

Results of Mitral Valve Repair for Barlow Disease via Right Minithoracotomy vs. Conventional Median Sternotomy: a Randomized Trial



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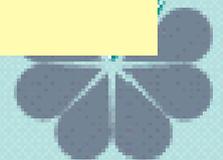
Durability of mitral valve repair in Barlow disease versus fibroelastic deficiency

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J Thorac Cardiovasc Surg 2008;135:274-82

“When optimal surgical techniques are used ... long-term results of mitral valve repair in Barlow disease are essentially the same as in

IS THAT TRUE EVEN AFTER MINIMALLY INVASIVE REPAIR FOR BARLOW DISEASE OF THE MITRAL VALVE?



Minimally Invasive Surgery



Problems?

- Too complex
- Difficult learning curve
- Needed trained ancillary groups (concerns over safety)
- Antegrade or Retrograde perfusion?
- Too expensive



Solutions!

- Simplify the complex
- Abandon robotics and fiberoptics
- Make it reproducible in hands of surgeons and use conventional skills
- Femoral perfusion
- Cut costs and OR time



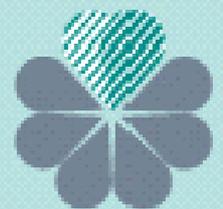
'Barlow' valve: definition

- 1. Hoodlike bulging of different portions of the anterior leaflet**
- 2. Multiple bulging posterior scallops**
- 3. Excess tissue and prolapse**

- All criteria had to be satisfied.
- Based on preoperative echocardiographic assessment.

STUDY OBJECTIVES

To compare the feasibility, the operative results and the follow-up outcomes (recurrence of mitral regurgitation, need for mitral reoperation) among patients undergoing mitral repair for Barlow disease using either the median sternotomy approach vs. a less invasive strategy through right minithoracotomy, peripheral cannulation, and direct vision.



Results of mitral valve repair for Barlow disease (bileaflet prolapse) via right minithoracotomy versus conventional median sternotomy: A randomized trial

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(J Thorac Cardiovasc Surg 2010; ■ :1-7)

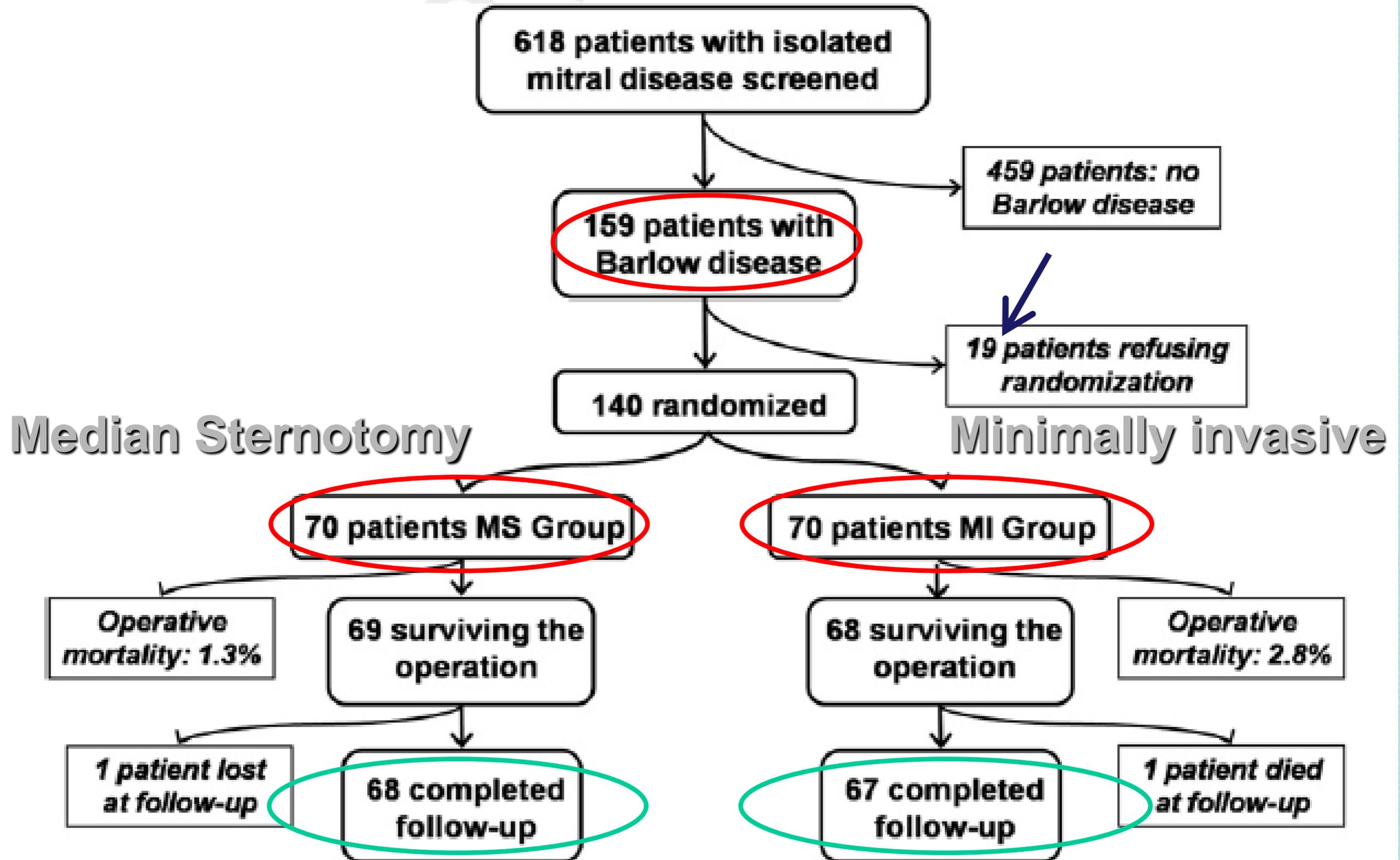
Inclusion criteria

- Isolated, severe MR with indication to undergo elective reparative surgery
- Etiology of mitral regurgitation is Barlow's disease of the valve
- Patients are fully informed and willing to enter the study

Exclusion criteria

- Any contraindication to right minithoracotomy and femoral cannulation
- Associated coronary disease, associated any more than mild valvular dysfunction, associated any congenital defect

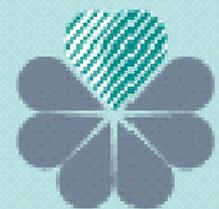
STUDY DESIGN – Prospective Randomized Trial



Minimally Invasive Mitral Valve Repair



- The same concepts and standardized surgical protocols were adopted for mitral repair in both Groups.
- Artificial chordal PTFE implantation for both leaflets plus semirigid ring annuloplasty were used in all cases.



RESULTS

Baseline characteristics

Characteristic	MI group	MS group	<i>P</i>
Age (y)	53.2 ± 10.4	54 ± 10.1	.68
Sex (male/female)	41/29	43/27	.86
NYHA class III-IV	21 (30%)	19 (27%)	.85
Preoperative AF (n)	16 (22.8%)	18 (25.7%)	.84
Preoperative LVEF < 50% and > 35% (n)	11 (15.7%)	12 (17.1%)	.99
Preoperative LVEF < 35% (n)	2 (2.8%)	2 (2.8%)	—

MI group, Minimally invasive treatment group; *MS group*, median sternotomy treatment group; *NYHA*, New York Heart Association; *AF*, atrial fibrillation; *LVEF*, left ventricular ejection fraction.

*Reduced LVEF is not a contraindication anymore



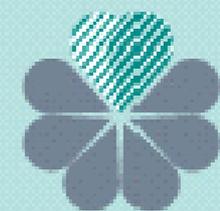
RESULTS

Intraoperative

Characteristic	MI group	MS group	<i>P</i>
CPB time (min)	139 ± 28	101 ± 24	.012
Aortic crossclamp time (min)	92 ± 23.3	70 ± 18	.02
Operative time (min)	296 ± 118	249 ± 91	.003
Conversion to mitral replacement (n)	1 (1.3%)	0	.8
Average number of prolapsing segments per patient	2.9 ± 0.6	3.0 ± 0.6	.89
Average No. of neochordae per patient	5.4 ± 0.9	5.6 ± 1.0	.53
Average No, of treated segments per patient	2.8 ± 0.6	2.9 ± 0.5	.77

Longer CPB time, aortic cross-clamp time and operative time were recorded in the MI group.

Nonetheless, the features of mitral repair procedure were similar among the groups, including the average number of prolapsing mitral segments per patient, the number of neochordae implanted per patient, and the number of mitral segments treated per patient.



RESULTS

Early postoperative

Characteristic	MI group	MS group	P
ICU stay (d)	2.1 ± 0.9	3.2 ± 1.1	.02
Mechanical ventilation time (d)	1.2 ± 0.2	2.3 ± 0.5	.014
Revision for bleeding* (n)	4 (5.7%)	3 (4.3%)	.99
Overall bleeding (mL/m ²)	759 ± 387	741 ± 370	.63
Patients transfused with blood products (n)			.85
Hospital stay (d)			.03
Myocardial infarction* (n)			.99
Postoperative renal failure* (n)			—
Neurologic complications* (n)			.99
Femoral complications*† (n)	0	—	—
Wound infection* (n)	0	1 (1.4%)	.99
Operative mortality (n)	2 (2.8%)	1 (1.3%)	.99
Postoperative pain: 2nd day	2.8 ± 0.9	4.7 ± 1.3	.001
Postoperative pain: 4th day	2.3 ± 0.8	5.1 ± 1.5	<.001
Postoperative pain: 6th day	1.5 ± 0.4	3.1 ± 0.9	.002

**All major operative morbidity:
comparable rates**

- Minimally invasive surgery was significantly associated with:
1. Shorter ICU stay and shorter mechanical ventilation
 2. Shorter total hospital stay
 3. Reduced pain (visual analogic scale) through the 2° to the 6° postoperative days



RESULTS

Follow-up

Characteristic	MI group	MS group	<i>P</i>
End-of-follow-up overall mortality	3 (4.3%)	1 (1.4%)	.61
Mild MR (n)	1	2	.99
Moderate or severe MR (n)	2	1	.61
Mitral reoperation (n)	1	1	.99

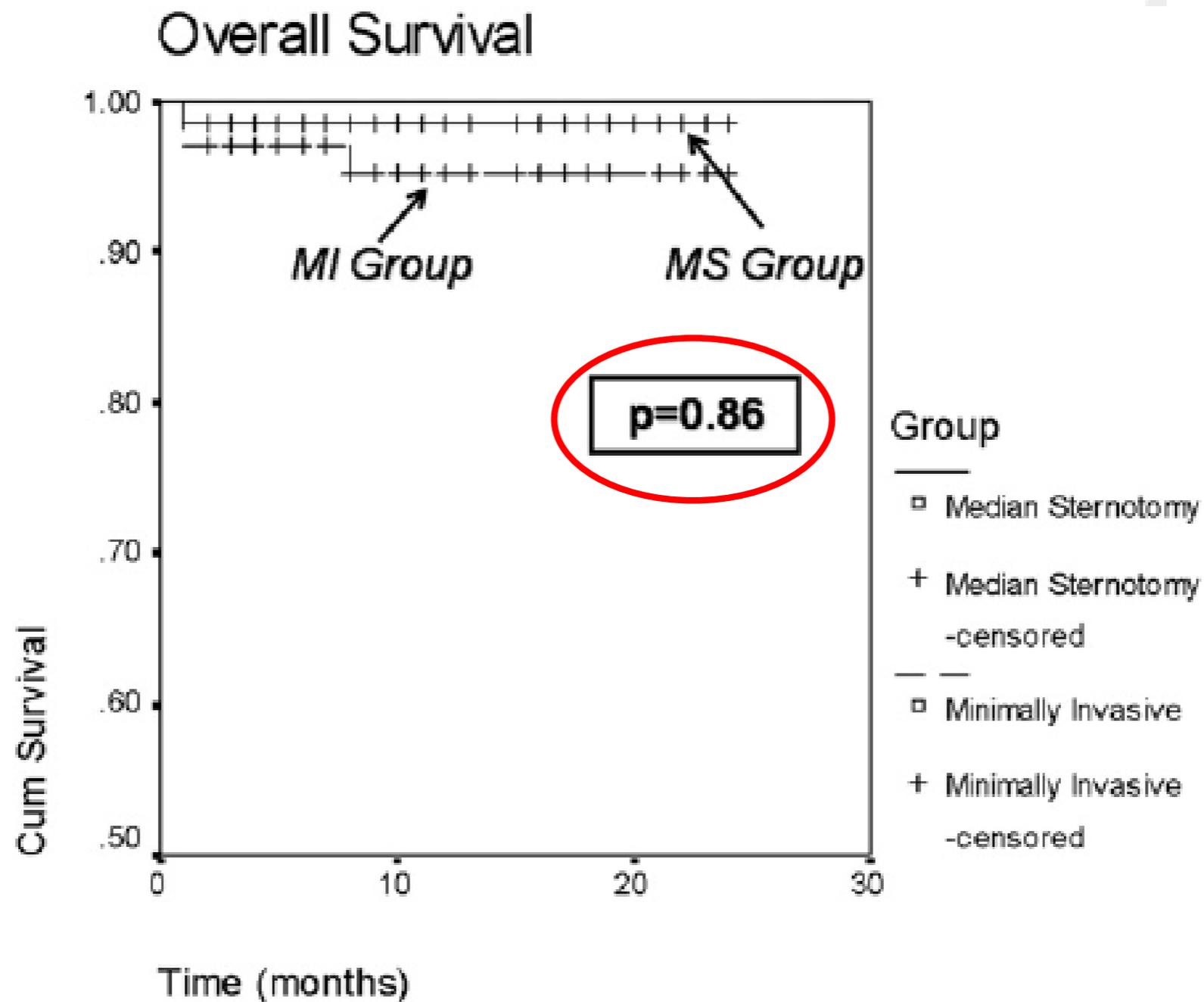
MI group, Minimally invasive treatment group; *MS group*, median sternotomy treatment group; *MR*, mitral regurgitation.

The study Groups (median sternotomy vs. minimally invasive) were comparable with respect to the incidence of clinically significant recurrent mitral regurgitation and of mitral reoperation during the follow-up



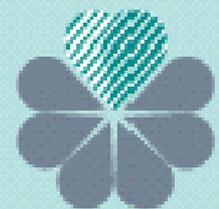
RESULTS

Overall survival at Follow-up (K-M)



Patients at risk:

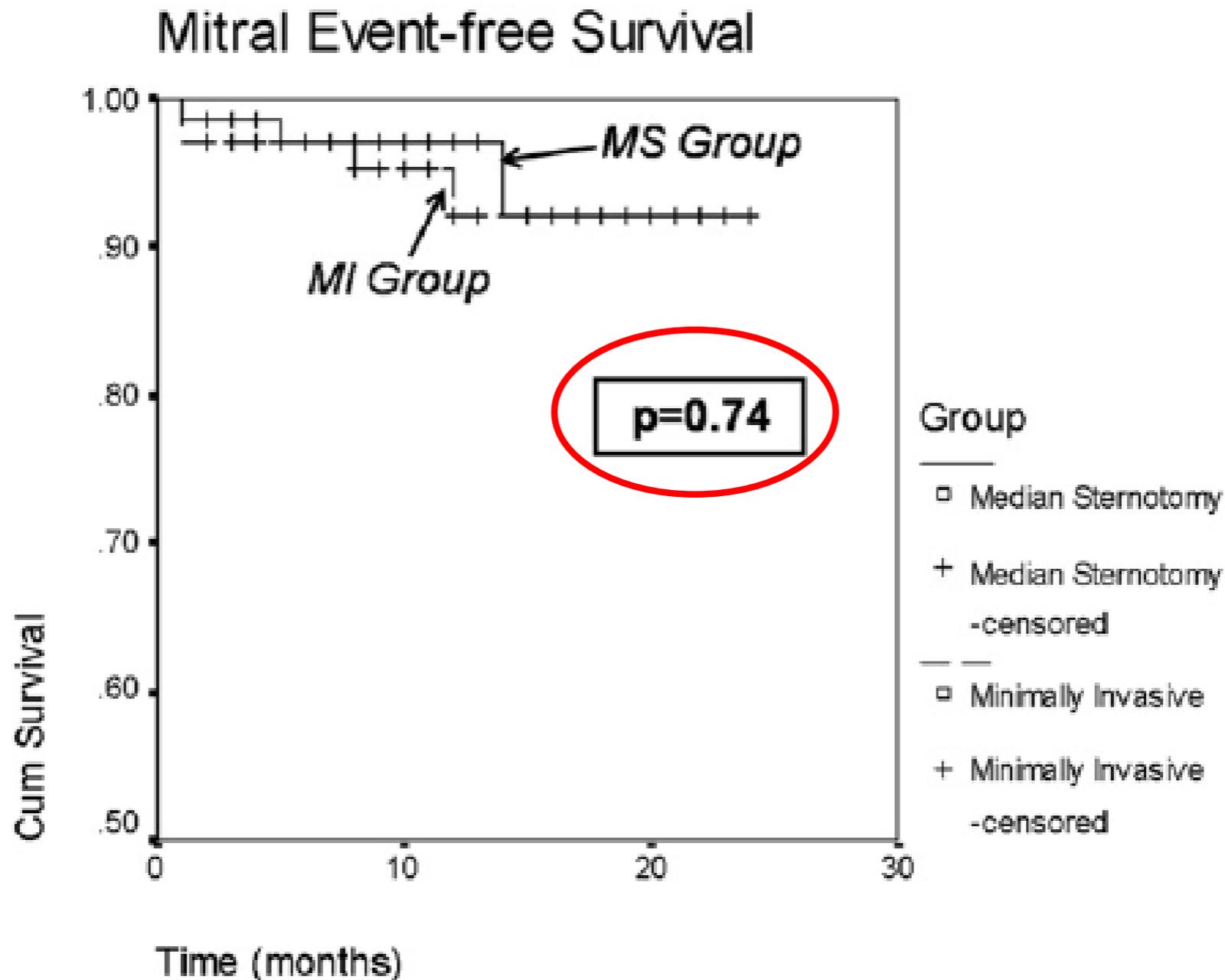
MI Group	68	67	67	67	67
MS Group	69	69	69	69	69



RESULTS

Mitral event*-free survival at Follow-up (K-M)

*Mitral event: recurrent moderate to severe mitral regurgitation; reoperation on the mitral valve



Patients at risk:

MI Group	68	67	66	66	66
MS Group	69	68	67	67	67



Conclusions

- ⑩ The minimally invasive technique is similar to the conventional surgery concerning the feasibility profile.
- ⑩ The follow-up results, in terms of recurrent mitral regurgitation, reoperation on the mitral valve and mitral event-free survival, are also comparable among the groups.
- ⑩ Reduced earlier extubation and discharge from ICU, postoperative pain and facilitated recovery are nonetheless evident in patients receiving the minimally invasive surgery.
- ⑩ Earlier surgical referral of mitral valvular disease amenable to repair is encouraged by these data, since state-of-the-art results of mitral repair can be achieved at the price of a reduced operative morbidity and shorter postoperative course if the minimally invasive technique is adopted.



THANKS!!!



GRUPPO VILLA MARIA