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# Occurrence and predictors of right ventricular dysfunction after pericardiocentesis

Matsutani H.[1]; Amano M.[2]; Izumi C.[2]; Baba M.[1]; Abe R.[1]; Hashiwada S.[1]; Kuwano K.[1]; Shimada M.[1]; Sakamoto J.[3]; Miyake M.[3]; Tamura T.[3]; Matsuo S.[1]

[1]Tenri Hospital, Department of Clinical Laboratory, Tenri, Japan
[2]National Cerebral and Cardiovascular Center, Department of Cardiovascular Medicine, Osaka, Japan
[3]Tenri Hospital, Department of Cardiology, Tenri, Japan

Background—The changes in cardiac function that occur after pericardiocentesis are unclear.Purpose—This study was performed to assess right ventricular (RV) and left ventricular (LV) function with echocardiography before and after pericardiocentesis.

**Method** and Results—In total, 19 consecutive patients who underwent pericardiocentesis for more than moderate pericardial effusion were prospectively enrolled from August 2015 to October 2017. Comprehensive transthoracic echocardiography was performed before, immediately after (within 3 hours), and 1 day after pericardiocentesis to investigate the changes in RV and LV function. RV dysfunction is defined as meeting three of the four criteria: a TAPSE of <17 mm, an S' of <9.5 cm, an FAC of <35%, and an RV free wall longitudinal strain >−20%. The mean age of all patients was 72.6 ± 12.2 years. The changes of echocardiographic parameters related to RV function are shown in Table. After pericardiocentesis, RV inflow and outflow diameters increased and the parameters of RV function significantly decreased. These abnormal values or RV dysfunction remained at 1 day after pericardiocentesis. Conversely, no parameters of LV function parameters changed after pericardiocentesis. Of 19 patients, 13 patients showed RV dysfunction immediately after pericardiocentesis and 6 patients did not. RV free wall longitudinal strain before pericardiocentesis was higher in patients with post-procedural RV dysfunction (−18.9 ± 3.6%) than in those without (−28.4 ± 6.3%). ROC analysis revealed that a RV free wall longitudinal strain cut-off value of −23.0% had a sensitivity of 100% and a specificity of 83.3% for predicting the occurrence of RV dysfunction after pericardiocentesis (AUC = 0.910).

Conclusions—The occurrence of RV dysfunction after pericardiocentesis should be given more attention. Pre-existing RV dysfunction maybe related to the occurrence of RV dysfunction after pericardiocentesis.

Changes in RV function before and after

| | Before | Immediately after | One day after | P−value |
|---|---|---|---|---|
| Basal right ventricular linear dimension (mm) | 32.8 ± 5.0 | 37.1 ± 4.4† | 33.6 ± 5.4 | 0.028 |
| Mid-cavity right ventricular linear dimension (mm) | 34.5 ± 4.6 | 38.8 ± 5.3† | 37.0 ± 5.6 | 0.0504 |
| Proximal right ventricular outflow diameter (mm) | 30.2 ± 4.0 | 33.9 ± 3.5† | 31.4 ± 3.9 | 0.014 |
| TAPSE (mm) | 20.0 ± 4.2 | 13.6 ± 4.3* | 14.7 ± 3.9 | <0.001 |
| S" (cm/s) | 12.6 ± 3.3 | 8.7 ± 2.4* | 9.1 ± 2.4 | <0.001 |
| Fractional area change (%) | 48.3 ± 5.9 | 37.8 ± 8.0* | 40.0 ± 9.0 | <0.001 |
| Right ventricular free wall strain (%) | −21.3 ± 6.3 | −15.8 ± 6.7* | −16.9 ± 5.2 | 0.036 |
| Tricuspid regurgitation velocity peak (m/s) | 2.41 ± 0.29 | 2.43 ± 0.25 | 2.34 ± 0.32 | 0.37 |