Case Report

Successful spinal anesthetic management in a case of situs inversus totalis

Hyo Joong Kim

Department of Anesthesiology and Pain Medicine, Haeundae Paik Hospital, Inje University, Busan, South Korea

Situs inversus totalis is characterized that thoracic and abdominal organs are mirrored through the sagittal plane. It can be accompanied by other anomalies including Kartagener syndrome, cardiac defects and spinal malformations. If there are no spinal malformation, spinal anesthesia can be a good anesthetic strategy. (Rawal Med J 201;43:366-368).

Key words: Kartagener syndrome, situs inversus totalis, spinal anesthesia.

INTRODUCTION

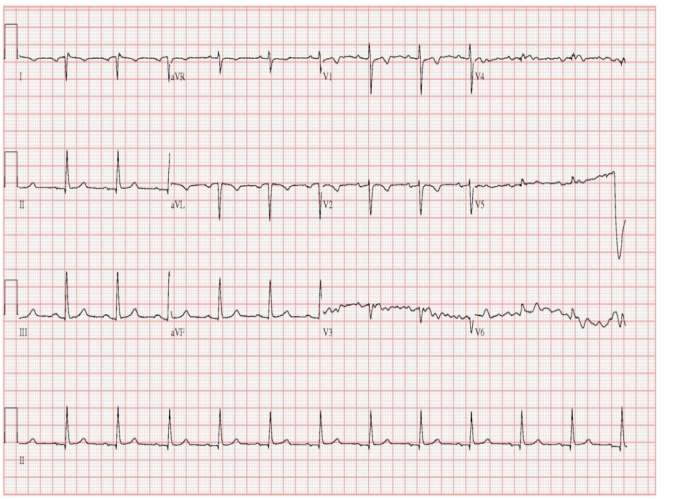
Situs inversus is a rare condition caused by a single autosomal recessive gene.[1] It was described for the first time in 1793 by Baillie.[2] The incidence of it is about 1:10000 of normal population.[3] It is characterized that the major visceral organs including heaet are mirrored from their normal positions. It is sometimes accompanied by other anomalies. Various heart anomalies can occur with situs inversus and the association with spinal dysraphism and other spinal malformations was also reported.[4,5] Many people with it have normal life expectancy, but some have accompanying anomalies that can affect anesthetic management and anesthesiologists should keep this in mind from anesthetic visit. I am reporting a successful spinal anesthetic management of a patient with situs inversus totalis and introducing some anesthetic implications in discussion.

CASE PRESENTATION

A 52-year-old female patient visited emergency department with a chief complaint of left flank pain. A CT scan showed that a stone in left ureter with mild hydroureteronephrosis and situs inversus totalis. She was treated with extracorporeal shock wave lithotripsy as out-patient. One month later, she had same symptom. Another CT scan demonstrated that the stone was still in her left ureter and the urologist decided on a surgical removal.

The first preoperative ECG was performed in routine manner and revealed marked right axis deviation with negative P wave in lead I and regression of R wave in precordial leads (Fig.). So another ECG was taken with reverse lead placement and it showed first degree atrioventricular block but otherwise normal. The cardiologist assessed that echocardiography was not essential and the post-operative cardiovascular risk was 1-5% based on modified Goldman cardiac risk criteria. Chest radiograph revealed dextrocardia and gastric air bubble on right side. Careful preanesthetic visit was performed to evaluate other anomalies except situs inversus totalis. Fortunately, it seemed that there was no accompanying anomaly including spinal malformation. So I decided to perform spinal anesthesia for the operation.

Fig. ECG with negative P wave in lead I and aVL and regression of R waves in precordial leads suggesting dextrocardia.



Noninvasive monitoring was performed. After detection of the spinous process of L5 vertebra, 12mg of 0.5% hyperbaric bupivacaine (Marcaine Heavy®, AstraZeneca, UK) was injected via a 25-gauge spinal needle at the L4-5 interspace. And she was returned to the supine position. After 10 minutes, the sensory block was achieved to T10 and there was no symptom that the patient complained of.

The surgical procedure was uneventful and lasted for only 5 minutes. Her vital signs were stable during surgery and she was sent to postanesthetic care unit (PACU). Her PACU and hospital stay were uneventful and she was discharged next day of the operation.

DISCUSSION

Situs inversus totalis when heart is located in left hemithorax, we call it situs inversus with levocardia.[6] The normal order of organs is called situs solitus. Most patients with situs inversus totalis are asymptomatic and have a normal life expectancy.[7] Situs inversus totalis is known to be associated with lower incidence of cardiac malformations than other heart displacement disorders.[6] Nevertheless, structural cardiac defect, such as ventricular septal defect and transposition of great vessels, and heart rhythm disturbance can be accompanied by situs inversus totalis.[6]

Another important consideration of situs inversus totalis is a Kartagener syndrome.[3,6] It is characterized by primary ciliary dyskinesia with situs inversus totalis. Common clinical manifestations of Kartagener syndrome are chronic sinusitis and bronchiectasis. If these patients need general anesthesia, all precautions to prevent respiratory infection like humidifing the breathing circuit, use of disposable airway equipment, gentle airway manipulations and prevention of aspiration are needed. Hence, some authors recommend regional anesthesia, when it is possible.[3,8] There are few reports of spinal anesthesia in Kartagener syndrome. Kapoor et al[9] used epidural anesthesia for cholecystectomy and Gavai et al[10] used spinal anesthesia for cesarean section. Neuraxial anesthesia is also challenging because spinal deformities such as spina bifida, split cord, meningoencephalocele, etc. can be accompanied by situs inversus totalis.[4]

If the patients have already known about their situs inversus totalis, they should inform clinicians for exact diagnosis and treatment. It is more important in emergency situation such as cardiac arrest and arrhythmias requiring defibrillation. Clinicians should distinguish between dextrocardia and reversed arm leads.

There are some anesthetic considerations when managing patients with situs inversus totalis. Cardiology consultation, ECG and echocardiography can be necessary. Kartagener syndrome should be ruled out. The ECG electrodes and defibrillator pads should be placed in reverse. And because large vessels and thoracic duct are also in the reverse position, left internal jugular catheterization is preferred to avoid thoracic duct. The endotracheal tube can easily enter left mainstem past the carina. So when insertion of double-lumen tube is required, a use of right side double-lumen tube with the aid of fiberoptic bronchoscope can be considered.

In summary, documentation and sharing of situs inversus are important in order to correctly interpret symptoms and prevent clinical mishaps. Precise preoperative evaluations are helpful for clinicians to make anesthetic plans.

Corresponding author email: Hyo Joong Kim: h00386@paik.ac.kr
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