

Commando Procedure Through Right Anterior Thoracotomy Approach: A Single-center Experience

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BACKGROUND: This study aims to investigate the possibility of aortic and mitral valve replacement with reconstruction of the intervalvular fibrous body (Commando procedure) through right anterior thoracotomy (RAT) approach.

METHODS: From June 2022 to November 2024, 10 patients undergoing primary Commando procedure via RAT approach(third intercostal space) were retrospectively analyzed at Department of Cardiovascular Surgery, First Affiliated Hospital of Xi’ an Jiaotong University. Right jugular vein, femoral vein and artery were cannulated to establish cardiopulmonary bypass(CPB). Custodiol-HTK cardioplegia were used in all cases. All cases were operated by a single senior cardiac surgeon.

RESULTS: Three patients were male and the median age was 45.5 years(IQR, 41.5-48.8 years). Rheumatic heart disease with mitral and aortic stenosis were seen in 6 patients (60.0%). 2 patients had infective endocarditis with intervalvular fibrous body involvement and degenerative disease with anterior mitral annular calcification were seen in 2 patients. The median pre-operative mitral annulus was 33.5mm(IQR, 30.3-34.8 mm) by transthoracic echocardiogram (TTE), and the median aortic annulus was 19.5mm(IQR, 17.5-20.8 mm). Bioprosthetic valves were used in 2 patients(25-mm mitral valve and 23-mm aortic valve in 1 patient, 29-mm mitral valve and 25-mm aortic valve in the other). For patients with mechanical valves 23-mm aortic prostheses were used in 4 patients, 25-mm aortic prostheses in 3 and 21-mm aortic prosthesis in 1 patient. 27-mm mitral prostheses were used in 6 patients, 25-mm mitral prostheses in 1 and 29-mm mitral prosthesis in 1 patient. Combined surgeries included tricuspid annulopalsty in 2 patients, left atrial appendage closure in 6 patients. The median CPB time was 166 minutes(IQR, 161-180 minutes), and median aortic cross-clamp time was 134 minutes(IQR, 132-151 minutes). There were no conversions to full sternotomy or re-exploration for bleeding. The median post-operative red blood cell transfusion was 2 unit (IQR, 1.3-2.8 unit). There were no in-hospital deaths. The median ventilation time was 20.8 hours (IQR, 19.0-21.8 hours). The median ICU stay was 3.0 days (IQR, 2.3-3.8 days). Only one patient need postoperative permanent pace-maker insertion. There were no observed deaths in the follow-up period (median 10.5 months, [IQR, 8.3-13.1 months]). No permanent pace-maker insertion was needed during follow-up. During latest TTE the median trans-aortic gradient was 12.0 mmHg(IQR, 11.1-12.9 mmHg), and median trans-mitral gradient 8.0 mmHg(IQR, 7.6-8.6 mmHg).

CONCLUSIONS: Minimally invasive Commando procedure through RAT approach was possible and associated with low morbidity and mortality according to this small case series. We believe that patients should be carefully selected and it should be performed by experienced hands because of its more challenging technical nature. Large cohort study is warranted for its safety and reproducibility.

Demographic data	
median age	45.5 (IQR 41.5-48.8)
Male	3 (3.3%)
Valve lesion	
rheumatic	6(60%)
infective	2(20%)
degenerative	2(20%)
Preoperative mitral annulus(mm)	33.5 (IQR 30.3-34.8)
Preoperative aortic annulus(mm)	19.5(IQR 17.5-20.8)
Intraoperative data	
bioprosthetic valve use	2(20%)
mechanical valve use	8(80%)
combined surgery	
tricuspid annulopalsty	2(20%)
left atrial appendage closure	6(60%)
median CPB time(min)	166 (IQR 161-180)
median cross-clamp time(min)	134 (IQR 132-151)
Postoperative data	
red blood cell transfusion(unit)	2 (IQR 1.3-2.8)
median ventilation time(h)	20.8 (IQR 19.0-21.8)
median ICU stay(d)	3.0 (IQR 2.3-3.8)
permanent pace-maker insertion	1(10%)
Follow-up TTE	
median trans-aortic gradient(mmHg)	12.0 (IQR 11.1-12.9)
median trans-mitral gradient(mmHg)	8.0 (IQR 7.6-8.6)

