pISSN 1975-4612/ eISSN 2005-9655

www.kse-jcu.org
http://dx.doi.org/10.4250/jcu.2014.22.1.6
EDITORIAL COMMENT J Cardiovasc Ultrasound 2014;22(1):6-7

# Incidence and Fate of the Abnormal Septal Motion after Open Heart Surgeries

Jae-Hyeong Park, MD, PhD
*Department of Cardiology, Internal Medicine, School of Medicine, Chungnam National University, Chungnam National University Hospital, Daejeon, Korea*

REFER TO THE PAGE 8-13

Abnormal septal motion (ASM), or septal bouncing, is a paradoxical bouncing motion of the interventricular septum.[1] During early diastolic period, interventricular septum initially directed towards and moves away from the left ventricle. ASM can be found frequently during echocardiographic examinations. If physician or echocardiographer found ASM during their studies, they should bear in mind the causative etiologies including constrictive pericarditis, pericardial tamponade, pulmonary hypertension, septal ischemia, left bundle branch block, congenital absence of pericardium and right ventricular pacing.[2-6] Although they showed similar echocardiographic finding of ASM, their clinical presentations and managements were totally different. Some of them can be differentiate easily. However, some of them should be diagnosed to give appropriate and timely treatment. Of them, constrictive pericarditis is the most important etiology should be ruled out. In one study, sensitivity and specificity of ASM in the detection of constrictive pericarditis were 62% and 93%.[7] They also reported that the presence of vena caval plethora and pericardial adhesion were other echocardiographic findings of constrictive pericarditis and ASM was the most consistent finding among examiners.

ASM can be also seen in patients underwent pericardiotomy during open heart surgery.[8] In the previous study, they showed the incidence of ASM after open heart surgery retrospectively and they found valve surgery is more likely to cause ASM than coronary artery bypass surgery. In this study, the authors demonstrated the incidence of ASM with regular follow-ups, prospectively.[9] There was no report about the chronological sequence of ASM in patients with open heart surgeries. The authors serially checked the incidence and fate of ASM in patients underwent open heart surgery.[9] Interestingly, it appeared about 70% of patients immediately after the open heart surgery. The presence of ASM was associated with lower left ventricular ejection fraction and late mitral filling velocity. However, the authors showed ASM was not associated with myocardial ischemia and disappears with time (25% at 3–6 months and 15% after 1 year). The incidence of ASM in this study was much lower than that of previous report by Reynolds et al.[8] However, their result was a retrospective study and there was inhomogenous time-interval of the postoperative echocardiographic study. Because the authors showed the chronological sequence of ASM in patients underwent open heart surgery prospectively, the manuscript showed unique finding with exact incidence of ASM.[9]

There are several proposed mechanisms of ASM including the injury of interventricular septum during the surgery and the pericardial incision. Although there was no difference between coronary artery bypass surgery and valvular heart surgery in this study, this study showed ischemia of interventricular septum during open heart surgery is not a causative mechanism. Pericardial incision can cause pericardial adhesion and can result in ASM. This study found relatively high incidence of ASM immediately after the open heart surgery. This result indicated that ASM can be associated with the pericardial incision and resultant acute pericardial inflammation, immediately. As pericardial inflammation resolved gradually, the incidence of ASM decreased. However, the persistent ASM after 1 year might be associated with the pericardial adhesion.

However, this manuscript has several limitations. First, the study population was small to show the difference of incidence according to the etiology like previous study. The authors also mentioned this in the limitation part. If they increase the number of patients with strict regular follow-up echocardiographic examination, the results may be more informative in the decision making of the postoperative ASM. Morever, the authors did not compare the persistent ASM and transient ASM groups. If they found and showed the difference between two groups,

• Editorials published in the Journal of Cardiovascular Ultrasound do not necessarily represent the views of JCU or the Korean Society of Echocardiography.
• Received: February 25, 2014 • Revised: March 14, 2014 • Accepted: March 14, 2014
• Address for Correspondence: Jae-Hyeong Park, Department of Cardiology, Internal Medicine, School of Medicine, Chungnam National University, Chungnam National University Hospital, 282 Munhwa-ro, Jung-gu, Daejeon 301-721, Korea
Tel: +82-42-280-8237, Fax: +82-42-280-8238, E-mail: jaehpark@cnu.ac.kr

readers may wait the disappearance of ASM with comfort based on their results.

Because the etiologies of ASM after open heart surgeries can be diverse, prospective studies with a large numbers of patients and a reliable imaging study of pericardial inflammation should be needed.

## References


1. Brinker JA, Weiss JL, Lappé DL, Rabson JL, Summer WR, Permutt S, Weisfeldt ML. *Leftward septal displacement during right ventricular loading in man. Circulation 1980;61:626-33.*
2. Walker CM, Chung JH, Reddy GP. *"Septal bounce". J Thorac Imaging 2012;27:W1.*
3. Hurrell DG, Nishimura RA, Higano ST, Appleton CP, Danielson GK, Holmes DR Jr, Tajik AJ. *Value of dynamic respiratory changes in left and right ventricular pressures for the diagnosis of constrictive pericarditis. Circulation 1996;93:2007-13.*
4. Ryan T, Petrovic O, Dillon JC, Feigenbaum H, Conley MJ, Armstrong WF. *An echocardiographic index for separation of right ventricular volume and pressure overload. J Am Coll Cardiol 1985;5:918-27.*
5. Zoneraich S, Zoneraich O, Rhee JJ. *Echocardiographic evaluation of septal motion in patients with artificial pacemakers: vectorcardiographic correlations. Am Heart J 1977;93:596-602.*
6. Abbasi AS, Eber LM, MacAlpin RN, Kattus AA. *Paradoxical motion of interventricular septum in left bundle branch block. Circulation 1974;49: 423-7.*
7. Himelman RB, Lee E, Schiller NB. *Septal bounce, vena cava plethora, and pericardial adhesion: informative two-dimensional echocardiographic signs in the diagnosis of pericardial constriction. J Am Soc Echocardiogr 1988;1:333-40.*
8. Reynolds HR, Tunick PA, Grossi EA, Dilmanian H, Colvin SB, Kronzon I. *Paradoxical septal motion after cardiac surgery: a review of 3,292 cases. Clin Cardiol 2007;30:621-3.*
9. Kang MK, Chang HJ, Cho IJ, Shin S, Shim CY, Hong GR, Yu KJ, Chang BC, Chung N. *Echocardiographic investigation of the mechanism underlying abnormal interventricular septal motion after open heart surgery. J Cardiovasc Ultrasound 2014;22:8-13.*