Acute stroke developed just only three patients. In our case, we diagnosed TCMP within 24 hours after acute stroke. Therefore, it is a dilemma that which caused to another? Since patient was relatively young and her symptoms started after a huge emotional stress, we suppose that TCMP developed first and stroke followed it.

Conclusion

We may suggest that when patients are presented with acute stroke especially after an emotional stress and they have low risk of atherosclerotic vascular disease, TCMP should be considered.

Video 1. Transthoracic apical four-chamber view showing the left ventricular apical akinesia

References

1. Kawai S, Suzuki H, Yamaguchi H, Tanaka K, Sawada H, Aizawa T, et al. Ampulla cardiomyopathy (Takotsubo cardiomyopathy)- reversible left ventricular dysfunction: with ST segment elevation. Jpn Circ J 2000; 64: 156-9. [CrossRef]
2. Ogura R, Hiasa Y, Takahashi T, Yamaguchi K, Fujiwara K, Ohara Y, et al. Specific findings of the standard 12-lead ECG in patients with 'Takotsubo' cardiomyopathy: comparison with the findings of acute anterior myocardial infarction. Circ J 2003; 67: 687-90. [CrossRef]
3. Yoshimura S, Toyoda K, Ohara T, Nagasawa H, Ohtani N, Kuwashiro T, et al. Takotsubo cardiomyopathy in acute ischemic stroke. Ann Neurol 2008; 64: 547-54. [CrossRef]
4. Shin SN, Yun KH, Ko JS, Rhee SJ, Yoo NJ, Kim NH, et al. Left ventricular thrombus associated with takotsubo cardiomyopathy: a cardioembolic cause of cerebral infarction. J Cardiovasc Ultrasound 2011; 19: 152-5. [CrossRef]
5. Jabiri MZ, Mazighi M, Meimoun P, Amarenco P. Takotsubo syndrome: a cardioembolic cause of brain infarction Cerebrovasc Dis 2010; 29: 309-10. [CrossRef]
6. Iengo R, Marrazzo G, Rumolo S, Accadia M, Di Donato M, Ascione L, et al. An unusual presentation of "tako-tsubo cardiomyopathy". Eur J Echocardiogr 2007; 8: 491-4. [CrossRef]
7. Song BG, Hahn JY, Cho SJ, Park YH, Choi SM, Park JH, et al. Clinical characteristics, ballooning pattern, and long-term prognosis of transient left ventricular ballooning syndrome. Heart Lung 2010; 39: 188-95. [CrossRef]
8. de Gregorio C, Grimaldi P, Lentini C. Left ventricular thrombus formation and cardioembolic complications in patients with Takotsubo-like syndrome: a systematic review. Int J Cardiol 2008; 131: 18-24. [CrossRef]

Address for Correspondence: Dr. Ali Rıza Akyüz,
Akçaabat Haçkalı Baba Devlet Hastanesi, Kardiyoloji Bölümü,
61300 Akçaabat, Trabzon-*Türkiye*
Phone: +90 462 227 77 77
Fax: +90 462 227 77 89
E-mail: dralirizaakyuz@gmail.com

Available Online Date: 22.08.2014

DOI:10.5152/akd.2014.5497

Complex atrial septal defect referred for percutaneous closure-do we need three-dimensional echocardiography and magnetic resonance imaging?

Karolina Kupczynska, Tomasz Jezewski, Bartlomiej Wozniakowski, Jaroslaw D. Kasprzak, Piotr Lipiec
Department of Cardiology, Medical University of Lodz; Lodz-*Poland*

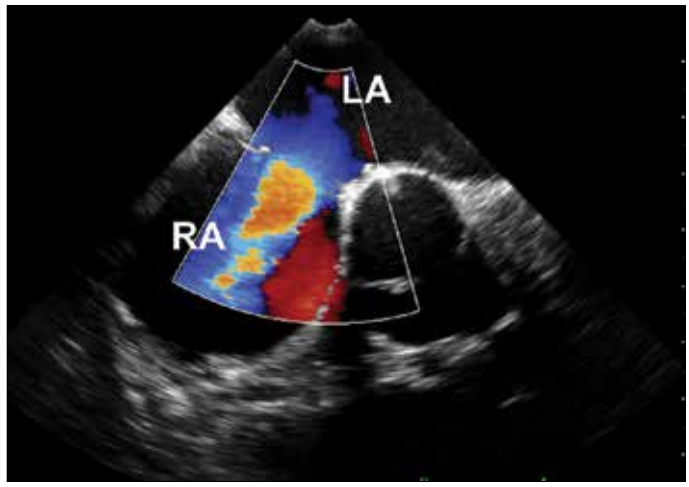

Figure 1. Two-dimensional transesophageal echocardiography-secundum type atrial septal defect with left-to-right shunt. The ASD was measured as 16x18 mm, with the aortic rim of 5 mm and the posterior lateral rim of 8 mm
LA - left atrium; RA - right atrium

Introduction

A complex atrial septal defect (ASD) is defined as a large ASD with a deficient margin or a multi-fenestrated/aneurismal septum (1). The possibility of percutaneous closure is determined by size, localization and tissue rims of an ASD (2-4).

First-line diagnostic method is echocardiography. According to current guidelines cardiac magnetic resonance (CMR) can be an alternative and complementary method to echocardiography in certain situations (2). CMR allows the choice of free-form cut surfaces, unavailable in other techniques (5).

We present a case of patient in whom important additional data were gained based on magnetic resonance.

Case Report

A 54-year-old female patient was diagnosed with secundum type ASD by transthoracic echocardiography (TTE) that revealed interatrial left-to-right shunt with dilated right ventricle. In two-dimensional transesophageal echocardiography (TEE) the ASD was measured as 16 x 18 mm (Fig. 1). However, three-dimensional TEE suggested the ASD may be fenestrated (Fig. 2).

CMR was conducted to verify previous results and to exclude other potential problems. This technique using steady-state free procession and phase contrast sequence revealed fenestrated ASD. The size of first oval defect was 14 x 22 mm, whereas the diameter of adjoining second round defect was 8.0 mm (Fig. 2).

The procedure of occlusion of ASD was conducted with TEE guidance and fluoroscopy. Amplatzer Cribriformis device (40 mm) was implanted in typical manner.

Routine follow-up TEE demonstrated a good result without complications and persistent shunts.

Discussion

We describe an example of fenestrated ASD with discrepancies between standard two-dimensional echocardiography and three-dimensional echocardiography combined with CMR.

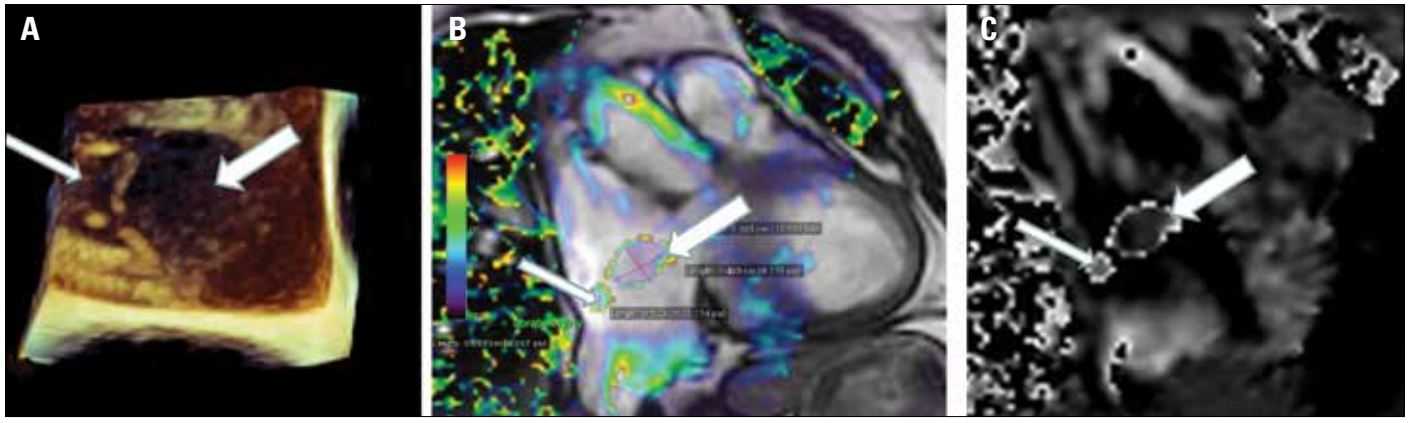

Figure 2. A-C. Left panel. Three-dimensional transesophageal echocardiography-en face view (from the left atrium) of fenestrated secundum type atrial septal defect (ASD). Thick arrow-larger part of ASD, thin arrow-smaller part of ASD. Middle and right panel. Magnetic resonance imaging confirming presence of fenestrated ASD. The size of first oval defect was 14 x 22 mm, whereas the diameter of adjoining second round defect was 8.0 mm, with posterior rim of 6 mm and anterior rim of 15 mm

Echocardiography is still a key diagnostic tool despite important limitations (6). Furthermore, the assessment of septal margins by TEE can be difficult. An obstacle is also inferoposteriorly location of even large ASD (7).

Magnetic resonance imaging provides high spatial and temporal resolution. CMR has an indisputable advantages in relation to sonographic visualization such as lack of restrictions by body size or acoustic windows. It is valuable imaging modality because of not only the ability to identify defects invisible on echocardiograms, but also the possibility of detailed spatial presentation of the atrial septum and accurate assessment of right ventricle. This last feature is especially important in the case of disorders leading to anatomical and functional changes affecting right heart (2, 5).

Most studies assessing pre-occlusion value of TEE and CMR have been conducted in the cohorts of pediatric patients (8). Comparison of TEE and CMR in evaluation of particular data regarding ASD has been published. Patients with 2-dimensional TTE diagnosis of an ASD underwent both TEE and CMR. Authors reported the assessment of maximal atrial defect size was feasible with both techniques, however they identified some difficulties in visualization of margins. Large discrepancies were observed regarding to posterior superior rim (95% vs. 74%) and posterior inferior rim (100% vs. 63%), respectively for CMR and TEE (6).

In another study, authors emphasized the exceptional requirement to exclude possible multiple septum orifices. CMR is able to obtain the en-face views of an ASD. This and more accurate data about adjacent anatomic structures enable the selection of the most suitable therapeutic approach. Obregon et al. (7) observed good correlation between Doppler echo and CMR with respect to the antero-posterior diameter of the ASD. However CMR additionally allowed the assessment of anatomic relationships with the vena cava, the atrioventricular valves and atrial posterior wall.

Patane et al. (9) reported a case of patient in which inter-atrial flow was observed only on CMR performed because of the suspicion of arrhythmogenic right ventricular dysplasia.

In our patient, percutaneous occlusion was successfully performed. This treatment is congruent with both European and American guidelines (class of recommendation: I, level of evidence: B). Careful evaluation is recommended when an ASD is accompanied by large septal aneurysm or atrial septum is multi-fenestrated (2, 10). Transcatheter closure of complex ASD is connected with more frequent procedure-related complications and longer procedural and fluoroscopy time with reference to occlusion of simple ASD (1, 8).

Conclusion

Present case report confirms that echocardiography is main and first-line diagnostic tool, but other and still rarely applied techniques using high-resolution imaging technology may provide additional helpful information. The newest non-invasive technologies help clarify diagnostic and therapeutic dilemmas, but their adequate selection is equally important for avoiding unnecessary duplication of measurements.

References

1. Santoro G, Bigazzi MC, Lacono C, Gaio G, Caputo S, Pisacane C, et al. Transcatheter closure of complex atrial septal defects: feasibility and mid-term results. J Cardiovasc Med 2006; 7: 176-81. [CrossRef]
2. Baumgartner H, Bonhoeffer P, De Groot NM, de Haan F, Deanfield JE, Galie N, et al. ESC Guidelines for the management of grown-up congenital heart disease (new version 2010). Eur Heart J 2010; 31: 2915-57. [CrossRef]
3. Cooke JC, Gelman JS, Harper RW. Echocardiologists' role in the deployment of the Amplatzer atrial septal occluder device in adults. J Am Soc Echocardiogr 2001; 14: 588-94. [CrossRef]
4. Romanelli G, Harper RW, Mottram PM. Transcatheter closure of secundum atrial septal defects: results in patients with large and extreme defects. Heart Lung Circ 2014; 23: 127-31. [CrossRef]
5. Pennell DJ. Cardiovascular magnetic resonance. Circulation 2010; 121: 692-705. [CrossRef]
6. Teo KS, Disney PJ, Dundon BK, Worthley MI, Brown MA, Sanders P, et al. Assessment of atrial septal defects in adults comparing cardiovascular magnetic resonance with transoesophageal echocardiography. J Cardiovasc Magn Reson 2010; 12: 44. [CrossRef]
7. Obregon R, Garcia E, Peloso R, Ferrin L, Escudero T, Franciossi V, et al. Atrial septal defect assessed by cardiovascular magnetic resonance: Comparison with Doppler echocardiography. Rev Argent Cardiol 2007; 75: 30-5.
8. Wang Y, Hua Y, Li L, Wang X, Qiao L, Shi X, et al. Risk factors and prognosis of atrioventricular block after atrial septum defect closure using the Amplatzer device. Pediatr Cardiol 2014; 35: 550-5. [CrossRef]
9. Patanè S, Marte F, Anfuso C, Minutoli F, Coglitore S, Di Bella G. An unusual diagnosis of atrial shunt defect by magnetic resonance imaging. Int J Cardiol 2009; 134: e4-6. [CrossRef]
10. Warnes CA, Williams RG, Bashore TM, Child JS, Connolly HM, Dearani JA, et al. ACC/AHA 2008 guidelines for the management of adults with congenital heart disease. a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing

Committee to Develop Guidelines on the Management of Adults With Congenital Heart Disease). Developed in Collaboration With the American Society of Echocardiography, Heart Rhythm Society, International Society for Adult Congenital Heart Disease, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol 2008; 52: e143-263. [CrossRef]

Address for Correspondence: Dr. Karolina Kupczynska, Department of Cardiology, Medical University of Lodz Kniaziewicza 1/5, 91-347 Lodz-*Poland*
Phone: +48-42-653-99-09
E-mail: karolinakupczynska@poczta.fm
Available Online Date: 22.08.2014

DOI:10.5152/akd.2014.5246

Percutaneous intervention is not always problem-solving in prosthetic paravalvular leakage

Mohammad Hossein Mandegar, Bahieh Moradi*, Farideh Roshanali*, Hossein Nazari Hayano*
Department of Cardiothoracic Surgery and *Echocardiography, Day General Hospital; Tehran-*Iran*

Introduction

Many studies have shown the long-term durability and gratifying results of the Cooley-Cutter valve (1, 2). Nonetheless, many of the complications cannot be prevented or predicted despite optimal prosthesis function in the individual patient; so careful clinical follow-up are, therefore, essential. We report the case of a well-functioning Cooley-Cutter prosthetic mitral valve (PMV), complicated almost four decades after implantation.

Case Report

A 54-year-old man with history of mitral valve replacement (MVR) was admitted to Department of Cardiothoracic Surgery, Day General Hospital; Tehran, Iran. The MVR was performed with a caged- disk Cooley-cutter valve for severe rheumatic involvement in 1975. He reported no serious complaint until the last few years. The patient had undergone two percutaneous interventions for paravalvular leak (PVL) in the last two years.

At admission, the patient presented with increasing dyspnea with New York Heart Association functional Class III. His evaluation revealed a systolic murmur, mild hemolytic anemia, increased lactate dehydrogenase (LDH) and negative blood cultures. The International Normalized Ratio was within target range.

Transthoracic echocardiography (TTE) illustrated a PMV with increased mean gradient (12 mm Hg), Doppler velocity index (DVI)=0.4, effective orifice area (EOA)=1 cm^2, severe pulmonary hypertension (systolic pressure=100 mm Hg), left ventricular ejection fraction about 48%, and moderate tricuspid regurgitation. The detailed transesophageal and real-time three-dimensional echocardiography demonstrated two side-by-side Amplatzer ductal occluder devices (Fig. 1) and confirmed significant stenosis (Video 1) and moderate PVL at the posterior segment of the prosthesis and significant annular calcification.

At operation, the PMV was intact without any dysfunction and no abscess or evidence of endocarditis (Fig. 2). The annulus was heavily calcified, and the sutures were neither cut nor loosened (Fig. 3A). The valve was replaced with a new mechanical valve and retrieval of the occluder devices was performed (Fig. 3B). The tricuspid valve ring annuloplasty was also performed. On postoperative studying, the PMV had mean gradient of 5 mm Hg, the pressure of the right ventricle decreased to 40 mm Hg and there was no residual PVL. LDH decreased dramatically. The recovery was uneventful, and he was discharged 8 days after surgery.

Figure 1. Real-time three-dimensional echocardiography demonstrated two side-by-side Amplatzer ductal occluder devices (white arrow)

Figure 2. The operational view of mitral prosthesis and two Amplatzer occluder devices

Discussion

Most PVLs become apparent in the first half-year after the operation (3, 4), although our patient was complicated with PVL more than 35 years after MVR. The suggested possible causes of late PVLs include long-term degenerative change of the suture site, small tears in the calcified portion, and accumulated stress on the annulus-allowing a small area of detachment and unidentified cured infective process in the remnant valve tissue (4).

The presence of a severely increased gradient cannot be equated with intrinsic prosthesis dysfunction. Hence, a high gradient can be due