Images in Pediatric and Congenital Heart Disease

Intra-Peritoneal Migration of an Epicardial Pacemaker Causing Recurrent Vomiting

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Introduction

Migration of an epicardial pacemaker generator to the abdominal cavity is a rare complication reported in both pediatric and adult cases. Symptoms range from mild abdominal discomfort, diarrhea, bowel obstruction, stimulation of the surrounding structures, to potentially life-threatening complications such as colonic perfora-

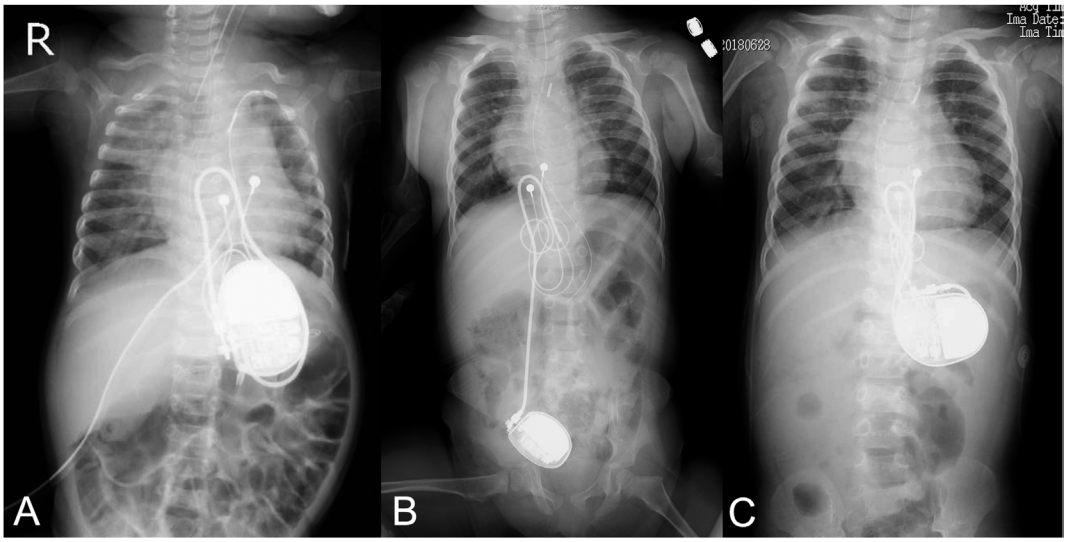

Fig. 1 (A) Radiography of the patient before occurring the migration. The device located in appropriate position. (B) Radiography revealed the migration of the device into the pelvis space. (C) Radiography performed after reimplantation. The device re-located in the generator pocket between the posterior sheath of the rectus muscle and left border of the rectus muscle

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tion.[1] We present a case of an infant with intra-peritoneal migration of an epicardial pacemaker causing symptoms of recurrent vomits.

Case Report

A 10-month-old female infant underwent an epicardial single chamber pacemaker implantation due to post-operative complete heart block following repair for ostium secundum type atrial septal defect (ASD). The patient was a monochorionic-diamniotic twin born at 24 weeks 5 days gestational age with a birthweight of 378 g. The pregnancy was complicated with twin-to-twin transfusion syndrome and postnatally she was managed at the referring neonatal center. She had pulmonary hypertension secondary to chronic lung disease, and remained on mechanical ventilatory support and continuous infusion of epoprostenol. She was transferred to our center for consideration of ASD closure and the surgery was performed at 10-months of age at a bodyweight of 3.0 kg. The patient developed post-operative complete heart block which did not resolve and an epicardial pacemaker implantation was performed one month post surgery. The pacing lead (4968 CapSure Epi 4968, Medtronic) was fixed to the right ventricular epicardium and the generator (Adapta SR ADSR01, Medtronic). The size of the generator was 42.9 mm in height, 40.2 mm in width, and 7.5 mm in thickness. The volume was 9.7 mL, and the weight was 21.5 g. A pocket was created under the left side of the rectus muscle, just above the posterior sheath (Fig. 1A). A part of the posterior sheath was torn because it was very fragile and thin because the patient was very small. It was very difficult to suture the torn posterior sheath. She was transferred back to the referring neonatal center 10 days post device implantation and received ongoing care until 20 months of age. Multiple complications included chronic lung disease, cerebral ventricular enlargement, optic nerve hypoplasia, retinopathy, and panhypopituitarism. She also continued to have frequent episodes of vomits which was thought to be secondary to gastroesophageal reflux. She returned to the outpatient clinic for her first routine pacemaker interrogation at 22 months. The device could not be detected by the programmer head at the original position and was noted to be in the pelvic region. An abdominal X-ray confirmed the migration of the device into the pelvic space (Fig. 1B). Although there appeared to be traction of the lead due to the generator dislocation, the lead continued to show stable thresholds at 1.25 V at 0.4 msec pulse width. In retrospect, previous X-rays performed at the referring center demonstrated migration, however this finding remained unnoticed. Given the risk of potentially life-threatening complications, the decision was to perform a generator reimplantation. An intraperitoneal migration of the device into the Douglas cavity was discovered, with a defect in the peritoneum. The generator pocket was once again created between the posterior sheath of the rectus muscle and left border of the rectus muscle and was further sutured to the posterior sheath (Fig. 1C). The perioperative course was uneventful and the patient was discharged from hospital 5 days post-surgical reimplantation. Since reimplantation of the device, her symptoms of vomits have completely resolved and the patient remains asymptomatic after a follow-up period of 6 months. Cardiac function of the patient was preserved through the course.

Discussion

The migration rate of cardiovascular implantable electronic device is reported to be 0.50% in the adult population, with almost all cases requiring reoperation.[2] An imbalance of a large device size to body size is thought to be one of the risk factors.[2, 3] The prevalence of device migration in children is not known, but it can be postulated that it is higher compared to the adult population given the higher disproportionate size of the device to body habitus in children. In a previous report of epicardial pacemaker migration in a premature infant, the authors concluded that the cause of migration was likely related to the weakness of the abdominal wall, skin, and subcutaneous tissues.[3] The current case weighed only 3 kg at the time of device implantation with minimal subcutaneous tissue due to the complicated perinatal history. There are some options to prevent migration of the pacemaker. Intrathoracic pacemaker implantation is one of the approaches to prevent pacemaker migration in child population.[4] Among the patients with weakness of the abdominal wall, creating a conjoined bilateral subrectus pocket can be an alternative option.[5]

Although epicardial pacemaker migration cause various aspect of symptoms, to the best of our knowledge, this is the first case report of epicardial pacemaker induced vomiting in children. It is postulated that gastrointestinal symptoms are caused by intestinal obstruction as well as electrical stimulation of the bowel by the

migrated device.

In the presence of even mild peritoneal symptoms in a patient with an epicardial pacemaker device, physicians should have a high index of suspicion of pacemaker generator migration. Pacemaker repositioning can be an effective treatment for relieving abdominal symptoms.

Conflicts of Interest

Authors declare no conflict of interests for this article.

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