

Mini-incision Full Sternotomy Aortic Valve Replacement. Short- And Long-term Results On 91 Consecutive Patients

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Background:

Minimally invasive procedures for aortic valve replacement are progressively gaining ground over conventional full sternotomy. The most common incision for minimally invasive aortic valve replacement is the partial upper J ministernotomy. Aortic annulus is situated at the level of the fourth to fifth intercostal space which is deeper than our working plane when performing upper J ministernotomy. The aim of this study is to describe our experience with a mini-incision (7cm), full sternotomy approach for minimally invasive aortic valve replacement. Our skin incision was placed at the middle of the sternum, being, after sternum division, exactly at the level of aortic annulus.

Methods:

All patients who benefited from a mini-incision full sternotomy for aortic valve replacement from a single surgeon in our hospital, from January 2013 to December 2018 (n=91) were identified. Baseline demographics, perioperative and postoperative data were extracted from each patient's medical records.

Results:

All, non-redo, aortic valve replacements from January 2013 to December 2018 were performed by the above-mentioned minimal invasive technique by a single surgeon. Continuous variables were reported as median (25%-75% quartiles) and dichotomous as percentage. Ninety one patients with a median body mass index (BMI) of 27,8 (24,9- 32,8), a euroscore II of 1,9 (1,1- 3,2) and an age of 72 (65- 79) were operated by a single surgeon. The median cross clamp and bypass time was 57 (51- 68) and 82 (73- 96) minutes. Post-operative and intensive care unit length of stay was 10 (7- 12) and 2 (1-4) days. Thirty days mortality, acute cerebrovascular event and acute myocardial infarction were 1/91 (1,1%), 3/91 (3,3%) and 0/91. One mediastinitis was observed in our series. An up to 9,5 years Kaplan Meier survival curve is annexed.

Conclusion:

Aesthetics and respect of patient's integrity is a major motor for minimal invasive surgery. This approach gives better exposure of the aortic valve in comparison to J ministernotomy with a better cosmetic result because skin incision is placed lowest in the thorax. It is easier than J ministernotomy and applicable to all patients, with no preoperative selection criteria, with excellent post-operative outcome.

Keywords:

Aortic Valve Replacement, MICS-AVR, Ministernotomy





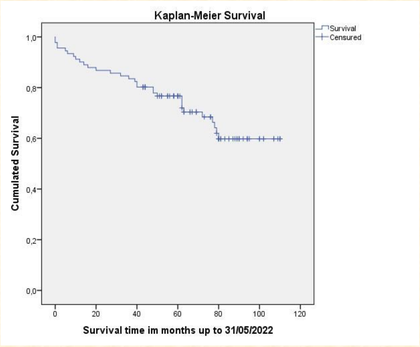


Mini-incision Full Sternotomy AVR (n= 91)

All consecutive single surgeon AVR from 01/01/2013 to 31/12/2018

Demographic Data

Age in years, median (IQR)	**72 (65- 79)**	Preoperative AF, n (%)	**14/91 (15)**
BMI, median (IQR)	**27,8 (24,9-32,8)**	Preoperative presence of a PM, n (%)	**4/91 (4)**
Male Gender, n (%)	**45/91 (49)**	Chronic Lung Disease, n (%)	**28/91 (31)**
Euroscore II, median (IQR)	**1,86 (1,13-3,22)**	Cerebrovascular accident, n	**7/91 (8)**
Creatinine clearance, median (IQR) (ml/min)	**74,4 (56,2-99)**	Active Endocarditis, n (%)	**5/91 (6)**
Impaired Renal Function, n (%)	**53/91 (58)**	Elective surgery, n (%)	**81/91 (89)**
Diabetes, n (%)	**29/91 (32)**	NYHA III or IV, n (%)	**39/91 (43)**
Tobacco history, n (%)	**20/91 (22)**	Good LVEF (>50%), n (%)	**72/91 (79)**
Hypertension, n (%)	**81/91 (89)**	Reoperation, n (%)	**1/91 (1)**
Hypercholesterolemia	**71/91 (78)**		



Mini-incision Full Sternotomy AVR (n= 91)

Perioperative Data and Results

Biological Valve, n (%)	**86/91 (95)**	Need for transfusion, n (%)	**31/91 (34)**
Rapid Deployment Valve, n (%)	**4/91 (4)**	Deep Wound Infection 30 days, n (%)	**1/91 (1)**
Prosthetic Valve Diameter, median (IQR) (mm)	**23 (21- 25)**	New onset postoperative AF, n (%)	**35/91 (39)**
ECC Time, median (IQR) (min)	**82 (73- 96)**	Reoperation for bleeding, n (%)	**8/91 (9)**
Cross Clamp Time, median (IQR) (min)	**57 (51- 68)**	New PM implantation, n (%)	**5/91 (6)**
Postoperative length of stay, median (IQR) (days)	**10 (7- 12)**	Stroke at 30 days, n	**3/91 (3)**
Intensive Care Unit length of stay, median (IQR) (days)	**2 (1- 4)**	Myocardial Infarction at 30 days, n (%)	**0/91**
Postoperative intubation time, median (IQR) (hours)	**17 (8- 21)**	Infective Endocarditis at 30 days, n(%)	**0/91**
Conversion to sternotomy, n (%)	**3/91 (3)**	Mortality at 30 days, n	**1/91 (1)**

Mini-incision Full Sternotomy AVR (n= 88, 3 lost on follow-up)

Inclusion 01/01/2013 to 31/12/2018, Follow Up: 31/05/2022

Long Term Results

Stroke, n (%)	**5/88 (6)**	Infective endocarditis, n (%)	**1/88 (1)**
Myocardial Infarction, n (%)	**2/88 (2)**	Structural Valve Deterioration, n (%)	**6/88 (7)**
Atrial Fibrillation, n (%)	**12/88 (14)**	Mortality, n (%)	**30/91 (33)**
Reoperation for AVR, n (%)	**0/88**	Reoperation for bleeding, n (%)	**8/91 (9)**
Infective endocarditis, n (%)	**1/88 (1)**		