The word “robot” was first introduced to the public by Czech writer Karel Capek in his play R.U.R. (Rossum’s Universal Robots) published in 1920 (1). In the course of time, however, robots have become a technological reality, and have begun to be increasingly utilized in many scientific and industrial sections. Although robotic systems have been in use since 1994 in surgery, the da Vinci robot (Intuitive Surgical Inc., Sunnyvale, CA) was approved by FDA for general laparoscopic operations in July 2000 (2). The da Vinci robot is currently being used in various fields such as urology, general surgery, gynecology, cardio-thoracic, and pediatric surgery (2,3).

In this report we presented a case with splenic hydatidosis, treated by robotic splenectomy reported for the first time in Turkey.

A 53 year-old female patient was admitted to our clinics with intermittent abdominal pain persisting for nine months. The patient has been taking medications (Salmeterol discus, BID) for asthma since childhood. She has had caesarean section twice and an open cholecystectomy procedure for gallstone disease fifteen, fourteen, and ten years ago, respectively. There were no abnormalities in routine biochemical test results. Combined abdominal sonography and contrast-enhanced abdominal CT demonstrated a 26x25 mm cystic mass with intensive content and peripheral calcifications in the lower pole of the spleen (Figure 1). Although the serological tests including ELISA and indirect hemagglutination were found to be negative for Echinococcus Granulosus, she was planned for splenectomy with the diagnosis of primary splenic hydatidosis. After 10 days of albendazole therapy, she had been planned for robotic splenectomy. Under general anesthesia in the right lateral decubitus position, the table was flexed and the kidney rest was raised. A pneumoperitoneum of 12 mmHg was established using a Verress needle introduced through a supraumbilical
The movable cart with the robotic arms was positioned on the patient’s left side. Four trocars were placed for the robotic camera and instruments similar to the placements in laparoscopic splenectomy (Figure 2). The robotic arms were connected to the trocars and the dissection was performed with bipolar cautery scissors in the right hand and the Maryland forceps in the left hand. One arm of the robot was used for retraction of the spleen and the table site assistant used an extra trocar for aspiration and hemoclip application when necessary. The peritoneal attachments and splenic ligaments were divided with electrocautery and the splenic hilar vessels were dissected after ligation with hemoclips. Spleen was extracted from the abdomen in an Endobag through the supraumbilical trocar site which was widened to 3 cm long. The whole length of the operation was 230 minutes with 50 minutes spent during “docking” (moveable cart and robotic arms positioning). Patient was discharged on the first postoperative day. Recovery period was uneventful.

Pneumococcus vaccination was carried out on the 14th post-operative day, and albendazole treatment was ceased after 2 months postoperatively.

**DISCUSSION**

Although hydatic cyst is the most common cystic lesion of spleen worldwide, primary splenic hydatid disease is an uncommon clinical entity (4,5,6). Diagnosis of hydatid disease is classically made by combined radiological and serologic investigations including ultrasonography, contrast-enhanced computed tomography, ELISA, and indirect hemagglutination (7). Splenectomy was once the only treatment option for splenic hydatid cysts until the late 1900s; however, partial splenectomy or drainage are the alternative treatment modalities with conventional or laparoscopic approach (8). In our case with a nearly 3 cm in diameter hydatid cyst in a relatively small sized spleen, we preferred performing a splenectomy.

So far, minimally invasive abdominal surgery has been proven to have absolute advantages such as avoidance of an abdominal incision which has potential complications (significant post-operative pain, impairment of pulmonary function), decrease in duration of ileus, and decrease in length of post-operative stay over open abdominal surgery (9-12). The advantages of minimally invasive splenectomy in elective surgery, hematologic diseases in particular, has been well established (13,14). Robotic splenectomy offers not only the advantages of minimally invasive surgery but also some obvious advantages over conventional laparoscopic surgery (15,16,17). Moreover, robotic arms moved by the surgeon replace assistant help, providing minimal number of assistant surgeon per operation.

Although currently with longer operation time and high operational costs, robotic surgery seems to be a little disadvantageous over conventional or laparoscopic surgery, as in advanced laparoscopic surgery with more demanding learning curve with advantages of a high quality three dimensional vision to the surgeon, excellent ergonomics, tremor elimination, ambidextrous capability, motion scaling, and instruments with multiple degrees of freedom acting like the human wrist as in open surgery, classical advantages of minimal invasive surgery such as less postoperative pain, less pulmonary complications, early return to daily activities robotic surgery seems to be a promising technology in surgery.
However, it is important to identify the right indications for the use of the robot simply because of the cost factor as of today. Therefore, future larger studies are necessary for evaluation of these aspects and those results will justify the use of robotic system despite the high cost.

REFERENCES