

# EXPERIENCE OF TRANSCATHETER DEVICE CLOSURE OF POST MYOCARDIAL VENTRICULAR SEPTAL RUPTURE: BY AMPLATZER POST INFARCT MUSCULAR VSD OCCLUDER VS AMPLATZER SEPTAL OCCLUDER A RETROSPECTIVE REVIEW

Mahua Roy,<sup>1</sup> Nurul Islam,<sup>2</sup> Dr Lalit Lawankar<sup>3</sup>

<sup>1</sup>Nh - Rabindranath Tagore International Institute of Cardiac Sciences; Pediatric Cardiology, <sup>2</sup>The Mission Hospital, Durgapur, West Bengal, India; Ramakrishna Mission Seva Pratisthan, Kolkata, India; Sishumangal Hospital, Kolkata, India, <sup>3</sup>Pioneer Hospital; Pioneer Hospital and Research Center, Nasik, Maharashtra, India; Ped Cardiology

### Background:

Post myocardial ventricular septal rupture is potentially lethal mechanical complication of ST elevation acute myocardial infarction. If left untreated, mortality approaches 90–95% within two months of diagnosis. Till date early surgical repair is the gold standard. However, mortality after early surgical repair is exorbitantly high. Overall, in-hospital or 30-day mortality is 42.9%, the highest of any cardiac surgeries. Due to this high surgical mortality, transcatheter closure has emerged as an alternative strategy in selected cases.

We evaluate our experience of transcatheter device closure of post myocardial infarction ventricular septal rupture by Amplatzer PI -VSD occluder or Amplatzer atrial septal occluder and discussed feasibility, safety, outcome of transcatheter post MI VSR closure and advantages and disadvantages of each device in post MI VSR closure.

# <u>Objective</u>:

The study investigated effectiveness of transcatheter closure of post-myocardial infarction (MI) ventricular septal rupture (VSR) by two different devices (Amplatzer PI-VSD or Amplatzer ASO) in a cohort of patients (16 patients) attempted by three individual operators (pediatric cardiologist), in last 7 years in three different private hospitals.

# Material & method:

This is a retrospective, observational and multi-centre study, which included patients who were taken for transcatheter device closure for post-MI VSR by 3 different operators between January 2015 to December 2021. Primary outcome was all-cause mortality at 30-days follow-up.

Inclusion criteria:

1. Ventricular septal rupture (VSR) due to acute myocardial infarction (AMI) taken to the catheterization laboratory for device closure by three operators (paediatric cardiologist).

Exclusion criteria:

- 1. Ventricular septal defect congenital in origin.
- 2. Ventricular septal defect resulting from a previous cardiac surgical procedure.

Clinical data were collected retrospectively from medical records, procedure reports, transoesophageal echocardiography images, fluoroscopic recording of procedure.

### <u>Result</u>:

A total of 16 patients were included in this present study, mean age of the patient was 65 years (range 52 to 75 years). Predominantly male patients (62.5 %) and female (37.5%) with mean weight of 60 kg (range 46 to 84 kg) was observed in this study. Among these 16 patients, 7 patients (43.7%) had to take for device closure early in their disease process (within 2 weeks of index MI) due to hemodynamic instability, another 9 patients (56.2%) were taken after 2 weeks of index MI.

Mean diameter of VSR was 20 mm (range 10 mm to 25.6mm), in 6 patients Amplatzer PI VSD was used (37.5%), another 10 patients (62.5%) ASO device was used. ASO device size mean of 24 mm (range 16 mm – 30mm) and Amplatzer PI VSD device mean of 18 mm (range 16 to 24mm) were used to closure VSR in this study. No device embolization was documented, in two occasions device came out after deployment before release and successfully closed by larger device. significant numbers of patients had residual shunt (85.7%), immediately after device closure. Procedural success was achieved in 14 patients (81. 25%) whereas 2 patients (12.5%) were succumbed on catheterization table immediately after deployment of devices and cannot be revived. Among 14 patients who had achieved procedural success, 4 patients (28.5%) ultimately died few days after device closure and 10 (71.4%) patients were discharged from hospital.



#### Conclusion:

Post-infarction VSRs are still associated with a very high morbidity and mortality. Transcatheter closure of PI-VSR is a challenging but viable option for these critically ill patients. Amplatzer post myocardial infraction device is available up to size 24 mm, so up to certain size defects (<15mm) can be addressed by Amplatzer PI VSD device for transcatheter closure. As surrounding tissues are soft and friable and there is a possibility of extension of VSR even after couple of days of index myocardial infarction. Device oversizing is the rule not an exception, whereas using septal occlude (ASO) device to close VSR that limitation can be overcome and much larger defect can be closed with favourable procedural outcome. As ASO device is not originally made for VSR closure it has got some limitations. Technically better device may improve overall outcome. However, rim adequacy is a real concern, if culprit vessel is right coronary artery (RCA) then VSR mostly involves basal-inferior septum whereas in case of left anterior descending artery (LAD) involving apical septum, there may not be any rim to hold the device. In case of early vs late device closure if we wait for couple of weeks then patient become more suitable candidate for device closure. Whereas due to hemodynamic instability, patient may succumb before becoming suitable candidate. Individual case to case risk benefit ratio has to judge at the time of selection of patient, time of intervention, type and size of device.