

Case Report

Volume 7 Issue 3 – August 2017
DOI: 10.19080/JOCCT.2017.07.555711

J Cardiol & Cardiovasc Ther
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Perioperative Transesophageal Echocardiography in Myectomy Procedure -4 Cases Report



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Submission: August 08, 2017; Published: August 29, 2017

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Abstract

Background: Asymmetric septal hypertrophy is the most prevalent form of hypertrophic cardiomyopathy. The aim of this series of cases is to demonstrate the measures performed by perioperative transesophageal echocardiography (TEE) during myectomy procedures.

Methods: A retrospective analysis of the echocardiography exams from patients who underwent myectomy procedure from January 2015 to January 2017 was developed. Were excluded patients who underwent emergency surgeries, combined surgery and patients who had already septal coronary artery alcoholization.

Results: A total of 4 patients were evaluated in the period from 2015 to 2017. They were all women, ASA 3 with a mean age of 61±8,7 years old. The left ventricle outflow tract (LVOT) peak gradient pre-CPB was 114,4±50,6mmHg and post-CPB was 42,4 46,3mmHg. The LVOT mean gradient pre-CPB was 52,4±19,9mmHg and post-CPB was 21,4±25,6mmHg. The mitral coaptation-septal distance (C-sept) pre-CPB was 1,4±0,4cm and post-CPB was 2,2±0,2cm. The vena contracta pre-CPB was 0,5±0,2cm and post-CPB was 0,4 ±0,3cm. The ejection fraction pre-CPB was 66,5±1,3% and post-CPB was 53±2,7%. The CBP clamp time was 50,3±30,7min and the CPB time 82±42,6min. One patient died in the ICU due a low output syndrome after CPB.

Conclusion: The perioperative TEE assisted in the decision making regarding the anatomical structures to be resected, evaluated the severity of mitral regurgitation before and after resection and guided the surgical team regarding the LVOT peak gradient and C-sept distance.

Background

Asymmetric septal hypertrophy (ASH) is the most prevalent form of hypertrophic cardiomyopathy [1]. In ASH, the systolic anterior movement (SAM) of the mitral valve develop a dynamic obstruction in the left ventricular outflow tract (LVOT) that can cause low cardiac output and pulmonary edema [2]. Among the forms of treatment, myectomy surgery stands out [1-3]. Patients with labile obstruction, peak LVOT pressure gradients ≥ 50 mm Hg during exercise, resting gradients >30 mm Hg and patients with NYHA class II through IV symptoms refractory to medical therapy are the ones that will benefit from the surgical procedure [1]. The aim of this series of cases is to demonstrate the measures performed by perioperative transesophageal echocardiography during myectomy procedures.

Methods

After approval by the Ethics Committee of Santa Casa de Misericórdia of Juiz de Fora, retrospective analysis were developed in the echocardiography exams from patients underwent myectomy procedure from January 2015 to January 2017. Were included in these study patients between 18 to 70 years, ASA 3 and 4. The exclusion criteria were emergency surgeries, combined surgery, and patients who had already septal coronary artery alcoholization. All patients were monitored with pulse oximetry, 5-lead cardioscopy, invasive blood pressure, central venous pressure and transesophageal echocardiography (TEE). They were submitted to balanced general anesthesia with etomidate

(0.3mg/kg), fentanyl (5mcg/kg), rocuronium (0.6mg/kg) and sevoflurane 2%. After intubation, the TEE probe was introduced and perioperative TEE exams were performed following the intraoperative TEE SCA/ASE guideline [4]. Parametric data are expressed as mean ± standard deviation and categorical data in absolute numbers and percentages.

Results

A total of 4 patients were evaluated in the period from 2015 to 2017. Preoperative demographic data and preoperative echocardiographic data are shown in Table 1.

Table 1: Demographic and echocardiographic data in the preoperative period.

Data	Values
Patients, n	4
Age, years	61±8,7
Weight, Kg	63±8,3
Height, cm	158±5,0
Feminine gender, n (%)	4 (100)
ASA 3	4 (100)
SAH, n (%)	4 (100)
Diabetes Mellitus, n (%)	0 (0)
Syncope during exercise, n (%)	1 (25)
Chest pain, n (%)	4 (100)
Pulmonary edema, n (%)	1 (25)
Ejection fraction (%)	66,5±1,3
Left ventricle weight, g	301,5±1.2
End diastolic volume, ml	101,8±10,1
End systolic volume, ml	29,7±8,9

ASA: American Society of Anesthesiologists physical status; SAH: Systemic Arterial Hypertension

Perioperative echocardiographic data are shown in Table 2.

Table 2: Perioperative echocardiographic data.

Perioperative TEE Data	Values
Peak gradient pre-CPB, mmHg	114,4±50,6
Peak gradient post-CPB, mmHg	42,4±46,3
Main gradient pre-CPB, mmHg	52,4±19,9
Main gradient post-CPB, mmHg	21,4±25,6
C-sept pre-CPB, cm	1,4±0.4
C-sept post-CPB, cm	2,2±0,2
CV pre-CPB, cm	0,5±0.2
CV post-CPB, cm	0,4±0,3
Ejection fraction pre-CPB, %	66,5±1,3
Ejection fraction post-CPB, %	53,0±2,7

CPB: Cardio Pulmonary By-Pass; C-sep: distance between de mitral valve tip and the septal hipertrophy, CV: Contract Vein

The Figure 1 shows the LVOT obstructed by the anterior mitral leaflet (AMVL).

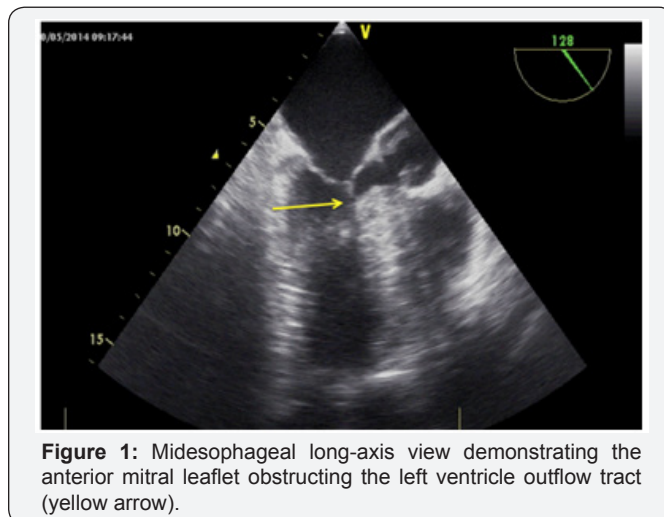


Figure 1: Midesophageal long-axis view demonstrating the anterior mitral leaflet obstructing the left ventricle outflow tract (yellow arrow).

The distance of mitral valve leaflets tip and the septal hypertrophy (C-sept) can be observed in the Figure 2.

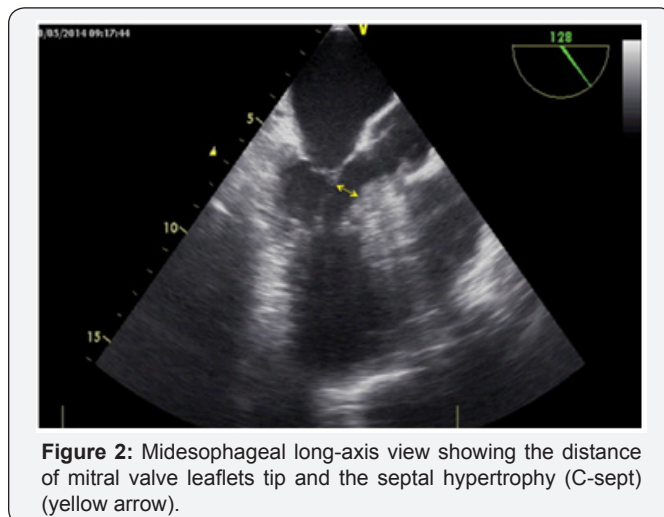


Figure 2: Midesophageal long-axis view showing the distance of mitral valve leaflets tip and the septal hypertrophy (C-sept) (yellow arrow).

In the Figure 3A & 3B can be observed the SAM leading to an important mitral regurgitation and after the cardiopulmonary by-pass (CPB), the mitral regurgitation is mild.

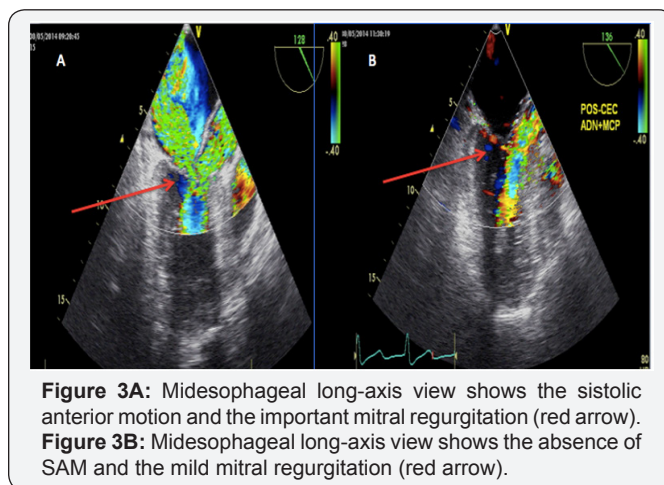


Figure 3A: Midesophageal long-axis view shows the systolic anterior motion and the important mitral regurgitation (red arrow). **Figure 3B:** Midesophageal long-axis view shows the absence of SAM and the mild mitral regurgitation (red arrow).

Figure 4 shows the variation of the LVOT peak gradient between the pre-CPB period and the post-CPB period and the

assessment of the distance between de mitral valve tip and the septal hypertrophy (C-sept) between the pre-CPB periods with the post- CEC.

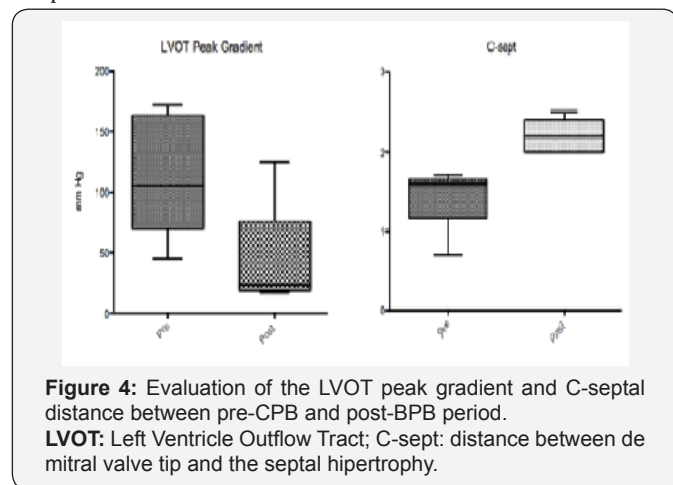


Figure 4: Evaluation of the LVOT peak gradient and C-sept distance between pre-CPB and post-BPB period. **LVOT:** Left Ventricle Outflow Tract; **C-sept:** distance between de mitral valve tip and the septal hipertrophy.

Table 3 shows the clinical outcome of the patients, the time of intubation in the ICU, length of ICU stay and hospital mortality.

Table 3: Patient’s clinical outcomes.

Clinical Outcomes	Values
CPB clamp time, min	50,3±30,7
CPB time, min	82±42,6
Tracheal intubation time, hours	32±27,0
Time of length in ICU, days	5±2,4
Perioperative LOS, n (%)	1 (25)
Death in hospital, n (%)	1 (25)

CPB: Cardiopulmonay By-Pass; ICU: Intensive Care Unit; LOS: Low Output Syndrome

Discussion

In these 4 cases of septal myectomy procedure, the perioperative TEE assisted the decision making regarding the anatomical structures to be resected. TEE also showed possible complications of the procedure like ventricular septal perforation, aortic regurgitation, mitral regurgitation and persistent LVOT obstruction [1-3]. We concluded in our study, that myectomy procedure increases the C-sept distance and decreases the SAM, leading a lower LVOT peak gradient and lower mitral regurgitation [1-3].

References

- Hensley N, Dietrich J, Nyhan D, Mitter N, Yee MS, et al. (2015) Hypertrophic cardiomyopathy: A review. *Anest analg* 120(3): 554-569.
- Hymel BJ, Townsley MM (2014) Echocardiographic assessment of systolic anterior motion of the mitral valve. *Anest analg* 118(6): 1197-1101.
- Coyne JT, Alfirevic A (2013) Reorientation of an obstructive, hypermobile papillary muscle: Intraoperative echocardiographic assessment. *Anest Analg* 116(5): 989-992.
- Hahn RT, Abraham T, Adams MS, Bruce CJ, Glas KE, et al. (2013) Guidelines for performing a comprehensive transesophageal echocardiographic examination: Recommendations from the american society of echocardiography and the society of cardiovascular anesthesiologists. *J Am Soc Echocardiogr* 26(9): 921-964.



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DOI: 10.19080/JOCCT.2017.07.555711

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