Unloading of right ventricle by bidirectional superior cavopulmonary anastomosis in hypoplastic left heart syndrome patients promotes remodeling of systemic right ventricle but does not improve tricuspid regurgitation.

Abstract:
To evaluate the influence of volume unloading by bidirectional superior cavopulmonary anastomosis on the systemic right ventricle in patients with hypoplastic left heart syndrome. A total of 90 consecutive patients with hypoplastic left heart syndrome, who had survived the early postoperative period after bidirectional superior cavopulmonary anastomosis, were studied. Seven patients were excluded because of tricuspid valve surgery before or in association with bidirectional superior cavopulmonary anastomosis. The echocardiograms of the remaining 83 patients were reevaluated for tricuspid valve regurgitation and the size of the tricuspid annulus before bidirectional superior cavopulmonary anastomosis and at the last available follow-up examination before total cavopulmonary connection. Echocardiograms were performed a median of 5 days before bidirectional superior cavopulmonary anastomosis. Tricuspid valve regurgitation was graded as 0 in 11 patients, I in 37 patients, II in 24 patients, and III in 11 patients. Follow-up echocardiograms were performed a median of 17 months after bidirectional superior cavopulmonary anastomosis. Postoperatively, tricuspid valve regurgitation was graded as 0 in 14
patients, I in 37 patients, II in 21 patients, III in 6 patients, and IV in 5 patients. Postoperatively, the mean Z value of the tricuspid annulus stayed the same in patients with significant tricuspid valve regurgitation (grade III or IV) after bidirectional superior cavopulmonary anastomosis but had decreased in the remaining patients. No significant change was seen in the level of tricuspid valve regurgitation after bidirectional superior cavopulmonary anastomosis compared with the preoperative data. The relative size of the tricuspid annulus in patients with hypoplastic left heart syndrome decreases after bidirectional superior cavopulmonary anastomosis, most likely owing to volume unloading and promotion of the remodeling of the systemic right ventricle. However, this remodeling of the right ventricle does not improve the grade of tricuspid regurgitation.

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