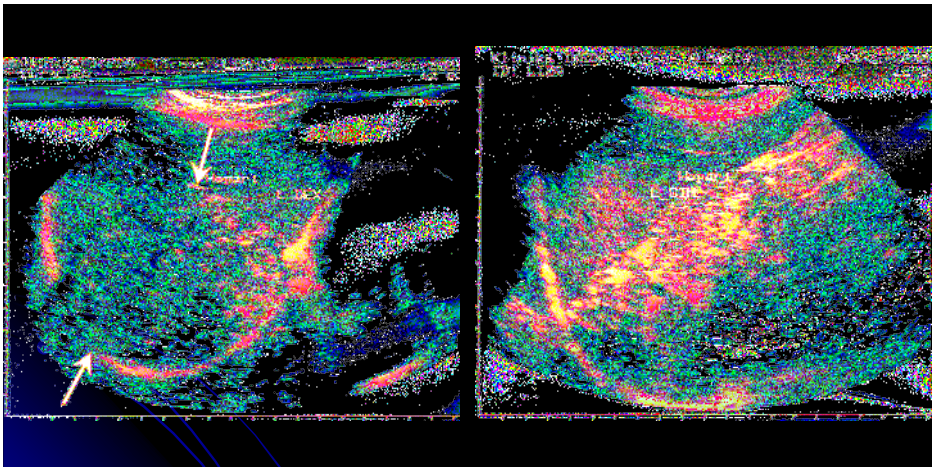


*Fig.3. Ultrasound images of Echinococcus in advanced stages where calcification is recorded inside the cyst turned in hyperechogen formation as a result of the organization of Cystic content.*

*Alveolar echinococcosis*

Infection from *Alveolar echinococcosis* is endemic in Central and Southern Europe.

From this infection children are more affected and there are preferences for the right lobe of liver. Hepatitis tissue affected is undergoing necrosis with watery consistency. The tissue has often a yellow kolor due to xanthomatous perifocal inflammation. When calcification and necrosis are absent, it is very difficult to distinguish this lesion from malignant tumors.

Tests are deterministic for serological diagnosis. Alveolar Echinococcus Echinococcus gives infiltrative lesions with no clear contours and they are extended to the abdominal wall of diaphragm or at the level of the portal vein. Fig. 4

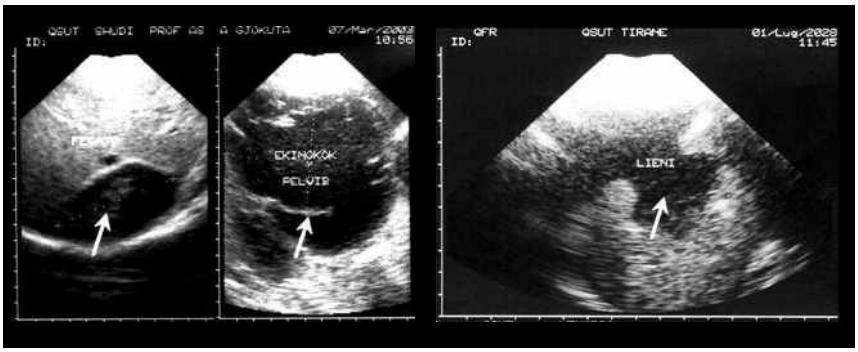



*Fig. 4* ***a)*** *Ultrasound images of Alveolar echinococcosis form with its localization in the liver and ovalium. Arrows. The case is operated and the diagnosis confirmed by surgery Dr.A. Gjata.* ***b)*** *On ultrasound examination it is evidence the hypoechogenic formation with anterior localization of Shtlien, posterior diaphragm with lung fistulization in the pulmon base (ultrasound array diagnosis), in the operation resulted Alveolar echinococcosis form with fistulization in pulmon. The case is operated and the diagnosis confirmed by surgery Dr.M.Kaçi*

**Conclusions**

In Albania there are two forms of *Echinococcus, such as Echinococcus granulosus and Alveolar echinococcosis*

Ultrasound classification is as follows:
1. *Echinococcus* with unique cysts
2. *Echinococcus* with multiple cysts
3. *Echinococcus* with daughter cysts
4. *Echinococcus* with forms of the ball
5. *Echinococcus* with twisting forms

The diagnosis is entirely with *Echinococcus* imaging and confirmed by serological tests. Ultrasound examination plays an important role in assessing the *Echinococcus.*

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