ABSTRACT
We report three cases of infected and complicated liver hydatid cyst with various presentations; two of which are ruptured infected hydatid cysts and another one case of unruptured infected hydatid cyst with biliary communication. All these cases were managed by prolonged external drainage with or without removal of daughter cyst and Albendazole. It was observed that the allergic and anaphylactic manifestations were not very much pronounced in the case of infected hydatid cyst.

KEY WORDS: Echinococcus granulosus, Infected Hydatid cyst, external drainage.

INTRODUCTION
Patients of Hydatid cyst come to physician’s attention with various presentations. Though complicated Hydatid cyst is a rarity in the western world, it is not uncommon in our part of the world. Here, we report three cases of infected Hydatid cysts presented in General Surgery Unit I of Bir Hospital in the month of Jestha 2065.

Hydatid cyst is the larval cystic stage of Echinococcus granulosus that affect man, its accidental intermediate host.\(^1\)\(^,\)\(^2\) Epidemiological cycle of Echinococcus granulosus parasite is dog-pig-dog cycle; however, dog-sheep-dog, dog-goat-dog and dog-buffalo-dog cycle have also been reported in Nepal.\(^2\) Complicated disease is defined as: infected cysts, cysts with a hyperechoic solid pattern or calcified walls, or cysts with biliary rupture.\(^3\) The incidence of infected Hydatid cyst in the literatures is around 11%.\(^4\) A study spanning 11 years and including 970 cases of hydatid cyst reported incidence of acute intraperitoneal rupture of the hydatid cyst to be just 1.75%.\(^5\) Here, in this paper, we present to you two cases of acute intraperitoneal rupture of infected Hydatid cyst, which was treated in the emergency basis and a case of infected Hydatid cyst diagnosed at the time of elective surgery.

AIM OF THE PAPER
• To depict the varied clinical presentation of the infected hydatid cyst.
• To discuss the mode of management of the infected hydatid cyst.

CASE # 1:
A 78 years old man, smoker from Sarlahi, was presented to us with the complaints of pain and localized fluctuating mass in the upper abdomen for the duration of 2 weeks who developed generalized abdominal pain with distention of abdomen on the next day of admission during USG examination, which revealed free fluid in the abdomen and a cystic mass in the right lobe of liver measuring 19 X 19 cm. The patient also developed shortness of breath with audible wheeze which responded well to Salbutamol nebulization. Immediate laparotomy revealed about 2 litres of pus in the abdomen with a bulge in the anterior surface of right lobe of liver measuring 0.5 cm with pus oozing out of it. The cyst cavity revealed another 1 litre of pus and daughter cysts floating on it. The peritoneal cavity was washed with Normal Saline and the cyst cavity was unroofed, washed with 10% Povidone Iodine and external drain was kept. The drain was accidentally removed on post op day 12. Apart from post operative atelectasis, patient had smooth recovery and was discharged from the hospital on post op day 18 with Albendazole for 3 months.
CASE # 2

A 24 years old girl from Rupandehi was operated in the local hospital for pelvic abscess (? Secondary to appendicular perforation) and 800 ml of pus was drained and was referred to our centre for development of right sided pleural effusion in the post operative period. Patient was toxic with high grade fever and high respiratory rate. She was dehydrated and there was frank pus coming out from the drain. Ultrasound Examination on the next day of admission revealed a complex mass measuring 8 X 8 cm on right lobe of liver suggestive of Hydatid cyst of liver and free fluid in the abdomen with bilateral pleural effusion. However, her ELIZA test for Echinococcus was negative. On aspiration, pus came out of pleural space which was managed with wide bore chest tube drainage. No further intervention was carried out in the abdomen and the drain was removed after 12 days once it was dry. Chest tube was also removed 6 days after insertion and patient was discharged on 18th post admission day on Albendazole for 3 months. She was readmitted after one month with fever and upper abdominal pain and was diagnosed as sub-phrenic abscess which was drained with USG guided aspiration.

CASE # 3

A 50 years old lady from Ramechhap, ultrasonologically and serologically diagnosed Gharbi type 1 Hydatid cyst of liver was being treated medically with Albendazole for 2 months without any benefit was planned for surgery in elective basis. During operation, on aspiration of the cyst, about 2 Litre of purulent pus was obtained.

### Table 1: Clinical presentation of the infected hydatid liver cyst

<table>
<thead>
<tr>
<th>Case</th>
<th>Presentation</th>
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<tbody>
<tr>
<td>1st</td>
<td>Painful localized hepatic mass progressing to generalized peritonitis with allergic chest symptoms</td>
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<tr>
<td>2nd</td>
<td>Right iliac fossa abscess, was diagnosed as ruptured infected hydatid cyst after drainage of the abscess</td>
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<tr>
<td>3rd</td>
<td>Painful liver mass operated electively and was diagnosed as infected hydatid cyst per-operatively.</td>
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10% Povidone Iodine was injected in the cyst cavity and after instilling it for 10 minutes it was re-aspirated and the cyst was emptied of its daughter cyst. External drainage was kept in the cyst space without unroofing it. Drain in the cavity showed bilious content. ERCP and sphincterectomy was carried out on 14th post-operative day and she was discharged on 18th post-operative day with the drain tube. The drain was removed on 30th post-operative day when it became dry.

**DISCUSSIONS**

First and foremost, presentation of the Hydatid cyst from three different regions of Nepal shows its prevalence across Nepal. In a study done in Kathmandu Valley with slaughtered buffaloes and stray dogs around the slaughter houses, occurrence of hydatid cyst was found in 6.7 & 12.5% of slaughtered buffaloes and individual butcher’s places respectively and 12.5% of stray dogs’ faeces sample revealed hydatid eggs. Prevalence of Echinococcus granulosus infection was found to be 5.7% in domestic dogs in the Valley by another study. This shows high prevalence of hydatidosis in the Kathmandu Valley. In a hospital where Hydatid cyst is not one of the commonly encountered problem, three cases of complicated infected Hydatid cyst in a period of one month directs us to keep this pathology as a differential diagnosis in all cases of acute abdomen.

Rupture into the abdominal cavity is a rare but serious complication of hydatid disease. The cysts may rupture after a trauma, or spontaneously as a result of increased intracystic pressure. Rupture of the hydatid cyst requires emergency surgical intervention. But there has been paucity of data regarding specific surgical management of ruptured hydatid cyst. However, a retrospective study of 16 cases of traumatic intraperitoneal and intrabiliary rupture of Hydatid cyst showed lack of single accepted method of surgical management of such patients. Usually, cysts do not induce clinical symptoms before they have reached a size sufficient to exert pressure on adjacent organs and cyst which have already ruptured always attain such a huge size before they get ruptured that procedures like Capitonization, Omental patch, Pericystectomy or Liver resection are practically impossible in such cases. Since adequate information regarding management of complicated infected Hydatid cyst is lacking, our experience shows immediate surgical intervention with peritoneal lavage, removal of daughter cysts, drainage of the cyst cavity and peritoneal cavity are adequate for these cases. Literatures are also not in favor of the medical management once the cyst becomes complicated. Hence, as procedures like pericystectomy, capitonization and omentoplasty are...
not feasible, removal of daughter cyst and simple tube drainage of the infected cyst should be considered as a curative surgery not a palliative surgery as suggested by literatures. Duration of the drainage is not well established in literatures. As we can see in the above mentioned cases, drain needs to be kept for at least 2 weeks until it becomes dry. Lavage and prolonged tube drainage of hepatic cavity is recommended by other authors for free rupture in the peritoneal cavity.

Though spontaneous rupture of the hepatic hydatid cyst into the peritoneum without any serious symptoms is unusual, there have been several reports reporting rupture of hydatid cyst in to the peritoneum causing only mild abdominal pain. In contrary, both of the ruptured hydatid cyst in our series had features of peritonitis. Infection in the cyst could be the cause for that. It has been noted that asymptomatic perforation can result in the development of echinococcal pseudotuberculosis of the peritoneum characterized by a progressive ascites, cachexia and anemia.

Another noteworthy fact regarding ruptured infected hydatid cyst was the incidence of anaphylaxis as a result of intraperitoneal spillage are not as common as once believed. Case # 1 showed some bronchospasm, otherwise there were no other signs of allergic reactions in both cases of ruptured infected hydatid cyst. Similar observation was made by other authors. However, lethal anaphylactic shock was reported in 0.047% of patients during percutaneous aspiration of the Hydatid cyst. Similarly, morbidity and mortality in the post operative period after open surgical intervention was noted to be as high as 35% and 24% respectively and the intraperitoneal recurrence about 8%. Recurrence was observed in a patient whose abdomen had not been washed during surgery.

Lastly, we hope that the findings of this paper will be helpful to those esp surgical residents and surgeons who do not have considerable experience in liver surgeries while managing the cases of complicated hydatid cysts in emergency basis.

CONCLUSION

- Clinical presentations of infected hydatid cyst are varied.
- Management plan varies according to clinical manifestation.
- Allergic manifestations are not present in all cases and are less severe.

- Removal of daughter cyst and external drainage of cyst along with medical management may be the adequate treatment.

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