Traumatic rupture of hydatid cysts

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Objective: To stress the relation between rupture of hydatid cysts and trauma.

Design: A case series.

Setting: A university-affiliated hospital for emergency medicine.

Patients: Four college students who suffered traumatic rupture of hydatid cysts. All injuries were sustained during sporting activities.

Interventions: Resection or unroofing of the cysts with careful removal of all hydatid elements, and suture-plication of the residual liver cavities.

Results: The ruptured cysts were located in the liver, spleen and splenic flexure of the colon. At exploration, additional hydatid cysts were found, usually in the liver. Treatment resulted in complete recovery in all patients.

Conclusions: Traumatic rupture of hydatid cysts related to sporting activities may be commoner than indicated by the rarity of reports. Increased awareness of this possibility in areas where hydatid disease is endemic is encouraged.

Objectif : Insister sur le lien entre la rupture des kystes hydatiques et le traumatisme.

Conception : Étude de cas.

Contexte : Hôpital de médecine d'urgence affilié à une université.

Patients : Quatre étudiants d'université qui ont subi une rupture de kystes hydatiques à la suite d'un traumatisme. Toutes les blessures ont été subies au cours d'activités sportives.

Interventions : Résection ou décompression chirurgicale des kystes, ablation prudente de tous les éléments hydatiques, et plicature des cavités hépatiques résiduelles au moyen de sutures.

Résultats : Les kystes ont éclaté dans le foie, la rate et l'angle gauche du côlon. L'exploration a révélé la présence d'autres kystes hydatiques, habituellement dans le foie. Tous les patients se sont rétablis au complet après le traitement.

Conclusions : La rupture de kystes hydatiques à la suite d'un traumatisme lié à des activités sportives peut être plus fréquente que l'indique la rareté des rapports. On encourage une sensibilité accrue à cette possibilité dans les régions où l'hydatidose est endémique.

Rupture of a hydatid cyst is usually spontaneous. It occurs presumably owing to increasing tension inside the cyst. Although, theoretically, the increasing tension should predispose to traumatic rupture, reports of such occurrences have been rare, and none have been related to sporting activities.[1–5]

We encountered four instances of a ruptured hydatid cyst due to blunt trauma inflicted during various sporting activities. All patients were treated between 1972 and 1986 by one of the authors (S.L.), while serving as chief of the Department of Surgery in the Hospital for Emergency Medicine in Dushanbe,Tadjikistan, USSR.

Case histories

Case 1

A 21-year-old student of physical education received a blow to the abdomen during a soccer game. Because of acute abdominal pain, exploratory laparotomy was performed 4 hours after the accident. The main finding was a ruptured hydatid cyst of the splenic flexure of the colon. The cyst communicated with the lumen of the colon and was infected. There was widespread peritonitis. In addition, two intact hydatid cysts were found in the liver, each one more than 10 cm in di-

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ameter. The splenic flexure was resected, the distal segment of colon was closed and a colopexy of the descending colon done; a proximal colostomy was established. Both cysts in the liver were unroofed. The fibrous pericysts were suture-plicated and drained. One week after the operation the patient's temperature rose to 39 °C. A subphrenic abscess on the right side was diagnosed and was drained through a subcostal incision. Antibiotics were administered parenterally. Six months later the ends of the colon were reanastomosed and the colostomy was closed. The patient was followed up for 12 years and did well.

Case 2

An 18-year-old man complained of severe abdominal pain after wrestling. His abdomen was found to be tender and rigid, suggesting a ruptured spleen. At exploration a ruptured splenic echinococcal cyst was found, and splenectomy was performed. The postoperative course was uncomplicated, and he was discharged on the 10th postoperative day. At follow-up 7 years later he was asymptomatic.

Case 3

A 21-year-old man suffered an elbow blow to his abdomen while playing soccer. During the following hours mild abdominal pain developed, and he was hospitalized for suspected acute appendicitis. Through a McBurney incision, the right lower quadrant was explored. The appendix was normal, but there was a small amount of pus in the peritoneal cavity. To make a more thorough exploration, the McBurney incision was extended pararectally, up to the level of the right costal margin. A ruptured hydatid cyst was found in the right lobe of the liver, penetrating its lateral aspect and adhering to the chest wall. It was 15 cm in the largest diameter. For adequate exposure a portion of the eighth rib was resected, without opening the pleura. The cyst was unroofed, leaving a cavity 8 cm in diameter, which was packed with gauze soaked with a bactericidal acid solution of sodium hypochlorite (Eusol). The gauze was changed daily. After 7 days it was replaced with a balloon made of a rubber glove and filled with saline under tension. Its purpose was to compress the adjacent liver parenchyma and obliterate several small bile ducts opening into the cavity and draining bile. In addition, a tube drain was placed at the bottom of the cavity. Over the next 3 months the cavity filled gradually with granulation tissue, until it was completely obliterated, when the glove balloon was deflated and removed easily. At the same time the tube drain was replaced, until all drainage ceased. During 5 years of follow-up, there was no evidence of recurrence.

Case 4

A 20-year-old man was kicked in the abdomen while playing soccer. Because of abdominal pain, laparoscopy was performed. It demonstrated a subcapsular hematoma in the liver, extending around the gallbladder. The patient remained under observation for 24 hours. During this time his pain increased. Laparotomy disclosed a hematoma and phlegmonous infiltrate in and around the gallbladder. The hematoma was incised, revealing a ruptured hydatid cyst. The gallbladder and the cyst were resected. The fibrous pericyst was plicated with heavy catgut sutures to reduce its size, and a tube drain was left at its bottom. During the following days a gentamicin solution was injected daily through the tube, in addition to the parenteral administration of antibiotics. On the 5th postoperative day the drain, which was still draining hemorrhagic fluid, was accidentally pulled out. An abscess developed in the residual cavity. Nine days after the first operation, a second exploration was carried out to drain the abscess. Five days later bile was noted in the drainage fluid, which amounted to 200 mL/d. Water-soluble contrast medium injected through the drainage catheter demonstrated a small fistulous communication with the biliary tree. The bile ducts were patent, without residual cysts. The fistula was managed by compression of the cyst wall by a balloon made of a rubber glove, as in case 3. The volume of discharge diminished gradually until it ceased, and there was spontaneous closure of the fistula 3 months later. Ultrasonography 1 year later showed no residual cavity.

Discussion

All patients described in this report were college students. The ruptures occurred during sports activities. In a patient infected with *Echinococcus*, the cysts can develop in various organs. With time they become larger, and the danger of a rupture increases. Tension inside the cyst is proportional to the third power of its radius. Accordingly, a very small increase in the size of a cyst results in large rise in tension and proportionately greater risk of rupture. Thus, in a large cyst, minimal trauma may be sufficient to cause the cyst to rupture, with potentially disastrous results. In all our patients, trauma played a major role in causing the cyst to burst. Three of the patients were hit in the abdomen while playing soccer; in the fourth case, the abdomen was repeatedly traumatized during wrestling. In no instance was the presence of a hydatid cyst suspected before rupture — abdominal pain following trauma was the first symptom in each case.

Widespread dissemination of the

parasite and anaphylactic shock are among the well-known complications. Anaphylactic shock did not occur among any of our patients. Likewise, dissemination of the parasite was not observed during a follow-up ranging from 1 to 12 years. Complications in our patients included penetration of a cyst into the colon, ruptured spleen, subhepatic abscess, biliary fistula and a secondarily infected residual cavity in the liver, each in one patient. Virtually all complications can be prevented by early elective resection of the cyst, particularly if it is large. However, many patients are unaware of being infected and harbouring a cyst, as in our four patients. Such unawareness stresses the need for screening programs in those regions where *Echinococcus* is endemic. These programs should be aimed at detecting all carriers of the parasite, particularly those with large cysts. Patients who refuse an operation should be followed-up in clinics and have their cysts periodically evaluated by appropriate imaging techniques. Detection of an increase in size of a cyst should alert the physician to an imminent rupture. Any patient in whom such a development is documented should be advised that resection is indicated without delay.

Drug therapy for hydatid disease is indicated in patients who harbour many cysts in multiple locations, making surgical resection impractical, and in poor-risk patients in whom operation and anesthesia are considered hazardous. However, no conservative treatment is consistently effective. The best results of medical therapy were reported by Morris and associates[6] who achieved a 68% objective response rate with albendazole. The combination of albendazole and praziquantel has been shown to be more effective than either agent alone, at least in vitro.[7] In contrast, surgery offers a consistently effective treatment for living hydatid cysts and is recommended for both symptomatic and asymptomatic cases.[8] In addition to surgery, our patients received antibiotics, but at the time of their treatment albendazole and praziquantel were not used in Tadjikistan.

During elective surgery, all living cyst elements should be removed and spillage prevented. Biliary communications should be closed, and the cavity should be sterilized with a scolicidal agent. The cavity should be plicated and closed. A 1-month preoperative course of therapy with albendazole has been recommended by Morris.[9] This should "sterilize" the cysts and reduce the risk of recurrence.

Management of a ruptured cyst depends on the organ or cavity involved. In addition to resection of the cyst, intrabiliary rupture mandates exploration of the bile ducts, operative cholangiography and removal of all cystic elements. At the conclusion of exploration, choledochoscopy should be performed to ensure complete clearance of hydatid elements from the biliary tree. A T tube should be inserted.[1,10–12] If intraperitoneal rupture has occurred, thorough exploration of the entire peritoneal cavity must be performed to search for residual hydatid elements. The exploration must include the pelvis, the perihepatic spaces and the liver cyst cavity. Finally, a solution of cetrimide, 0.5% or 1%, may be instilled into the peritoneal cavity and must be followed by thorough lavage with large quantities of saline.[8,12]

Intrathoracic rupture occurs rarely. It may involve the pleural cavity or a bronchus, or both, resulting in pleurobiliary or bronchobiliary fistula. Operative exploration should include both the pleural and the abdominal cavities, usually through a thoracoabdominal incision, removal of all cystic elements, closure of the bronchial and the biliary fistulae and suture of the hole in the diaphragm. If closure of the bronchial fistula is impossible, conservative pulmonary resection, such as lobectomy or segmentectomy, may be necessary. If the rupture involves only pleura, not bronchus, the pleural cavity should be lavaged with 0.5% silver nitrate or 0.5% to 1% cetrimide. Pleural drainage is routine.[8,12]

The matter of drainage of the residual liver cavity is controversial. It has been shown that external drainage and marsupialization may result in complications.[4,13,14] Kune and Morris[8] recommended filling the residual cavity with saline and closure without drainage. For the management of infected liver cysts, Kune and Sali[11] advocated obliteration of the cavity by omentoplasty and placement of a tube drain in close proximity. For ruptured cysts we prefer suture-plication of the residual cavity to diminish its size and speed-up its obliteration. The diminished cavity is sutured around a small-calibre catheter that enables control of discharge and provides a route through which antibiotics can be injected and fistulography performed. If the cavity is large and impossible to obliterate by plication, many small bile ducts remain open into the cavity, draining bile. Under these circumstance, we inserted a balloon made of a rubber glove and filled with saline under tension, closing tissues around it. Its purpose was to compress the surrounding liver parenchyma so as to minimize the bile leak and prevent capillary bleeding. The balloon was easily deflated and pulled out after it had served its purpose. Before removal of the catheter, water-soluble contrast medium was injected to verify complete obliteration of the cavity. The obliteration is usually complete within several weeks.

Traumatic rupture of hydatid cysts related to sporting activities may be commoner than the rarity of reports

indicates. We urge increasing awareness of this possibility, particularly in patients from endemic areas.

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Notices
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Advanced Course in Hand Surgery

The 2nd European Advanced Course in Hand Surgery will be held from Oct. 28 to 31, 1996, at the Clinica Ortopedica dell'Università Spedali Civili de Brescia, Brescia, Italy. Included will be sessions on flexor tendons, nerves, congenital hand problems, rheumatoid arthritis, traumatic hand reconstruction and the wrist. All presentations will be followed by extensive discussion. Minilectures on unusual topics will be presented. The working language will be English. For further information contact the Organizing Secretariat, 2nd European Course in Hand Surgery, Studio Progress, Via Cattaneo 51, 25123 Brescia, Italy. Tel.: 39 30 290326; fax: 39 30 -40164.

Quebec Association of Urologists

The 21st annual meeting of the Quebec Association of Urologists will be held from Nov. 22 to 24, 1996, at the Westin Mont-Royal Hotel in Montreal. For more information contact: Ms. Jacqueline Deschênes, Quebec Association of Urologists, 2 Complex Desjardins, East Tower, Door 3000, Montreal QC H5B 1G8. Tel.: 514 350-5131; fax: 514 350-5181.

Asian Surgical Association

The 11th Biennial Congress of the Asian Surgical Association will be held at the Hong Kong Convention & Exhibition Centre from Mar. 2 to 5, 1997. For further information contact: ASA Hong Kong, Congress Secretariat, Department of Surgery, The University of Hong Kong, Queen Mary Hospital, Hong Kong. Tel.: 852 2855 4235; fax: 852 2818 1186; e-mail: **Mededcon@hkucc.hku.hk**

Congress on Ambulatory Surgery

The 2nd International and 4th European Congress on Ambulatory Surgery will be held in at the Queen Elizabeth II Conference Centre, Westminster, London, England, from Apr. 15 to 18, 1997. Under the patronage of the European Commission, the Council of Europe, the World Health Organization and the United Kingdom Department of Health, the congress will run in conjunction with the 8th annual scientific meeting of the British Association of Day Surgery. The working language will be English, with simultaneous translation in French, German and Spanish. For further information contact: Kite Communications, The Silk Milk House, 196 Huddersfield Rd., Meltham, W Yorks HD7 3AP, England. Tel.: 44 1484 854575; fax: 44 1484 854576.

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