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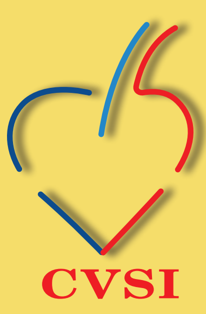

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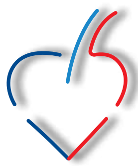

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Case Report Open Access

Concomitant transsternal repair of a congenital Morgagni hernia and ventricular septal defect in a patient with Down syndrome

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ABSTRACT

Congenital Morgagni hernias are uncommon diaphragmatic hernias. Some cases of congenital Morgagni hernias are associated with congenital malformations, including congenital heart defects, chest wall abnormalities, and some chromosomal anomalies. Congenital Morgagni hernias should be treated surgically via transthoracic or transabdominal approach. However, in patients undergoing open heart surgery for congenital heart defects, transsternal exposure and repair can be also used. Herein, we report a case of a ventricular septal defect and congenital Morgagni hernias associated with Down syndrome of which the defects were repaired concomitantly via sternotomy approach.

Keywords: Morgagni hernia; transsternal repair; ventricular septal defect.

Congenital Morgagni hernias (CMH) are uncommon diaphragmatic hernias comprising about 3 to 5% of all types of congenital diaphragmatic hernias.[1,2] Some cases of CMH are associated with congenital malformations, including congenital heart defects (i.e., atrial and/or ventricular septal defects, patent ductus arteriosus), chest wall abnormalities, and some chromosomal anomalies Down syndrome being the most common.[3-5] Once diagnosed, surgical repair is indicated by either transabdominal or transthoracic approach. We, herein, report a case of a ventricular septal defect (VSD) and CMH associated with Down syndrome of which the defects were repaired concomitantly via sternotomy approach.

CASE REPORT

An 11-month-old male with Down syndrome was referred to our institution upon detection of cardiac murmur on physical examination. On chest X-ray, gas-filled loops of the bowel were located within the right chest cavity. Lateral chest X-ray confirmed the diagnosis, showing a retrosternal radiolucent shadow. Echocardiography revealed a 4.5 mm subaortic ventricular septal defect with slight malalignment and a small secundum atrial septal defect. Chest computed tomography scan identified a 1.5×2.7 cm diaphragmatic defect in the right cardiophrenic sinus and loops of bowel within the chest and confirmed the diagnosis of CMH (Figure 1).

We decided to close VSD and to repair the CMH concomitantly. Midline sternotomy was performed. Cardiopulmonary bypass (CPB) was instituted in a routine manner by aortic and bicaval cannulation. The VSD was closed using a Dacron® patch via right atrium. The patient weaned from CPB. Following completion of the cardiac procedure, right parietal pleura was opened. The diaphragmatic defect and the hernia sac which consist the transverse colon inside were visualized anteriorly close to the pericardiac fat. The hernia sac was dissected and lowered to the abdomen throughout the defect. The defect was repaired with a Dacron patch with interrupted sutures. Postoperative period was uneventful. The patient was discharged on postoperative Day 10.

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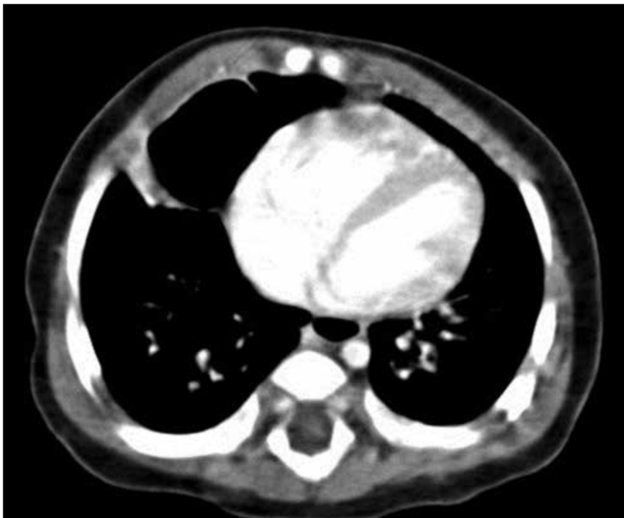

Figure 1. A 1.5×2.7 cm diaphragmatic defect in the right cardiophrenic sinus and loops of bowel within the chest.

DISCUSSION

Anterior congenital diaphragmatic hernia through the foramen of Morgagni was first described by Giovani Morgagni in 1761.[1,6] The defect results from the failure of the fibrotendinous portion of the pars sternalis to fuse with the fibrotendinous part of the costochondral arches.[1,2,6] Most (%90) CMH occur on the right side, 2% on the left side, and 8% occur bilaterally. Pericardial attachment to the diaphragm, which is more common on the left side, supports and protects that side. The most common contents of the hernia sac are the colon, small bowels, liver, omentum, and stomach.[6]

It is well-known that CMH may be associated with other congenital anomalies such as congenital heart diseases, Down syndrome, intestinal malrotation, omphalocele, pectus carinatum, and genitourinary anomalies.[3] However, chromosomal anomalies which are associated with CMH are more significant, in terms of whether it is an inheritable defect.[7,8] In large series, it was reported that the incidence of CMH associated with Down syndrome was approximately 20%.[3] It has also been reported that there is a possibility of muscular deficiency of the ventral paramedian segment of the body wall related to the diaphragm in Down syndrome.[9]

There is a common consensus which CMH should be treated surgically in symptomatic patients. Opinions differ as to the best surgical approach, whether transthoracic or transabdominal.[10,11] However, in patients undergoing open heart surgery for congenital heart defects, as in our case, transsternal exposure and repair is also a possible option.[12] Another controversial issue is the removal of the hernia sac during repair. Although some authors recommend excision of the hernia sac, others prefer to leave it as to avoid the possibility of pneumopericardium.[3,13] However, there is no available data in the literature indicating whether leaving a hernia sac influences the rate of recurrence.

In conclusion, as congenital Morgagni hernias can be associated with congenital cardiac diseases, it should be kept in mind, in patients undergoing open heart surgery via sternotomy approach, that these defects can be repaired with transsternal approach as effective as other approaches without an additional incision.

Declaration of conflicting interests

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REFERENCES

1. Cullen ML, Klein MD, Philippart AI. Congenital diaphragmatic hernia. Surg Clin North Am 1985;65:1135-8.
2. Simson JNL, Eckstein HB. Congenital diaphragmatic hernia: a 20 years experience. Br J Surg 1985;72:733-6.
3. Salem AH, Nawaz A, Matta H, Jacobs A. Herniation through the foramen of Morgagni: early diagnosis and treatment. Pediatr Surg Int 2002;18:93-7.
4. Pokorny WJ, McGill CW, Harberg FH. Morgagni hernia during infancy: presentation and associated anomalies. J Pediatr Surg 1984;19:394-7.
5. Vaos G, Skondras C. Colonic necrosis because of strangulated recurrent Morgagni's hernia in a child with Down's syndrome. J Pediatr Surg 2006;41:589-91.
6. Federico JA, Ponn RB. Foramen of Morgagni hernia. In: Shields TW, LoCicero III J, Ponn RB, editors. General Thoracic Surgery. 5th ed. Philadelphia: Lippincott Williams and Wilkins; 2000. p. 647-60.
7. Enns GM, Cox VA, Goldstein RB. Congenital diaphragmatic defects and associated syndromes, malformations, and chromosome anomalies: a retrospective study of 60 patients and literature review. Am J Med Genet 1998;79:215-25.
8. Slavotinec AM. The genetics of congenital diaphragmatic hernia. Semin Perinatol 2005;29:77-85.
9. Honore LH, Torfs CP, Curry CJ. Possible association between the hernia of Morgagni and trisomy 21. Am J Med Genet 1993;47:255-6.

10. Kurkcuoglu IC, Eroglu A, Karaoglanoglu N, Polat P, Balik AA, Tekinbas C. Diagnosis and surgical treatment of Morgagni hernia: report of three cases. Surg Today 2003;33:525-8.
11. Kiliç D, Nadir A, Döner E, Kavukçu S, Akal M, Ozdemir N, et al. Transthoracic approach in surgical management of Morgagni hernia. Eur J Cardiothorac Surg 2001;20:1016-9.
12. Mert M, Gunay I. Transsternal repair of Morgagni hernia ia a patient with coexistent ventricular septal defect and Down syndrome. Acta chir belg 2006;106:739-40.
13. Berman L1, Stringer D, Ein SH, Shandling B. The late presenting pediatric Morgagni hernia: a benign condition. J Pediatr Surg 1989;24:970-2.

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Interesting Image Open Access

Management of traffic accident related ulnar artery injury

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Penetrating brachial vascular injuries constitute 50% of all penetrating wounds.[1] The majority of penetrating injuries are caused by the stab (57%), gunshots (29%), and other sharp objects (7%). The remaining 6% represents other injuries from road traffic accidents, gunshots injuries, or dog bites.[2] In this report, we present a rare case of a traffic accident in which the wrist of the driver was cut, the ulnar artery was totally disrupted and repaired by the interposition of an autologous vein graft.

A 41-year-old male truck driver was referred to the emergency clinic after a road traffic accident injury with a massive open wound on his right wrist. There was massive bleeding from the wrist region with an extensive dermal tissue loss and tendon damage inside the wound. The ulnar artery was totally cut. He was conscious with a blood pressure of 95/55 mmHg and a heart rate of 92 bpm. Palpation of the peripheral pulses revealed total pulse deficit on the right radial and ulnar arteries. Color Doppler ultrasound showed triphasic patterns in the axillary artery, brachial artery, and radial and ulnar arteries proximal to the level to trauma. The patient was diagnosed with a total disruption of the ulnar artery and an intimal damage of the radial artery.

A written informed consent was obtained from the patient and he was taken to the operating room. Under general anesthesia, the right wrist was explored through a longitudinal skin incision inside the wound. The disrupted ulnar artery edges were reached and were trimmed to be anastomosed. However, the ulnar artery was spasmodic without bleeding. A Fogarty catheter was advanced into the artery proximally. 5,000 IU unfractionated heparin was given intravenously. Massive thrombus was withdrawn from the ulnar and brachial artery. Proximal and distal bulldog clamps were placed to expose the precise arterial ends for anastomosis and to secure the artery from bleeding. A 5-cm long great saphenous vein (GSV) segment was harvested and interposed between the free edges of the ulnar artery. Thus, the ulnar artery was repaired with a GSV graft (Figure 1). As the arterial tissue loss was extensive, end-to-end anastomosis was unable to be done. Polypropylene No. 7/0 with an 8-mm needle was used as the suture material. Bulldog clamps were, then, removed and the arterial deairing was performed. There was no need for intraoperative blood product transfusion. Radial artery remained unoperated, as it had good collateral circulation from the palmar arch. Impaired tendons were repaired by the orthopedics. Gentamicin (160 mg/day), cefazolin (1500 mg/day), metronidazole (1500 mg/day), and acetylsalicylic acid (150 mg/day)

Figure 1. The left arrow showing distal anastomosis and the right arrow showing proximal anastomosis of the great saphenous vein graft interposing the disrupted ulnar artery.

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were prescribed during the postoperative period. The patient was discharged on the postoperative fifth day with intact distal ulnar and radial pulses and with no motor deficit.

In conclusion, traffic accident-related brachial injuries are uncommon, but potentially fatal. An amputation risk of the hand is always present.[2] Vehicle road accidents may cause severe injuries to the vascular structures of the arm, neck, or even the face. The graft interposition is the most preferred type of reconstruction, if there is a gross vascular segmental loss. The great saphenous vein is widely used as an autologous vein graft for these arterial injuries.[3]

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REFERENCES

1. Van Waes OJ, Navsaria PH, Verschuren RC, Vroon LC, Van Lieshout EM, Halm JA, et al. Management of penetrating injuries of the upper extremities. Ulus Travma Acil Cerrahi Derg 2013;19:405-10.
2. Zellweger R, Hess F, Nicol A, Omoshoro-Jones J, Kahn D, Navsaria P. An analysis of 124 surgically managed brachial artery injuries. Am J Surg 2004;188:240-5.
3. Dragas M, Davidovic L, Kostic D, Markovic M, Pejkic S, Ille T, et al. Upper extremity arterial injuries: factors influencing treatment outcome. Injury 2009;40:815-9.

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How to do it? Open Access

A different surgical technique for cardioverter defibrillator implantation in pediatric patients: Pericardial-pleural pocket

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ABSTRACT

There is no particular method for the use of implantable cardioverter defibrillators (ICDs) in the pediatric population. Herein, we present our new technique applied in three pediatric patients.

Keywords: Congenital arrhythmia; implantable cardioverter defibrillator; surgical implantation.

There is no particular method for the use of implantable cardioverter defibrillators (ICDs) in the pediatric population. To date, many techniques have been described by several authors.[1-3] Herein, we present our new technique applied in three pediatric patients.

HOW TO DO IT?

Of three patients who needed ICD implantation, the first was a four-year-old with a ventricular septal defect (VSD) and Brugada syndrome, and the other patients were one and six years old with prolonged QT syndrome, respectively. A written informed consent was obtained from the parents of each patient.

The VSD closure via sternotomy was carried out in the first patient, followed by ICD implantation. In the other two patients, ICD implantation was done via a left thoracotomy through the fourth intercostal space. The ICD system was implanted subcutaneously in the right lower quadrant of the abdomen. A defibrillator lead was tunneled from the abdomen to the left thorax. A pericardial pocket was created with an autologous pericardium on the pleural surface of the pericardium to the planar projection of the left posterior segment of the heart (Figures 1, 2, and 3). The leads were, then, placed in this pocket in a loop shaped fashion (Figure 4). Sensing, pacing, and defibrillation threshold (DFTs) impedances were verified intraoperatively. The optimal configurations of the leads were found by checking the impedances. Sensing and pacing leads were, then, sutured to the anterior wall of the right ventricle.

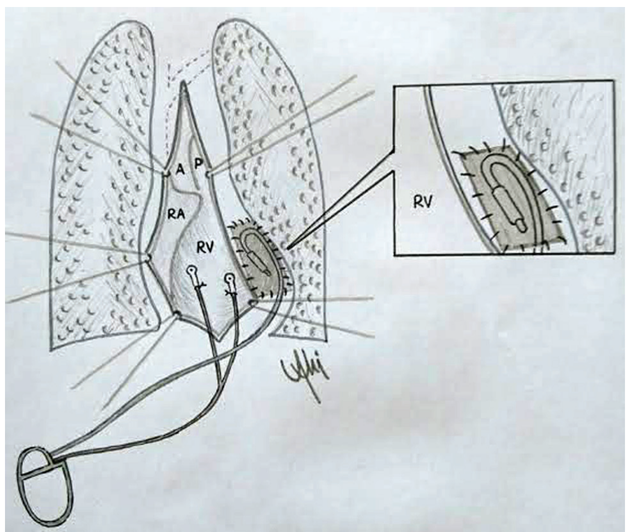

Figure 1. Illustration of the implantable cardioverter defibrillator implantation technique.

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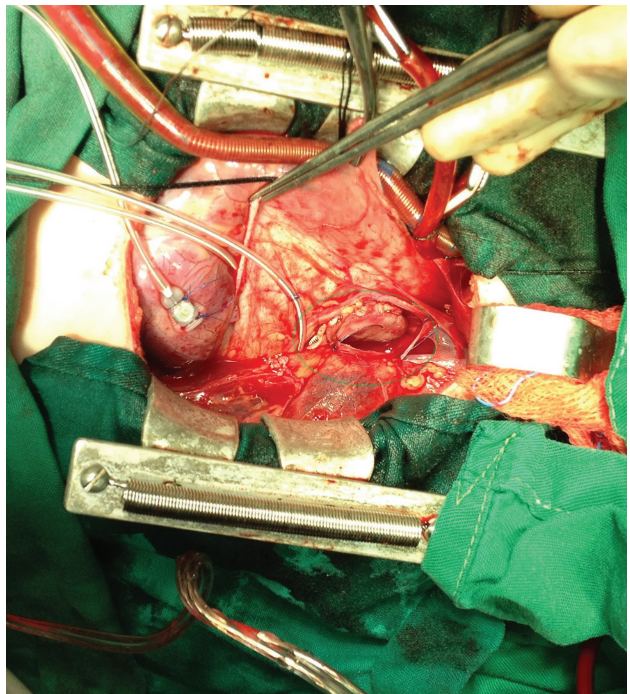

Figure 2. Intraoperative view of the heart and leads.

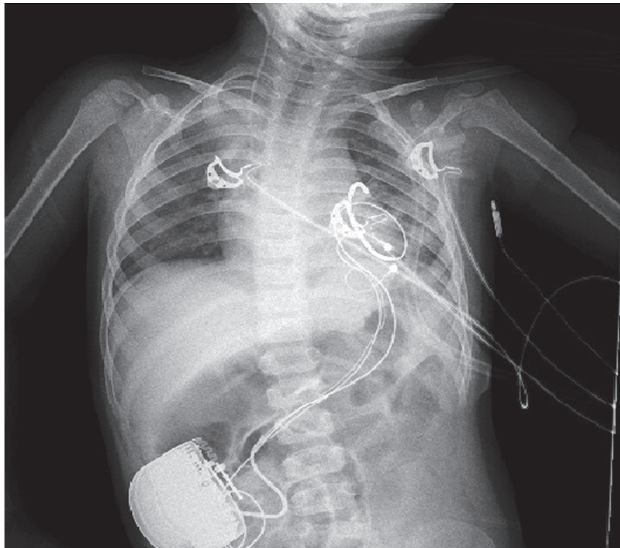

Figure 3. Postoperative chest and abdomen X-ray.

Sensing, pacing, DFTs, and impedances were intraoperatively verified and evaluated at one, three, and six months, respectively. At one year of follow-up of the first patient, there was no deformation in the leads, sensing, pacing, and DFTs (Figure 4). At 14 and 18 months of follow-up of the other two patients, respectively, there were no procedure-related complications. We believe that the pericardial gap can avoid adhesion of the lung and myocardium to the ICD system.

Currently, ICDs have been widely used in children to prevent sudden cardiac death caused by various pathologies. However, a standard implantation technique for children, particularly for infants, has not been established, yet.[2] Transvenous lead placement is not possible for infants and young children due to the presence of small vessel diameters. Therefore, epicardial, subcutaneous, and pericardial ICD implantations should be considered. On the other hand, many of these systems are associated with

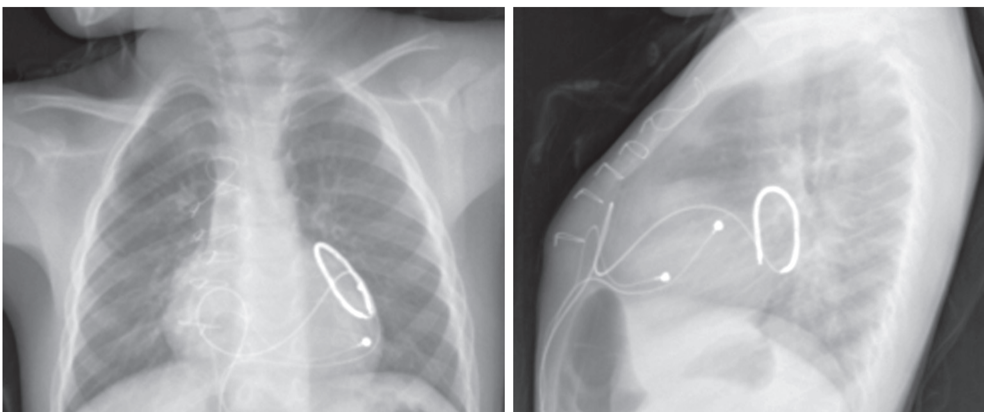

Figure 4. Postoperative third month anteroposterior and left lateral X-ray.

high rates of late complications. In the literature, lead fractures, insulation breakage, migration or buckling of the patch lead and constrictive pericarditis have been reported as the most common lead-related complications.[4,5] We believe that our new technique may decrease complication rates, since the pericardial pocket is a barrier against the adhesions. By avoiding adhesions, positional deformities can be also prevented.

In conclusion, there are many implantable cardioverter defibrillator implantation techniques; however, clinical experiences will show which technique is the most effective and long-lasting.

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REFERENCES

1. Kriebel T, Ruschewski W, Gonzalez y Gonzalez M, Walter K, Kroll J, Kampmann C, et al. ICD Implantation in infants and small children: the extracardiac technique. Pacing Clin Electrophysiol 2006;29:1319-25
2. Suzuki S, Motohashi S, Matsumoto M. Surgical techniques for implanting implantable cardioverter defibrillators in children and infants. Surg Today 2014;44:1801-6.
3. Bové T, François K, De Caluwe W, Suys B, De Wolf D. Effective cardioverter defibrillator implantation in children without thoracotomy: a valid alternative. Ann Thorac Surg 2010;89:1307-9.
4. Korte T, Jung W, Spehl S, Wolpert C, Moosdorf R, Manz M, et al. Incidence of ICD lead related complications during long-term follow-up: comparison of epicardial and endocardial electrode systems. Pacing Clin Electrophysiol 1995;18:2053-61.
5. Chevalier P, Moncada E, Canu G, Claudel JP, Bellon C, Kirkorian G, et al. Symptomatic pericardial disease associated with patch electrodes of the automatic implantable cardioverter defibrillator: an underestimated complication? Pacing Clin Electrophysiol 1996;19:2150-2.