

## A Calcified Hydatid Cyst Transmitted from the Brain to the Liver

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Received: 04 August 2022; Accepted: 16 August 2022

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### ABSTRACT

This is a case report of an 80-year-old female patient who came to the emergency room complaining of severe headache, vomiting, multiple neurological deficits, increased intracranial pressure, and breathing difficulties due to presence of two calcified cysts in the brain and in the liver. This case will show the relation between the cyst in the liver and the cyst in the brain. The patient own many goats and this report will explain and discuss this medical issue in details about it's relation with animals. The aim of this paper is to discuss this rare condition and provide image documentation of the findings.

**Keywords:** Hydatid Cyst, Computed Tomography, Space Occupying Lesion, Mass Effect, Neurohydatidosis

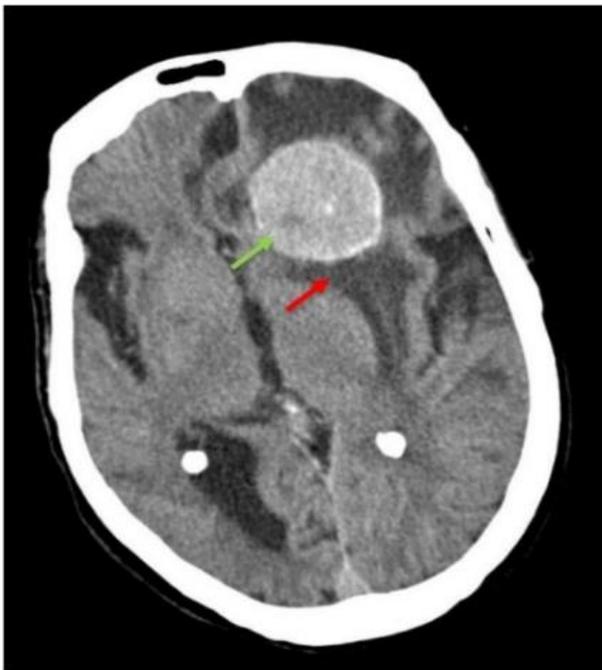
### Introduction

Hydatid cyst is an infection caused by *Echinococcus* tapeworm species which form a cyst in any part of the body. Cerebral hydatid cysts are very rare which has a prevalence of 1-2% of all cysts in endemic regions in one study, and it has prevalence of 0.2% of all intracranial occupying lesions in non-endemic region in another study respectively (Polat *et al.*, 2003; Tyagi *et al.*, 2010). Hydatid disease is an endemic in the Middle East, Africa, Mediterranean region, Australia, eastern part of Turkey, and parts of South America (Polat *et al.* 2003). Calcified hydatid cyst is even more rarer and it indicates a rare subtype known as alveolar echinococcosis (AE) which is more invasive and less common. This type (i.e. AE) main hosts are foxes. Usually the eggs of echinococcosis is ingested, then it forms a hydatid cyst. The hydatid cysts are common in the lung or the liver (Tyagi *et al.*, 2010). The cyst can increase in size from 5 to 10 cm and survive for decades (Tyagi *et al.*, 2010). The aim of this paper is to discuss this rare condition and provide image documentation of the findings.

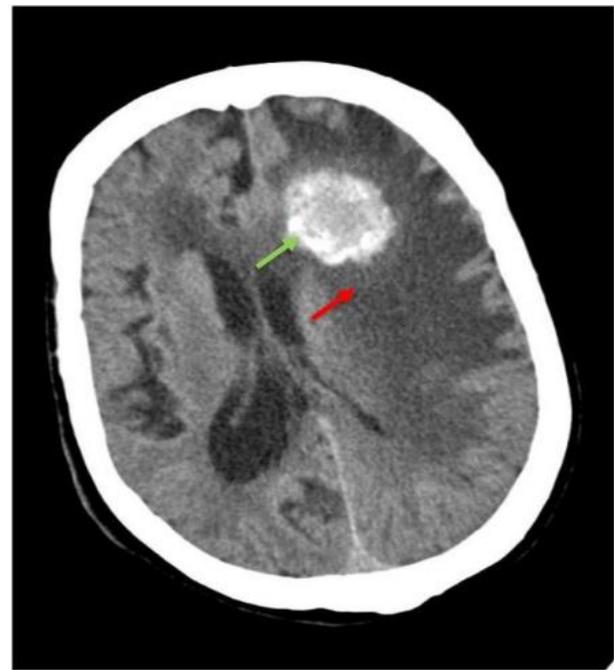
### Case Report

This is a case of an 80-year-old female patient who came to the emergency room (ER) with severe headache, vomiting, multiple neurological deficits, and increased intracranial pressure. A CT scan of the

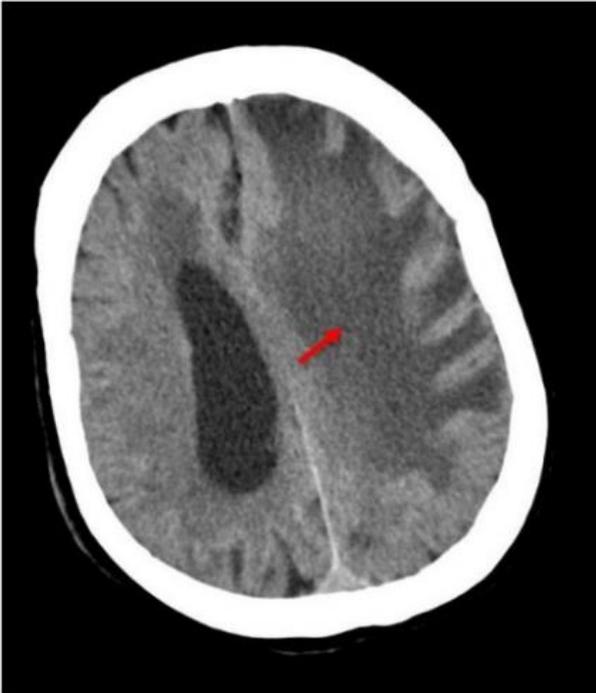
brain and the chest was done, (Fig. 1-9). The scan protocol in our department makes it clear that the coverage area in chest CT is from the shoulder and lower neck to the tip of the liver. The chest CT revealed a calcified hydatid cyst in the liver. As well, the brain CT revealed a calcified hydatid cyst in the brain. The chest is clear, and no pathology was detected. The patient did an abdomen X-ray before 7 years, which shows a calcified lesion near the pylorus of stomach and the left lobe of the liver. No record of any scan of the brain was available on the PAC system. The calcified cyst in the brain is causing a big mass effect and large edema surrounding the cyst that extend to the cortex of the parietal lobe. The entire left hemisphere is affected by this cyst. The dimensions of the cerebral cyst are 39.98 mm × 37.72 mm. The dimensions of the hepatic cyst are 82.40 mm × 64.28 mm. The cyst in the liver is bigger than the cyst in the brain and the patient underwent an abdomen X-ray 7 years ago and the calcified cyst exist which means the patient had complains about discomfort in the abdominal region see (Fig. 10). Logic dictate that the brain cyst came from the cyst in the abdomen. The patient refused to do the MRI scan for the brain and left the hospital.



**Figure 1:** An axial CT of the brain shows a hyperdense space occupying lesion (SOL) see (green arrow). It has a non-well uniform edge, represents a calcified cyst that appears to have a heterogeneous texture. The cyst occupies the left frontal lobe and the basal ganglia. The calcified cyst is surrounded by edema see (red arrow). The cyst is causing a mass effect on the entire left hemisphere of the brain. The HU for this calcified cyst is 79.



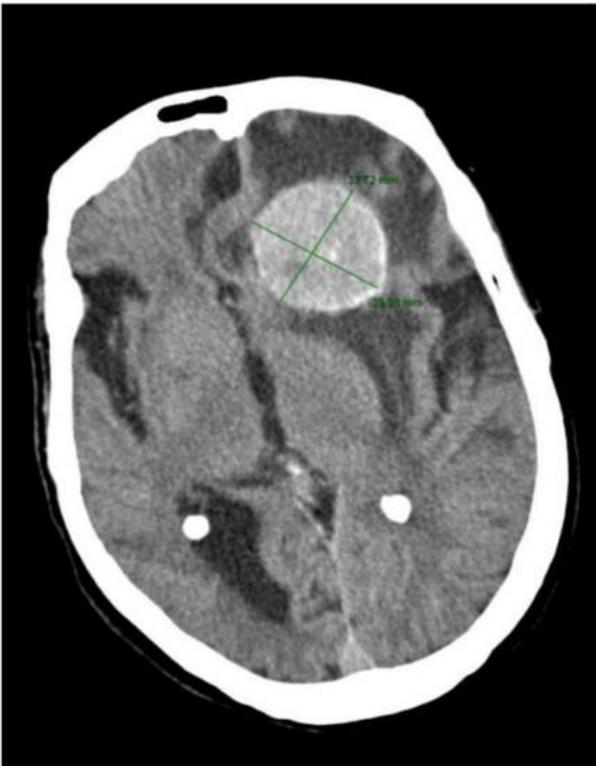
**Figure 2:** An axial CT of the brain shows a hyperdense space occupying lesion (SOL) see (green arrow). It has a non-well uniform edge, represents a calcified cyst that appears to have a heterogeneous texture. The cyst occupies the left frontal lobe and the basal ganglia. The calcified cyst is surrounded by edema see (red arrow). The cyst is causing a mass effect on the entire left hemisphere of the brain. The edema is extended to a large portion of the left hemisphere.



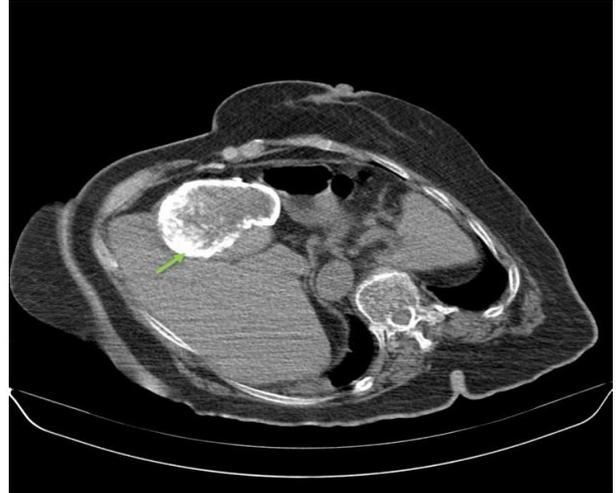
**Figure 3:** An axial CT scan of the brain shows the edema of the hydatid cyst reached the partial lobe superiorly see (red arrow).



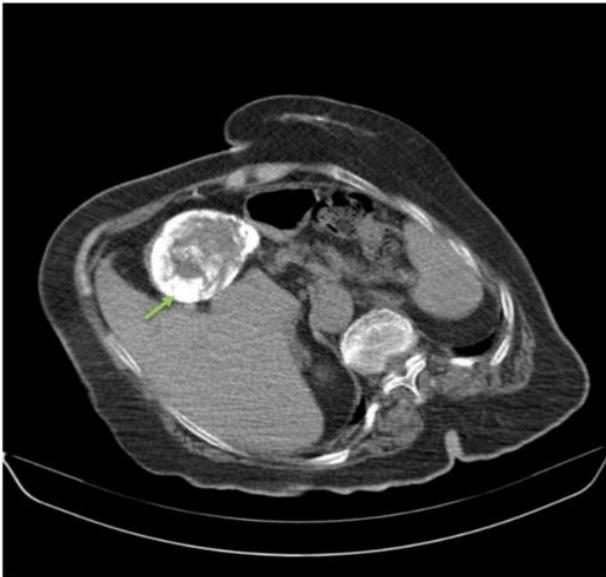
**Figure 4:** An axial CT scan of the brain shows the edema of the hydatid cyst reached the partial lobe superiorly see (red arrow).



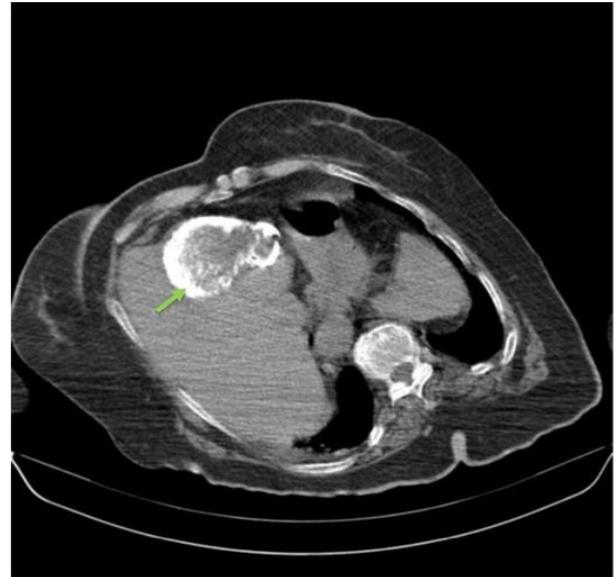
**Figure 5:** An axial CT scan of the brain with measurements take on it. The cyst measurements are 39.98 mm × 37.72 mm. The density of the cyst is measured 79 HU.



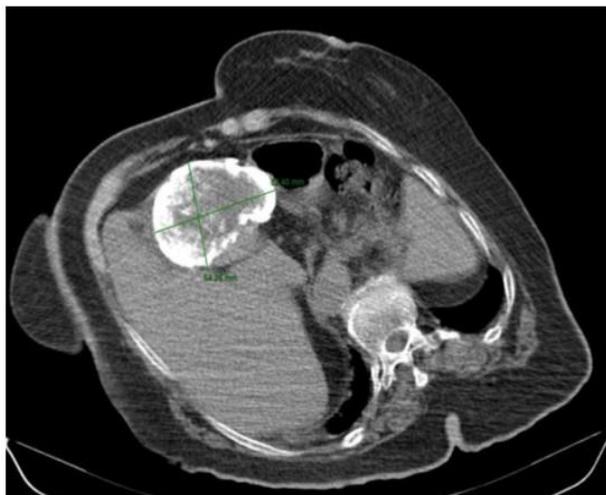
**Figure 6:** A plain axial CT scan of the abdomen (which is a part of the chest protocol coverage), the CT shows a hepatic calcified hydatid cyst see (green arrow). The cyst has a heterogenous texture, irregular edges, and more calcified on the periphery (i.e. calcified wall). The radiographer who made the patient position, did not centralize the patient in the right way and maybe because the patient is uncooperative due to multiple neurological deficits and inability of the male radiographer to touch the female patient for religious reasons. As well, the curved table caused the malpositioning of the patient. As well, this is a chest CT and the protocol makes it clear that the coverage area of the chest CT is from the shoulder and lower neck to the tip of liver (Alahmari, 2021).



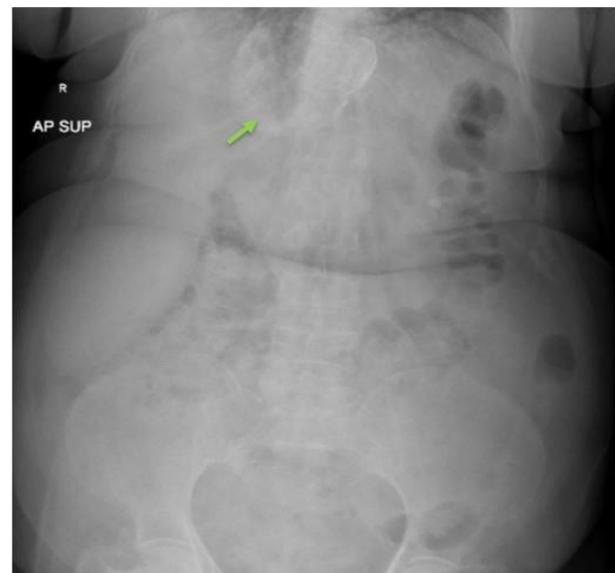
**Figure 7:** An axial CT of the abdomen shows a calcified hydatid cyst in the left lobe of the liver see (green arrow). The cyst is near the stomach and it could press the pylorus when the stomach is full and it could cause discomfort.



**Figure 8:** An axial CT scan shows hydatid cyst with irregular wall and heterogonous texture of the cyst see (green arrow).



**Figure 9:** The measurements of the cyst which measures 82.40 mm × 64.28 mm. The HU for this cyst is 296.42.



**Figure 10:** The abdomen X-ray that was taken before 7 years shows a calcified structure in the epigastric region see (green arrow).

## Discussion

The frequency of calcified cerebral hydatid cyst is less than 1% from all cerebral hydatid cysts (Alvarez *et al.*, 1982). The first linear calcified hydatid cyst case was reported in 1940, while the round calcified hydatid cyst case was reported in 1944 (Alvarez *et al.*, 1982). The first case of calcified cerebral hydatid on a CT images was done by Alvarez in 1982 after being detected on a plain radiograph of the skull (Alvarez *et al.*, 1982). Linear and round calcifications have been described as radiological findings in hydatid cyst. Round cyst indicates that the cyst is not active (Alvarez *et al.*, 1982). Hydatidosis in endemic

regions present in 3 patients out of each 100,000 (Micheli *et al.*, 1987). Linear calcification of hydatid cyst is even more rare than the round calcification. Most of the hydatid cyst (i.e. 93%) found in young patients below the age of 17-year-old (Micheli *et al.*, 1987). To identify a linear calcified hydatid cyst, it will appear calcified on a plain X-ray (Micheli *et al.*, 1987). According to Micheli *et al.*, the calcified cyst will have the same HU unit as the CSF on a CT scan (Micheli *et al.*, 1987). Most of the hydatid cysts located in the MCA territory and usually above the supratentorial level (Arora *et al.* 2014). All previous findings support the rarity of this case in this patient. Treatment options and prognosis depend on the location of the cyst, the size of the cyst, whether the cyst contents are active, and the complications of the cyst. According to the treatment plan used and to the case circumstances, the prognosis can vary. Surgical intervention, medications injected into the cyst, drainage of the cyst contents, and removal of the calcified wall after are all surgical options. In some instances, the mortality rate can reach 2% (Prousalidis *et al.*, 1999) and in some paper calcification of the cyst indicates the death of the cyst contents which means safe removal of the cyst (Erzurumlu *et al.* 2010).

## Conclusion

To the best of my knowledge, this is the first case of two calcified hydatid cysts, one in the brain and one in the liver. According to the CT scan, the calcification in the liver looks older and the calcification in the brain looks recent. As well, symptoms in the abdomen came earlier than the symptoms in the brain. Similarly, the size of the cyst in the liver is bigger than the size of the cyst in the brain. The above result stated facts led me to conclude that the brain cyst is transmitted from the cyst in the liver.

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