Transapical Beating-Heart Septal Myectomy in Patients With Hypertrophic Obstructive Cardiomyopathy

Objective: To simplify surgical septal reduction therapy for hypertrophic obstructive cardiomyopathy, we developed a novel transapical beating-heart septal myectomy procedure.

Case Video Summary: Transapical beating-heart septal myectomy is a novel surgical procedure for the treatment of hypertrophic obstructive cardiomyopathy and is performed via a mini-thoracotomy using our beating-heart myectomy device. The extent of the myectomy was accurately navigated, monitored, and evaluated by real-time echocardiography. Repetitive resections were performed to achieve sufficient abolishment of left ventricular outflow tract obstruction and mitral regurgitation. Compared with the conventional septal myectomy approach, transapical beating-heart septal myectomy exhibited better visualisation and reduced surgical trauma, without the use of cardiopulmonary bypass, and its therapeutic efficiency was remarkably enhanced. The novel beating-heart myectomy device enabled precise septal resection, while potential debris embolism was prevented. The transapical beating-heart septal myectomy procedure was highly efficient at abolishing left ventricular outflow tract obstruction and showed immediate satisfactory relief of symptoms in hypertrophic obstructive cardiomyopathy patients. In the absence of intrinsic valvular lesions, hypertrophic obstructive cardiomyopathy-induced mitral regurgitation was alleviated upon sufficient septal myectomy, and concomitant mitral surgery was mostly unnecessary. The transapical beating-heart septal myectomy procedure was applicable to all subtypes of hypertrophic obstructive cardiomyopathy and was technically less demanding (over much shorter procedural durations) than the conventional on-pump approach, so the former procedure will be easier to be disseminated than the latter.

Conclusions: Transapical beating-heart septal myectomy is feasible, safe, and efficient at abolishing left ventricular outflow tract obstruction and will improve the clinical outcomes of surgical septal reduction therapy in patients with hypertrophic obstructive cardiomyopathy.

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