Ultrasonographic Diagnosis of Hepatic Hydatid Cysts in Donkeys

By

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Introduction
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- Echinococcosis or hydatid disease is a cyclozoonontic infection caused by the larval stages of several species of the genus *Echinococcus*. The final host is a carnivore (dogs, foxes...etc) and the larval form occurs in one or more species of herbivorous and omnivorous animals and human (Gordo and Bandera, 1998).
Introduction

- Hydatid disease today constitutes a major public health and economic problem in all continents. In most Mediterranean countries, the disease is hyperendemic in sheep, camels, goats and donkeys (Mukbel et al., 2000 and Haridy et al., 2006).

- Published records of the incidence of equine hydatid cysts are scarce and the majority are based on post-mortem findings. The ante-mortem diagnosis is still difficult depending on serodiagnostic techniques.
Introduction

• Unfortunately no proper studies have been carried out to determine the role of donkeys in the hydatid disease cycle in Egypt. Therefore, the present study was carried out to record-for the first time- the incidence of hepatic hydatid cysts in donkeys by using ultrasound and to assess ultrasonography as a method of diagnosis.
Materials and Methods
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- During the period between May 2003 and May 2006, 45 donkeys (2-10 years old) were randomly selected for hepatic ultrasonography at surgery clinic in Faculty of Veterinary Medicine, Cairo University.

- The ultrasound examination was carried out by the technique described by Smith (2002) and by using a 3.5MHz convex transducer connecting to Toshiba ultrasound just vision system.
Materials and Methods

• In donkeys with hepatic cysts, the cysts were aspirated under local analgesia and ultrasonographic guidance to confirm the diagnosis. Aspiration of 10-20ml of cystic fluid was performed for direct microscopic examination.

• Serum biochemical examinations were carried out on the affected animals to determine albumin, globulin, total bilirubin and gamma-glutamyl transferase values according to Durham et al., (2003).
Materials and Methods

- After euthanasia of the examined animals, post-mortem examinations were made to compare between the ultrasonographic findings and post-mortem findings.
- For histopathological examination, multiple specimens from the cysts and adjacent hepatic tissue were prepared and stained with haematoxylin and eosin.
Percutaneous centesis and aspiration of the hepatic hydatid cyst under u/s guidance
Results
Results

- On hepatic ultrasonographic examination of 45 donkeys, eight donkeys representing 17.8% had hepatic hydatid cysts.
- The affected animals were five males and three females and their age ranged between 5-10 years.
- Ultrasonographically, the cyst appeared as unilocular anechoic rounded, oval or pear-shaped sac inside hepatic parenchyma (7 cases) or protruding from it (one case). All hepatic hydatid cysts showed thin echoic capsule and strong distant enhancement.
Results

- The cysts could be imaged through one or more intercostals spaces.
- The number of the cysts ranged between 1-15 cysts and the diameter ranged between 2.15cm-10cm.
- Percutaneous centesis and aspiration of the cystic fluid under u/s guidance revealed odorless, colorless, transparent fluid which was under pressure. Some cysts had brownish hydatid sand. Microscopically, some cysts were fertile containing protoscolices.
Results

- Biochemical serum tests revealed marked increase in globuline, GGT, total bilirubin and decreased albumine value.
- Histopathologically, the cyst had a thick fibrous connective tissue capsule and the adjacent hepatic tissue showed necrosis and atrophy together with diffuse hepatic fibrosis.
- Subsequent post-mortem examination of all donkeys confirmed the u/s findings with 100% positive predictive value.
Hepatic hydatid cyst at the level of ventral third of the 12th intercostal space
(a) A small-sized (2.15 cm) rounded HHC.

(b) A large-sized (10 cm) pear-shaped HHC.
Two HHC with distant enhancement
(a) Multiple HHC of different shapes and sizes.

(b) Liver specimen of the same donkey.
Liver specimen showing multiple embedded and protruded HHC.
Photomicrograph of the cyst showing thick fibrous capsule surrounded by necrosis and atrophy of hepatocytes.
Summary and Conclusion
Summary

• The incidence of hepatic hydatid cysts in donkeys is 17.8%
• Ultrasound is a good tool for ante-mortem diagnosis of hepatic hydatid cysts with 100% positive predictive value.
• The cyst appears as anechoic sac of various shapes, sizes and location in the liver. It has thin echoic capsule and shows distant enhancement.
Summary

- Percutaneous centesis and aspiration of hydatid fluid under u/s guidance is easy and confirmatory method for diagnosis of hepatic hydatidosis.
- The affected animals show increased total bilirubin, hyperglobulinemia, increased GGT and hypoalbuminemia.
- The cysts make pressure necrosis on the adjacent hepatic tissue leading to hepatic dysfunction.
Conclusion

• Hepatic hydatidosis is a prevalent liver disease in donkeys and ultrasonographic examination is a useful screening tool for its diagnosis in vivo. Future goals are to use ultrasonography in the epidemiological survey, therapy and formulation and evaluation of control programmes for hydatidosis.
Thank You