A new technique to avoid the intraoperative complications of septal myectomy in patients with obstructive hypertrophic cardiomyopathy

Abstract Although transaortic septal myectomy in obstructive hypertrophic cardiomyopathy (OHC) is accepted as a safe procedure, it may end up with serious peroperative complications. We developed a practical method to avoid this unfavorable outcome by using a 20-cc syringe body. We believe this apparatus will provide safe and effective septal myectomy procedures without additional cost.

Key words Septal myectomy · Obstructive hypertrophic cardiomyopathy · Electrocautery

Introduction

The surgical management of left ventricular outflow tract (LVOT) obstruction secondary to hypertrophic cardiomyopathy (HCM) has clinically consisted of septal myectomy. In some cases with additional pathologies of mitral valve, alternative methods such as plication of the mitral valve anterior leafl et or papillary muscle release have been proposed. Although transaortic septal myectomy in obstructive hypertrophic cardiomyopathy (OHC) is accepted as a safe and effective procedure, it may end up with peroperative complications such as aortic leafl et injuries, conduction system injuries, and mitral valve and chordae injuries. One of the other possible complications is the embolization of the septal myocardial fragments that fall into the left ventricle cavity during the myectomy. We developed a practical method to avoid this unfavorable outcome.

Method

A rectangular-shaped piece of 1 cm width and 3–4 cm length is cut out from a 20-cc syringe body with a scalpel. The opening at the tip of the syringe is blocked from the inside with glue, which is allowed to dry. The apparatus is then sterilized with ethylene oxide (Fig. 1).

In the operation, the syringe is placed in the left ventricle cavity through aortotomy so that the opening on the syringe faces the hypertrophied septal myocardium (Fig. 2). Myectomy is performed with an appropriately sized loop electrosurgical electrode plugged to cautery (Fig. 3). The septal myocardial tissue fragments are collected in the syringe.

Discussion

Obstructive hypertrophic cardiomyopathy is a myocardial disease characterized by asymmetrical hypertrophy on the ventricle wall. It is the most prevalent genetic disorder of the heart among adults, with a prevalence of 1/500. Transaortic septal myectomy has been performed effectively in all patient groups of all ages with OHC for over 40 years as the primary treatment strategy and have proved to be successful with its short- and long-term hemodynamic and symptomatic benefit. Secondary ventricular septal defect, total atrioventricular block, bleeding, dehiscence, septice- mia, intraoperative remyectomy, and cerebral and pulmonary emboli are among the complications of the surgical procedure. In experienced centers, the operative mortality and morbidity for isolated septal myectomy in both children and adults is low (approximately 1%) and continues to improve.
Despite all the attention of the surgical team, unavoidable embolism of the myectomy particles that fall into the left ventricular cavity may occur during the procedure. There are examples of cerebrovascular events following septal myectomy in the literature. Chan and Silver reported fatal myocardial embolus after myectomy.7 Chang et al. used a loop electrosurgical electrode and reported that the electrically excised fragments were attached to the loop electrode and easily removed, hence dislodgement of the resected muscle leading to embolization was avoided.8 We combined the use of a loop electrosurgical electrode with the syringe apparatus to collect the septal muscle fragments and therefore reduced the chance of dislodgment of the pieces.

In the aforementioned method, the closed tip of the syringe helps to collect the fragments that have the potential to fall into the ventricular cavity. On the other hand, the smooth nonconducting plastic surface of the syringe acts like a shell and protects the leaflets, subvalvular apparatus,