Percutaneous device closure of perimembranous ventricular septal defect: a single center experience

Zhao Lijian1, Han bo1, Zhang jianjun1, Yi yingchun1, Jiang diandong1, Wang jing1, Lv jianli1, Wang yulin1, Zhuang jianxin1.

1 Pediatric Cardiology, Shandong Provincial Hospital Affiliated to Shandong University, China

Objective

To evaluate the safety, efficacy and mid to long term result of percutaneous device closure for perimembranous ventricular septal defect.

Methods

Between June, 2002 and March, 2018, all the patients with congenital perimembraneous ventricular septal defect who underwent percutaneous device closure at pediatric cardiology department of Shandong provincial hospital were enrolled in this study. This is a retrospective single centered study.

Results

A total of 855 patients with congenital perimembranous VSD underwent percutaneous device closure in our center. All patients were followed up regularly untill December 2018. 809 patients were implanted various devices successfully with overall success rate is 94.7% (809/855), 46 (5.3%) patients failed due to miscellaneous reasons. Baseline characteristics are as follows: male patients are 439 and female 416, the mean age was 4.9±7.5 years (1.9～59 years), the mean weight was 23.3±15.0kg (10.0～100.0kg), the mean defect's size measured by TTE was 7.6±3.2mm (2.5～18.1mm), the sub-aortic rim was 2.2 ± 1.3mm (0 ~ 6.0mm) measured by TTE. Perimembraneous VSD associated with septal aneurysm was diagnosed by TTE in 464 (53.0%) patients. A total of 814 VSD devices were implanted in 809 patients, of which 5 patients were implanted with 2 occluders. The average diameter of occluder was 6.4 ± 2.1mm (3.0～18.0mm), and The mean exposure time was 18.4 ± 16.5 min (2.15 min to 150 min). The average hospitalization time was 9.2 ± 2.8d (3.0～32.0d). The main complications post procedure include residual shunt, arrhythmia, valvular dysfunction, with the incidence rate was 17.6%, 10.9% and 7.5%, respectively. One patient had successful device implantation but died of intracranial hemorrhage post operation. 5 patients developed persistent or intermittent complete atrioventricular block post operation, with the incidence rate was 0.6%. Three of them recovered after corticosteroid therapy. One patient was implanted permanent pacemaker at 5 years post operation. One patient was asymptomatic over a period of 20 months follow up

and the patient also refused to take out the device by open heart surgery. The patient was still followed up closely. During a mean period of 51 months follow up, no device embolisation, no infective endocarditis and no worsened or new onset valvular insufficiency was noticed.

Conclusions

Percutaneous device closure for congenital perimembranous ventricular septal defect is relatively safe and effective in selected patients, the mid and long term outcome is favourable.