Case report

Hydatid cyst of lung and liver: Single stage management

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Abstract
A 30 year female presented with history of pain abdomen, abdominal distension since six months, diagnosed to have huge hydatid cysts both in right lung and liver. It is unusual to find such large cysts at multiple sites and organs as in this case. There are reports in the literature of staged management as well as simultaneous management of lung and liver hydatid cysts. Though concomitant cysts in right lung and subphrenic liver may be treated comfortably by one stage surgery of “right thoracotomy with phrenotomy”, here both cysts were enucleated in the same sitting by a combined thoracic and abdominal approach (thoracotomy followed by laparotomy), as cysts were deep in the visceral parenchyma away from diaphragm. The technique is safe and results were comparable to two stage surgery. Albendazole treatment in post-operative period probably helps to prevent recurrence. This report emphasizes that surgical intervention for hydatid cysts at multiple sites done in a single stage is safe, lessens the financial burden & hospital stay by avoiding multiple anesthesia and surgeries.

Key words: Lung and liver hydatid cysts, laparotomy, thoracotomy, phrenotomy, enucleation

Hydatidosis is an endemic zoonosis in Middle Eastern countries, the Mediterranean coast and South Africa. Hydatid disease is a parasitic infection caused by Echinococcus granulosus. Hydatid disease is known to occur in many parts of world, but is relatively rare in India because man, dog, sheep/cattle trio is uncommon in this subcontinent. Liver remains the commonest site and lung involvement ranges from 5% to 44%[1 2]. Preventive measures include observance of strict hygienic standards, exercising of utmost caution in feeding dogs with meat and systemic medication of dogs with anti helminthics (arecolinehydrobromide). Normal method of transmission is by ingestion of eggs, cyst can also develop in the lung if eggs are inhaled. Within 8 hours of swallowed eggs, the oncosphere can be found in the portal venous system and within 21 days, the larval form becomes vesicular and visible to the naked eyes. The brood capsule then detaches by mechanical interference to form daughter cysts which are free from “hydatid sand” in the cyst cavity. The lung hydatid cyst develops extremely slowly and it was observed that the pulmonary hydatid cyst starts developing in childhood and grows for 5 to 20 years before being diagnosed. The laminated membrane in lung hydatid cyst is very thin, so it usually ruptures before it reaches an enormous size. Morphologically, hydatid cyst consists of threelayers and hydatid fluid. The first layer is the pericyst or adventitia which is the host tissue formed by the lung as a
reaction to the foreign body (parasite). The other two layers, the laminated membrane (external layer of the cyst) and the germinative layer (inner layer of the cyst), belong to the parasite. The cyst fluid resembles water in appearance which may contain daughter vesicles.

The clinical presentation of hydatid disease depends on the size and site of the lesion and the accessibility of the organ involved for clinical examination. Pre-operative diagnosis of hydatid cysts can be made ultrasonically and confirmed by a computed tomography (CT) scan. Computed tomogram, plays a major role in the diagnosis and further management of the disease. Different serological tests are being carried out for the diagnosis, screening and post-operative follow up for recurrence. These include the hydatid immune-electrophoresis, enzyme-linked immune-sorbent assay (ELISA), latex agglutination and indirect hemagglutination (IHA) test.

The diagnosis of simple thoracic hydatid cyst is not difficult. Since no effective treatment is available, once the diagnosis of hydatid cyst is made or even suspected, operation becomes mandatory in order to avoid the complications such as anaphylaxis, infection of cyst, pressure symptoms and dissemination due to leak or rupture. A gradual reduction in the antibody reaction after 1-4 years of surgery indicates a complete cure. The definitive cure for pulmonary hydatidosis is still surgical. Several surgical procedures were described for the treatment of pulmonary hydatid cysts using Barrett technique in 1952 (intact endocystectomy without preliminary aspiration), pericystectomy (i.e. Perez-Fontana operation) and lobectomy as described by different authors. Conservative surgical procedure is the treatment of choice in management of uncomplicated pulmonary hydatidosis. Bronchial communication should be closed by purse string sutures. These simple procedures are safe, reliable and successful. However radical procedures should only be carried out in selected patients with specific indications.

Case report

A 30 year old female patient presented with history of pain abdomen, abdominal distension for six months. No other systemic complaints. Ultrasonography of abdomen revealed a large cyst in the liver. Chest X ray raised the suspicion of another cystic mass in the lung also (Fig1). CT of the chest and abdomen was done thereafter, which revealed the presence of large cysts both in the lung and liver (Fig 2 &3).

General anesthesia was given with invasive pressure monitoring. Right lateral thoracotomy was done through sixth intercostal space and the cyst was localized in the superior segment of the lower lobe. Sponges soaked in 10% povodine iodine...
solution were packed around the cyst to prevent spillage. Pericyst was incised, and with gentle positive pressure ventilation, the cyst came out (Fig 4). After enucleation of the cyst, capitonnage of the cavity in the lung was done and bronchial openings found in the cyst were also individually closed with the polypropylene sutures. Standard thoracotomy closure was done after inserting an intercostal tube.

Patient was then turned to supine position and laparotomy was done by upper midline incision. The liver cyst was evacuated using widebore suction carefully avoiding spillage, with betadine soaked packs all around (Fig 5). Because the cyst contains numerous daughter vesicles that are not technically possible to aspirate with a suction device or take out by a grasper, a spoon is used to evacuate the cavity completely. Liver cyst cavity was filled with omentum to prevent collection of fluid and abscess formation. Patient recovered well, but required an abdominal drain for a long period of 1 month for bile leakage which decreased gradually and eventually stopped. Post operative albendazole was continued for 3 months in the dose of 10-20 mg/kg with a gap of 2 weeks after each month (Fig 6).

Discussion

Treatment of hydatid cyst has not changed much over the years, with surgery remaining the mainstay of therapy. Surgery is the treatment of choice for the management of large cysts. Minimal access techniques (thoracoscopy and laparoscopy) are also being used, but the risk of rupture of the cyst may be increased as the cyst wall is usually very thin and spillage of contents cannot be easily minimized. Moreover, packing the surrounding area with sponges soaked in scolicidal solution is also not possible.

Small cysts sometimes resolve with medical treatment with albendazole. Percutaneous aspiration of the cyst, injection of scolicidal agents in the cyst cavity under ultrasonographic guidance and respiration (PAIR technique) has been described in the literature, but there is risk of anaphylaxis and its complications.

The treatment of hydatid cysts is principally surgical. However, pre- and post-operative 1-month course of Albendazole and 2 weeks of Praziquantel should be considered in order to sterilize the cyst, decrease the chance of anaphylaxis, decrease the tension in the cyst wall (thus reducing the risk of spillage during surgery) and to reduce the recurrence rate post operatively7,8. Intraoperatively, the use of hypertonic saline or 0.5% silver nitrate solutions before opening the cavities tends to kill the daughter cysts and therefore prevent further spread or anaphylactic reaction9.
Though concomitant cysts in right lung and subphrenic liver may be treated comfortably by one stage surgery of “right thoracotomy with phrenotomy” to prevent second operation here both cysts were enucleated in the same sitting by a combined thoracic and abdominal approach (thoracotomy followed by laparotomy), as cysts were deep in the visceral parenchyma away from diaphragm. This approach has some advantages that it prevents incision in diaphragm, post-operative respiratory dysfunction and cross contamination.

Reverse Trendelenburg position is helpful during enucleation of the pulmonary hydatid cyst to prevent spillage of contents in the trachea and the dependent lung in case of inadvertent rupture of the cyst while incising the pericyst and enucleation. Use of double lumen endotracheal tube is advantageous to prevent spillage of contents in the trachea and the dependent lung in adults with pulmonary hydatid cyst. CT is the investigation of choice, and presence of hydatid cyst at one site should lead to search at other common sites of its occurrence. Treatment at an early stage can prevent the complete destruction of a lobe requiring lobectomy or major resection.

This report emphasizes that surgical intervention for hydatid cysts at multiple sites done in a single stage is safe, lessens the financial burden and hospital stay by avoiding multiple anesthesia and surgeries.

**Conclusion**

Single stage surgical management of lung and liver hydatid cysts with a combined thoracic and abdominal approach (thoracotomy followed by laparotomy) is a suitable option, especially when the two cysts are deep in visceral parenchyma away from diaphragm. It avoids repeated surgeries and thereby additional cost & hospital stay. It also preserves the diaphragmatic function and prevent cross contamination. Results are quite satisfactory.

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**References**