EUROVALVE

CROWNE PLAZA LINATE

MILAN

SEPTEMBER 21&22,2023

COURSE DIRECTORS

Patrizio Lancellotti, Belgium
Khalil Fattouch, Italy
Gilbert Habib, France
José Luis Zamorano, Spain
Philippe Pibarot, Canada
Mani Vannan, USA
Jeroen Bax, The Netherlands

LOCAL HOST

Eustachio Agricola, Italy

ECS CLUB

Totally Endoscopic Aortic Valve Replacement: the key for the future?

Mattia Glauber, MD

IRCCS Galeazzi – Sant'Ambrogio Hospital, Milan (Italy)

DISCLOSURE

I have no financial relationships to disclose

THE IDEAL PROCEDURE

- Safe
- Minimally Invasive
- Rapid recovery and good QoL
- Long-term result
- Cost - effective

HISTORICAL BACKGROUND

-1896 First successful cardiac operation in Frankfurt by Rehn

Patient appears moribund..... I decided to operate entering the chest via the left 4° intercostal space....
I used a small intestinal needle and silk suture to suture the heart wound and bleeding was controlled....
I hope this will lead to more investigation regarding surgery of the heart. This may save many lives.

-1912 First successful surgical aortic valvuloplasty by Tuffier

He dilateD the valve supposedly by pushing the invaginated aortic wall through the stenotic valve
The 26-year-old patient recovered and returned to his home in Belgium

- 1960 First successful aortic valve replacement by Harken

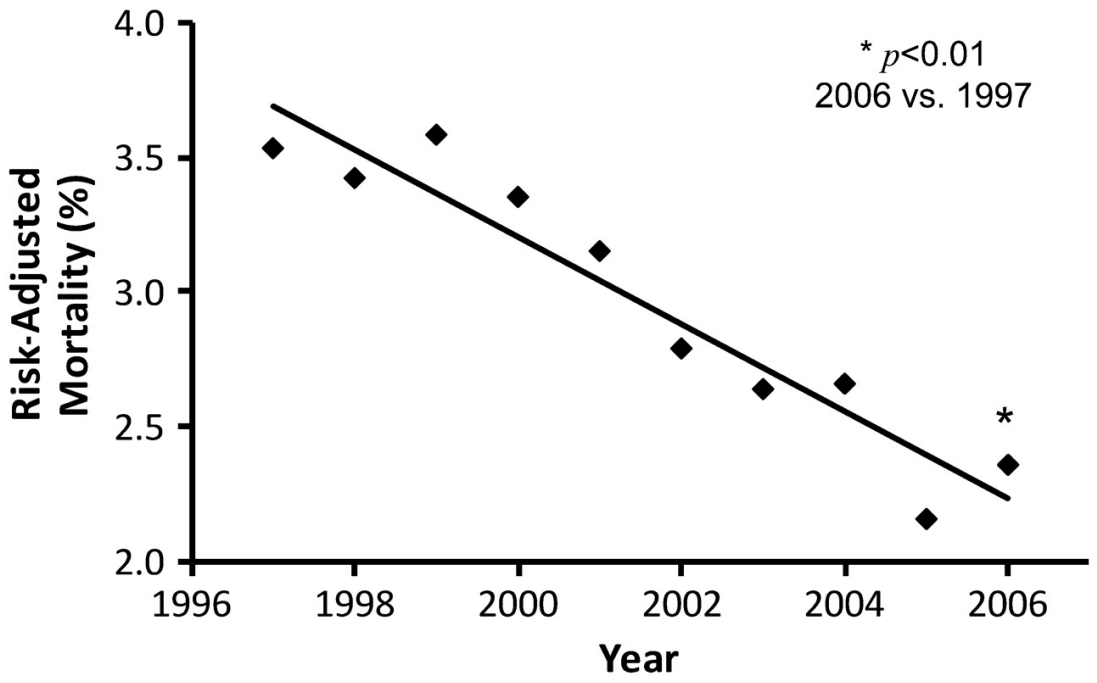
Caged- ball in sub-coronary position

- 1996 First Minimally Invasive AVR

KEY POINTS

- Mortality reduction
- Invasiveness surgical procedure
- Safety and quality Standard AVR

Risk-adjusted mortality for AVR during 10 years in the STS database



Brown J. M. et al.; J Thorac Cardiovasc Surg 2009;137:82-90 Schitto JD et al JACC 2010;56:455-62

RATIONALE OF MICS

- Improves postoperative respiratory function
- Reduces postoperative pain and recovery
- Provides a cosmetically superior incision
- Reduce dissection of other areas (low blood loss)
- Facilitates REDO , as the lower part of the pericardium remains closed
- More rapid return to functional activity, less rehabilitation resources
- Beneficial effects in elderly
- Reduces Costs

Keynote Lecture Series

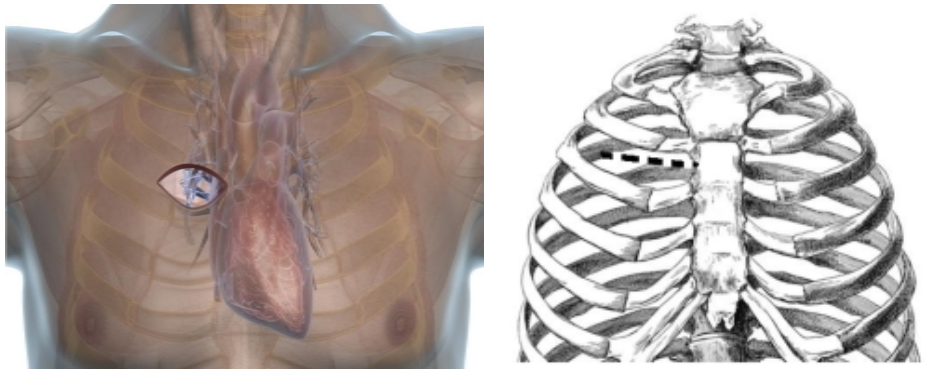
Minimally invasive aortic valve surgery: state of the art and future directions

Mattia Glauber, Matteo Ferrarini, Antonio Miceli

Cardiac Surgery and Great Vessels Department, Istituto Clinico Sant'Ambrogio, Gruppo Ospedaliero San Donato, Milan, Italy

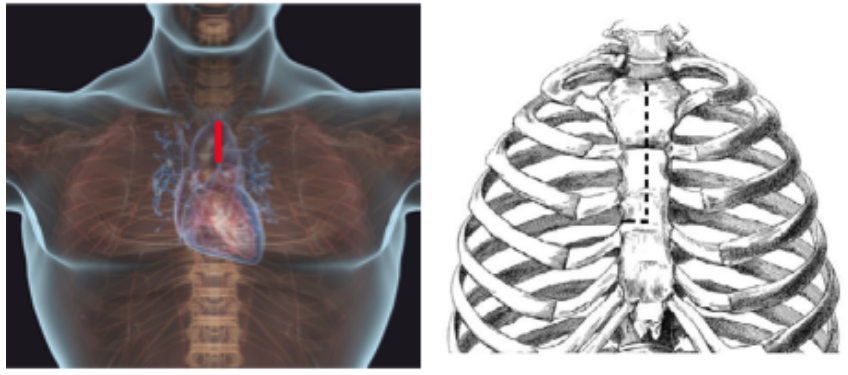
Correspondence to: Antonio Miceli, MD, PhD. Cardiac Surgery and Great Vessels Department, Istituto Clinico Sant'Ambrogio, Gruppo Ospedaliero San Donato, Via Favarelli 16, 20149 Milano, Italy. Email: antoniomiceli79@alice.it.

RIGHT ANTERIOR MINITHORACOTOMY



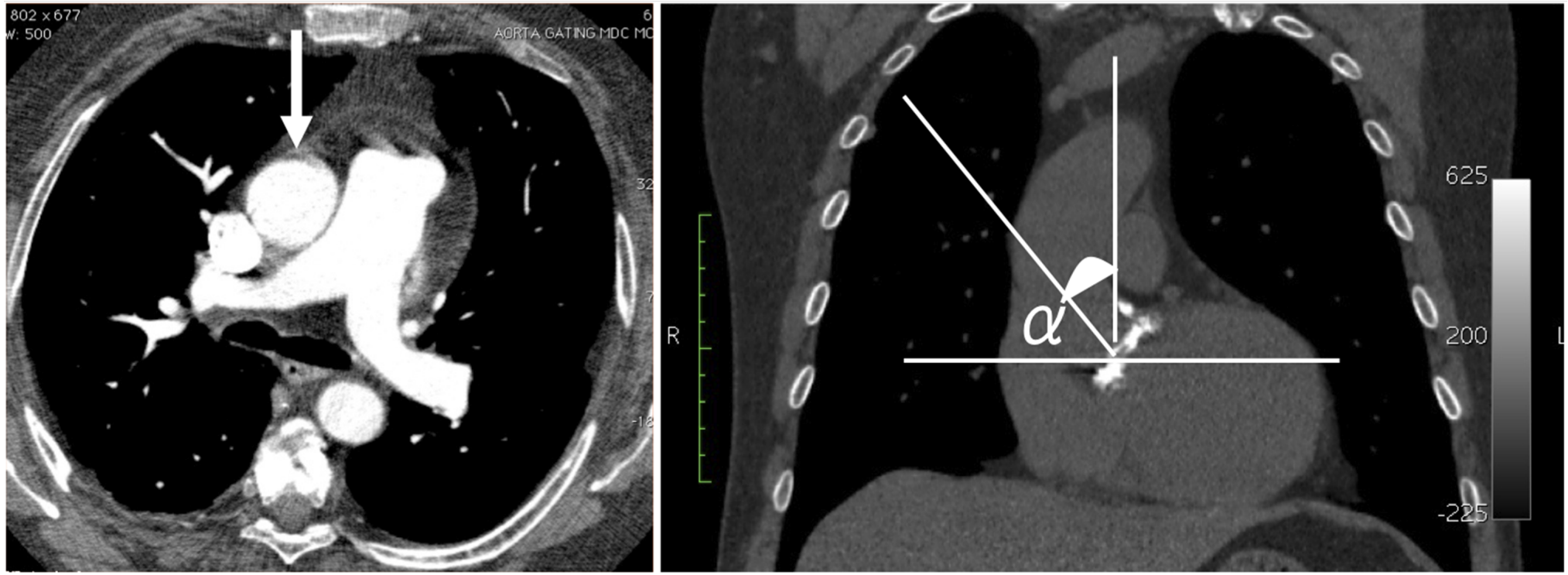
2ND INTERCOSTAL SPACE (90%)

MINISTERNOTOMY



3RD INTERCOSTAL SPACE

RT EVALUATION



A. B.

1. Aorta is rightward
2. The distance from ascending aorta to sternum < 10 cm
3. Angle α ≥45

Minimally invasive aortic valve replacement using right minithoracotomy is associated with better outcomes than ministernotomy

Antonio Miceli, MD, PhD, Michele Murzi, MD, Danyiar Gilmanov, MD, Raffaele Fugà, MD, Matteo Ferrarini, MD, Marco Solinas, MD, and Mattia Glauber, MD

Objective: To compare the outcomes of right minithoracotomy (RT) versus ministernotomy (MS) in patients undergoing minimally invasive aortic valve replacement (AVR).

Methods: From January 2005 to December 2011, 406 patients underwent minimally invasive AVR, of whom 251 patients were in the RT group and 155 were in the MS group.

Results: The overall in-hospital mortality was 1.2% with no difference between the 2 groups (1.2% in RT vs 1.3% in MS). Patients undergoing minimally invasive AVR using RT had a lower incidence of postoperative atrial fibrillation (19.5% vs 34.2%, $P = .01$), shorter ventilation time (median, 7 vs 8 hours; interquartile range, 5-9 vs 6-12 hours, $P = .003$), intensive care unit stay (median 1 vs 1 day; interquartile range, 1-1 vs 1-2 days; $P = .001$), and hospital stay (median, 5 vs 6 days; interquartile range, 5-6 vs 5-8 days; $P = .0001$). No difference was found in terms of cardiopulmonary time, crossclamping time, postoperative stroke, re-exploration for bleeding, or blood transfusion.

Conclusions: Minimally invasive AVR using RT was associated with lower postoperative morbidities and a shorter hospital stay than MS. (J Thorac Cardiovasc Surg 2014;148:133-7)

ACD

406 enrolled – 251 RT vs 155 Mini - ST

- Mortality: 1.2 % vs 1.3 %
- RT showed:
  - lower AF
  - Shorter Ventilation, ICU & LOS
- Stroke, Bleeding, Blood transfusion, CPB & XCT were similar

MIAVR via RT was associated with lower postoperative morbidities and shorter hospital stay

Minimal Access Aortic Valve Replacement: Is It Worth It?

Bari Murtuza, PhD, FRCS, John R. Pepper, FRCS, Rex DeL Stanbridge, FRCS, Catherine Jones, BSc, MBBS, Christopher Rao, MBBS, Ara Darzi, KBE, FRCS, and Thanos Athanasiou, PhD, FETCS

Departments of Cardiothoracic Surgery and Surgical Oncology and Technology, St. Mary's Hospital, Faculty of Medicine, Imperial College, and Department of Cardiothoracic Surgery, Royal Brompton Hospital, Faculty of Medicine, Imperial College, London, England

Controversy surrounds the use of minimal access aortic valve replacement (AVR). This meta-analytical study quantified the effects of minimal access AVR on morbidity and mortality compared with conventional AVR and evaluated study heterogeneity and robustness of the findings using sensitivity analysis. Overall, meta-analysis suggested marginal benefits in perioperative mortality (4,667 patients; odds ratio, 0.72; 95% confidence interval, 0.51-1.00; $p = 0.05$), intensive care unit stay, total hospital stay, and ventilation time in the minimal access AVR group, although cross-clamp, cardiopulmonary bypass, and total operation times were longer. Study heterogeneity and apparent benefits in perioperative mortality were related to study quality, athough results for intensive care unit and hospital stay were maintained according to the sensitivity analysis. This suggests that minimal access AVR can be offered on the basis of patient choice and cosmesis rather than evident clinical benefit.

(Ann Thorac Surg 2008;85:1121–31)

Operative times

⬆ CPB time

⬆ X-clamp time

⬆⬆⬆⬆
⬆⬆⬆

Murtuza B. et al.; Ann Thorac Surg 2008;85:1121-1131

THE IDEAL PROSTHESIS

- Easy to implant
- Excellent hemodynamic performance
- No intrinsic thrombogenicity
- Long-term durability
- Low risk of endocarditis

European Journal of Cardio-Thoracic Surgery 49 (2016) 709–718
doi:10.1093/ejcts/ezv369 Advance Access publication 29 October 2015

REPORT

Cite this article as: Gersak B, Fischlein T, Folliguet TA, Meuris B, Teoh KHT, Moten SC *et al*. Sutureless, rapid deployment valves and stented bioprosthesis in aortic valve replacement: recommendations of an International Expert Consensus Panel. Eur J Cardiothorac Surg 2016;49:709–18.

Sutureless, rapid deployment valves and stented bioprosthesis in aortic valve replacement: recommendations of an International Expert Consensus Panel

Borut Gersak[a,*], Theodor Fischlein[b], Thierry A. Folliguet[c], Bart Meuris[d], Kevin H.T. Teoh[e], Simon C. Moten[f], Marco Solinas[g], Antonio Miceli[h], Peter J. Oberwalder[i], Manfredo Rambaldini[j], Gopal Bhatnagar[k], Michael A. Borger[l], Denis Bouchard[m], Olivier Bouchot[n], Stephen C. Clark[o], Otto E. Dapunt[i], Matteo Ferrarini[p], Guenther Laufer[q], Carmelo Mignosa[r], Russell Millner[s], Philippe Noirhomme[t], Steffen Pfeiffer[b], Xavier Ruyra-Baliarda[u], Malakh Shrestha[v], Rakesh M. Suri[w], Giovanni Troise[x], Anno Diegeler[y], Francois Laborde[z], Marc Laskar[aa], Hani K. Najm[ab] and Mattia Glauber[p]

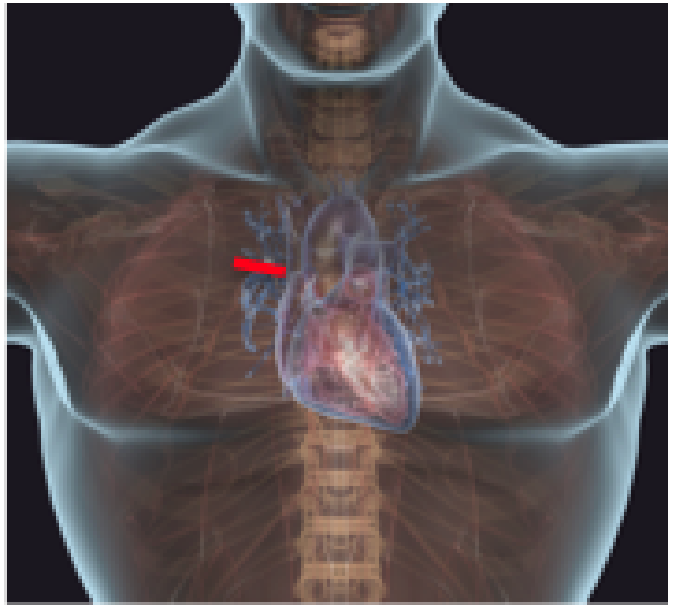
A.

B.

C.

Minimally invasive aortic valve replacement with Perceval S sutureless valve: Early outcomes and one-year survival from two European centers

Antonio Miceli, MD, PhD,[a,b] Giuseppe Santarpino, MD,[c] Steffen Pfeiffer, MD,[c] Michele Murzi, MD,[a] Daniyar Gilmanov, MD,[a] Giovanni Concistré, MD,[c] Eugenio Quaini, MD,[a] Marco Solinas, MD,[a] Theodor Fischlein, MD,[c] and Mattia Glauber, MD[a]



CPB	**- 40%**	**- 35%**
Xclamp	**- 38 %**	**- 43%**

Right anterior minithoracotomy for aortic valve replacement: 10-year experience of a single center

Mattia Glauber, MD, Daniyar Gilmanov, MD, Pier Andrea Farneti, MD, Enkel Kallushi, MD, Antonio Miceli, MD, Francesca Chiaramonti, MD, Michele Murzi, MD, and Marco Solinas, MD

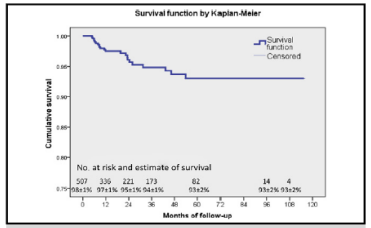
ABSTRACT

Objective: Minimally invasive aortic valve replacement (AVR) has been associated with several better outcomes over the standard full sternotomy approach. We revised our 10-year experience with right anterior minithoracotomy (RAMT) for AVR.

Methods: Between 2004 and 2014, a total of 593 patients (310 men; median age: 73.8 years) underwent AVR via RAMT. Preoperatively, a mixed valve lesion was diagnosed in 55 (9.3%) patients; and pure aortic regurgitation in 86 (14.5%). Mean logistic EuroSCORE I (European system for cardiac operative risk evaluation) was 7.4 (median: 5.76).

Results: In 302 (50.9%) patients, a sutureless or rapidly implantable biological prosthesis was used; in 23 (3.9%), a mechanical prosthesis; and in the remainder, a conventional biological prosthesis. A total of 113 (19.1%) patients had a small aortic annulus (≤21 mm). Operative times averaged 80 (median: 74) minutes of crossclamping time, and 117 (107) minutes of perfusion time; these were significantly shorter with a sutureless prostheses, compared with a sutured prostheses: perfusion 99 versus 134 minutes, $P < .0005$; aortic crossclamping time: 64 versus 97 minutes, $P < .0005$. The mean (median) assisted ventilation time was 9.8 (6) hours; intensive care unit stay was 1.5 (1) days; hospital length of stay was 6.6 (6) days. Overall in-hospital mortality was 9 deaths (1.5%). At 31.5 months mean follow-up time (1531 cumulative patient-years), 94.8% survival was observed.

Conclusions: Minimally invasive AVR is a safe procedure, with low perioperative morbidity, and low rates of reoperation and death at late follow-up. Excellent outcomes can be achieved with minimally invasive AVR via right anterior minithoracotomy. Sutureless prostheses facilitate minimally invasive AVR and are associated with reduced operative times. (J Thorac Cardiovasc Surg 2015;150:548-56)



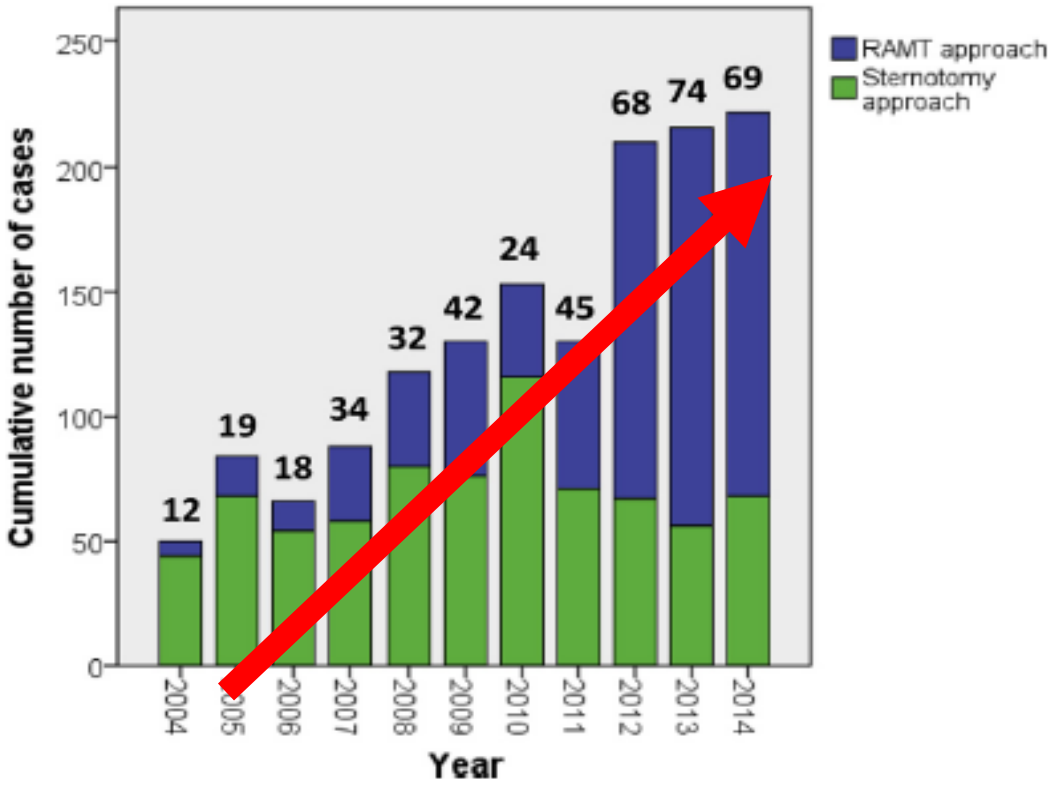
Overall survival curve by Kaplan-Meier test for general cohort (593 patients).

Central Message

Aortic valve replacement through right anterior minithoracotomy provides excellent outcomes. Sutureless prostheses facilitate mini aortic valve replacement.

Perspective

Many patients with aortic valve disease still undergo conventional AVR or are directed to alternative treatment with transcatheter AVR. Mini-AVR, through RAMT, provides excellent short-term outcomes, with low mortality and perioperative morbidity, and comparable long-term survival. More surgeons should enrich their armamentarium by adding RAMT AVR. Sutureless prostheses can increase adoption of RAMT AVR.



ACD

SYSTEMATIC REVIEW AND META-ANALYSIS

American Heart Association | American Stroke Association

Sutureless Perceval Aortic Valve Versus Conventional Stented Bioprostheses: Meta-Analysis of Postoperative and Midterm Results in Isolated Aortic Valve Replacement

Massimo Meco, MD;* Andrea Montisci, MD;* Antonio Miceli, MD, PhD; Paolo Panisi, MD; Francesco Donatelli, MD; Silvia Cirri, MD; Matteo Ferrarini, MD; Antonio Lio, MD; Mattia Glauber, MD

8 comparative studies

575 Sutureless
(SU group)

681 Stented valved
(AVR Group)

Conclusions—The Perceval bioprosthesis improves the postoperative course compared with conventional bioprostheses and is an option for high-risk patients. (***J Am Heart Assoc.*** **2018;7:e006091. DOI: 10.1161/JAHA.117.006091.)**

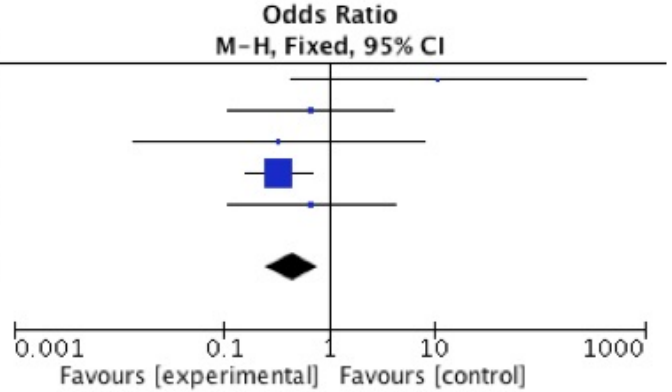
	Group P	Group C	OR/WMD (CI 95%)	p
CPB time (min)	67.4+20.2	93.2+25.8	-25.28(-32.0/-18.4)	0,001*
ACC time (min)	39.6+14.2	66+17.4	-26.26(-30/-22.48)	0,001*
Ventilation time (hours)	7.6±2.3	11±7.5	-1.05(-1.43/0.67)	0.001*
Blood transfusions	1.16+1.2	2.13+2.2	0.99 (-1.22/-0.75)	0,001*
Units of transfused RBC	3.5±3.8	6.4±6.7	-0.99(-1.22/-0.75	0.001*

ACUTE KIDNEY INJURY

B

Study or Subgroup	Perceval Events	Total	Conventional Events	Total	Weight	Odds Ratio M-H, Fixed, 95% CI
D'onofrio 2012	1	31	0	112	0.6%	11.07 [0.44, 278.48]
Dalen 2015	2	171	3	171	8.3%	0.66 [0.11, 4.02]
Gilmanov 2014	0	133	1	133	4.2%	0.33 [0.01, 8.19]
muneretto 2015	11	204	30	204	79.1%	0.33 [0.16, 0.68]
Santarpino 2013	2	49	3	50	7.9%	0.67 [0.11, 4.17]
Total (95% CI)		**588**		**670**	**100.0%**	**0.45 [0.25, 0.80]**
Total events	16		37			

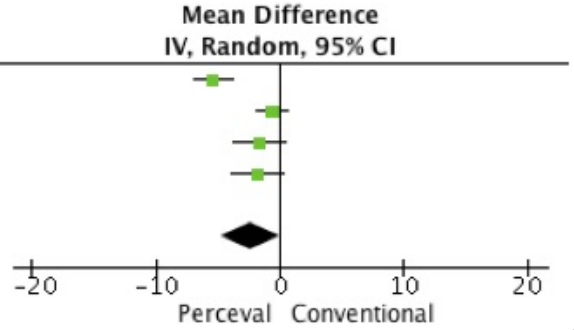
Heterogeneity: $Chi^2 = 4.88$, df = 4 (P = 0.30); $I^2 = 18\%$
Test for overall effect: Z = 2.69 (P = 0.007)



C HEMODYNAMIC PERFORMANCE

Study or Subgroup	Perceval Mean	Perceval SD	Perceval Total	Conventional Mean	Conventional SD	Conventional Total	Weight	Mean Difference IV, Random, 95% CI
D'onofrio 2012	11.1	3.4	31	16.5	5.8	112	25.7%	-5.40 [-7.01, -3.79]
muneretto 2015	10.8	6.8	204	11.4	6	204	27.1%	-0.60 [-1.84, 0.64]
Santarpino 2013	8.4	6	50	10	4.9	50	23.5%	-1.60 [-3.75, 0.55]
Shrestha 2013	13.6	5.4	50	15.4	6.3	70	23.7%	-1.80 [-3.90, 0.30]
Total (95% CI)			**335**			**436**	**100.0%**	**-2.35 [-4.69, -0.02]**

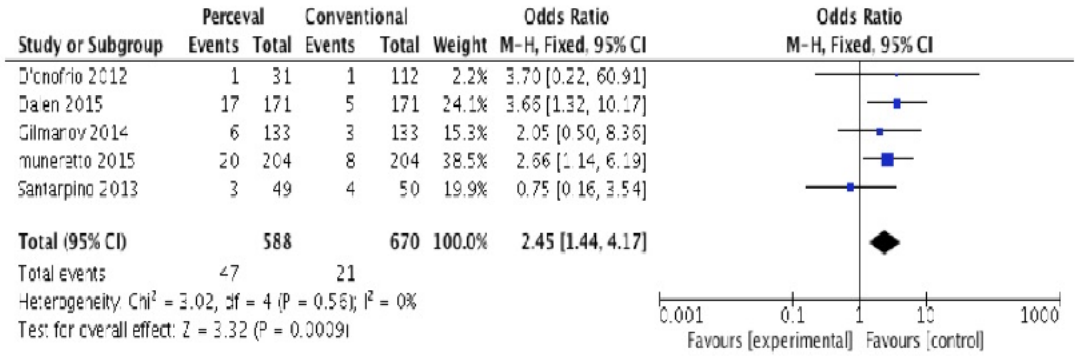
Heterogeneity: $Tau^2 = 4.82$; $Chi^2 = 22.00$, df = 3 ($P < 0.0001$); $I^2 = 86\%$
Test for overall effect: Z = 1.98 (P = 0.05)



	Group P	Group C	OR/WMD (CI 95%)	p
Prosthesis size (mm)	**23.42+1.73**	**22.8+1.86**	**0.90(0.62/1.18)**	**0,001***
Mean gradient (mmHg)	**10.98+5.7**	**13.06+6.2**	**-2.08(-3.96/-0.21)**	**0,030***

Better hemodynamic performances

PACEMAKER IMPLANTATION



Study or Subgroup	Perceval Events	Perceval Total	Conventional Events	Conventional Total	Weight	Odds Ratio M-H, Fixed, 95% CI
D'onofrio 2012	1	31	1	112	2.2%	3.70 [0.22, 60.91]
Dalen 2015	17	171	5	171	24.1%	3.68 [1.32, 10.17]
Gilmanov 2014	6	133	3	133	15.3%	2.05 [0.50, 8.36]
muneretto 2015	20	204	8	204	38.5%	2.66 [1.14, 6.19]
Santarpino 2013	3	49	4	50	19.9%	0.75 [0.16, 3.54]
Total (95% CI)		**588**		**670**	**100.0%**	**2.45 [1.44, 4.17]**
Total events	47		21			

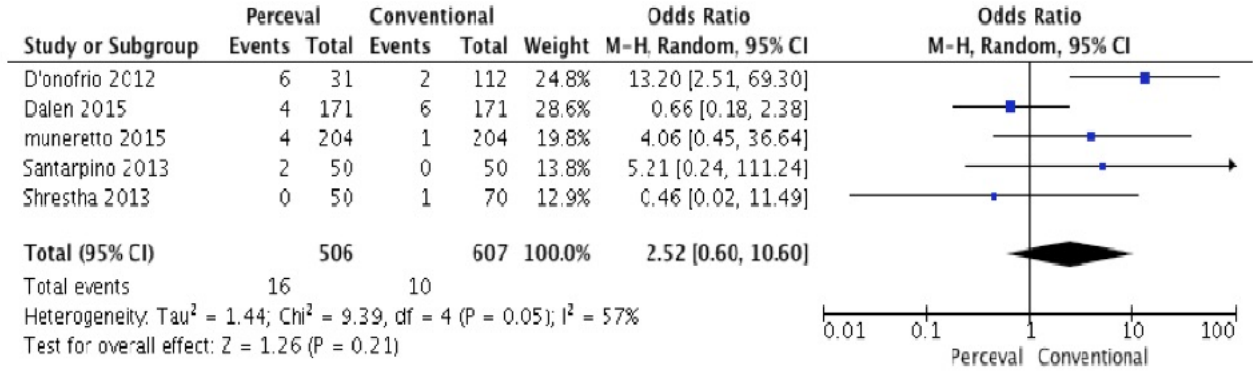
Heterogeneity: Chi² = 3.02, df = 4 (P = 0.56); I² = 0%
Test for overall effect: Z = 3.32 (P = 0.0009)

Odds Ratio M-H, Fixed, 95% CI
0.001 0.1 1 10 1000
Favours [experimental] Favours [control]

7.9 vs 3.1%

Lower PM implantation

PARAVALVULAR LEAKAGE



Study or Subgroup	Perceval Events	Perceval Total	Conventional Events	Conventional Total	Weight	Odds Ratio M-H, Random, 95% CI
D'onofrio 2012	6	31	2	112	24.8%	13.20 [2.51, 69.30]
Dalen 2015	4	171	6	171	28.6%	0.66 [0.18, 2.38]
muneretto 2015	4	204	1	204	19.8%	4.06 [0.45, 36.64]
Santarpino 2013	2	50	0	50	13.8%	5.21 [0.24, 111.24]
Shrestha 2013	0	50	1	70	12.9%	0.46 [0.02, 11.49]
Total (95% CI)		**506**		**607**	**100.0%**	**2.52 [0.60, 10.60]**
Total events	16		10			

Heterogeneity: Tau² = 1.44; Chi² = 9.39, df = 4 (P = 0.05); I² = 57%
Test for overall effect: Z = 1.26 (P = 0.21)

Odds Ratio M-H, Random, 95% CI
0.01 0.1 1 10 100
Perceval Conventional

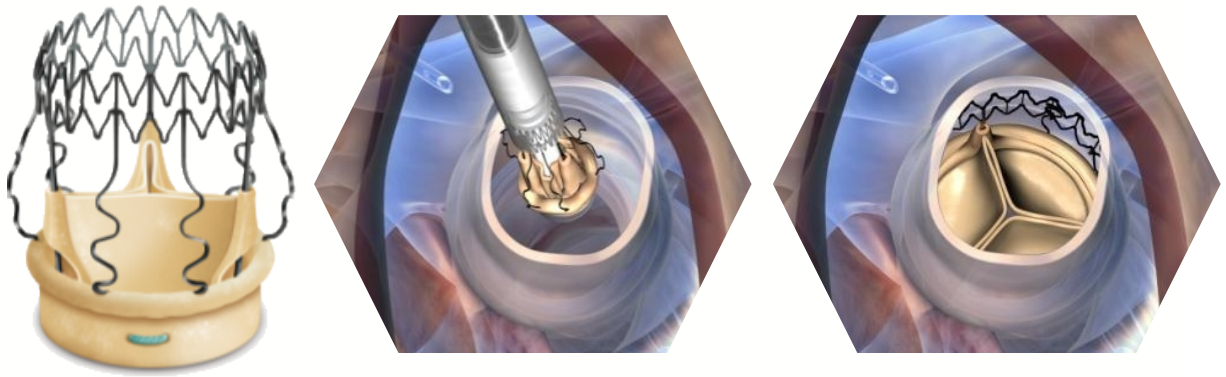
Lower PVL

3.1% vs 1.6%

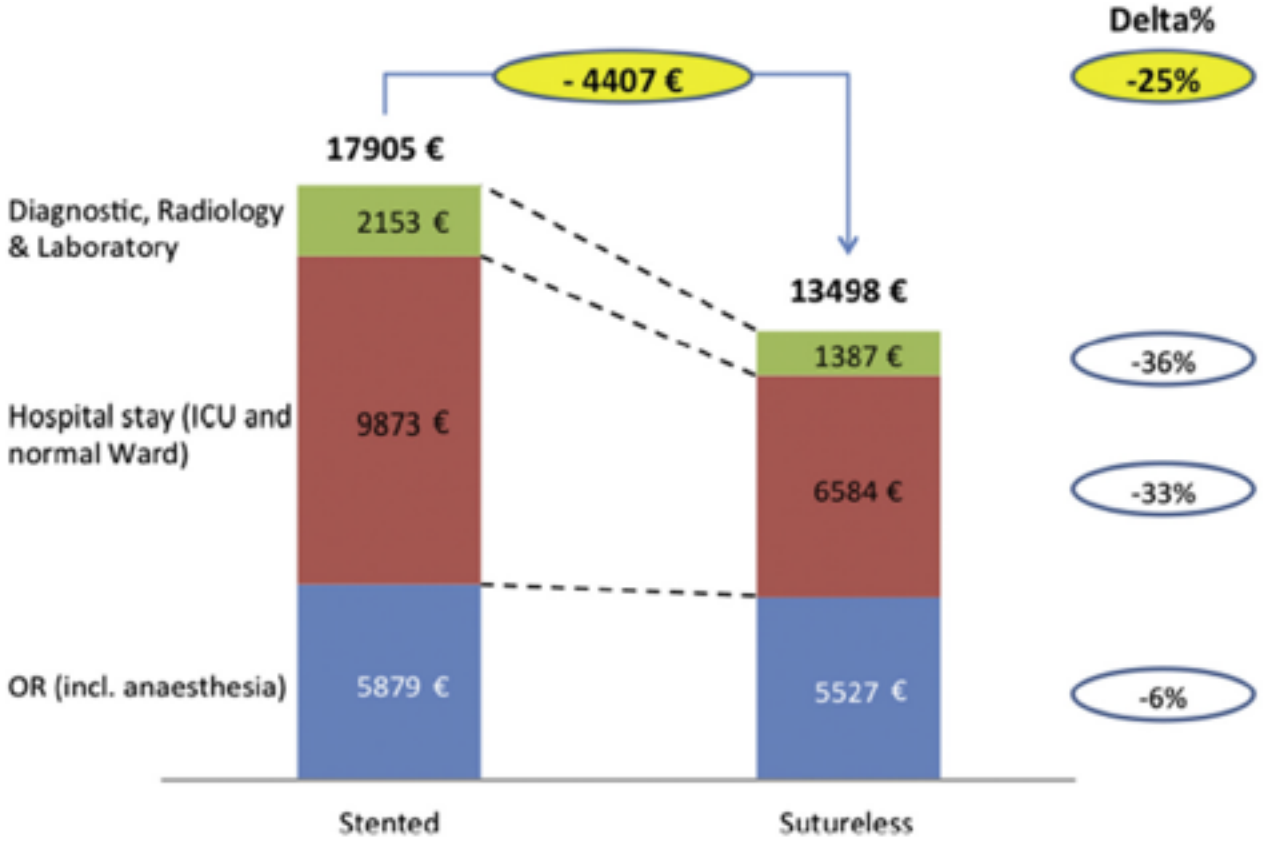
Better Short-Term Outcome by Using Sutureless Valves: A Propensity-Matched Score Analysis

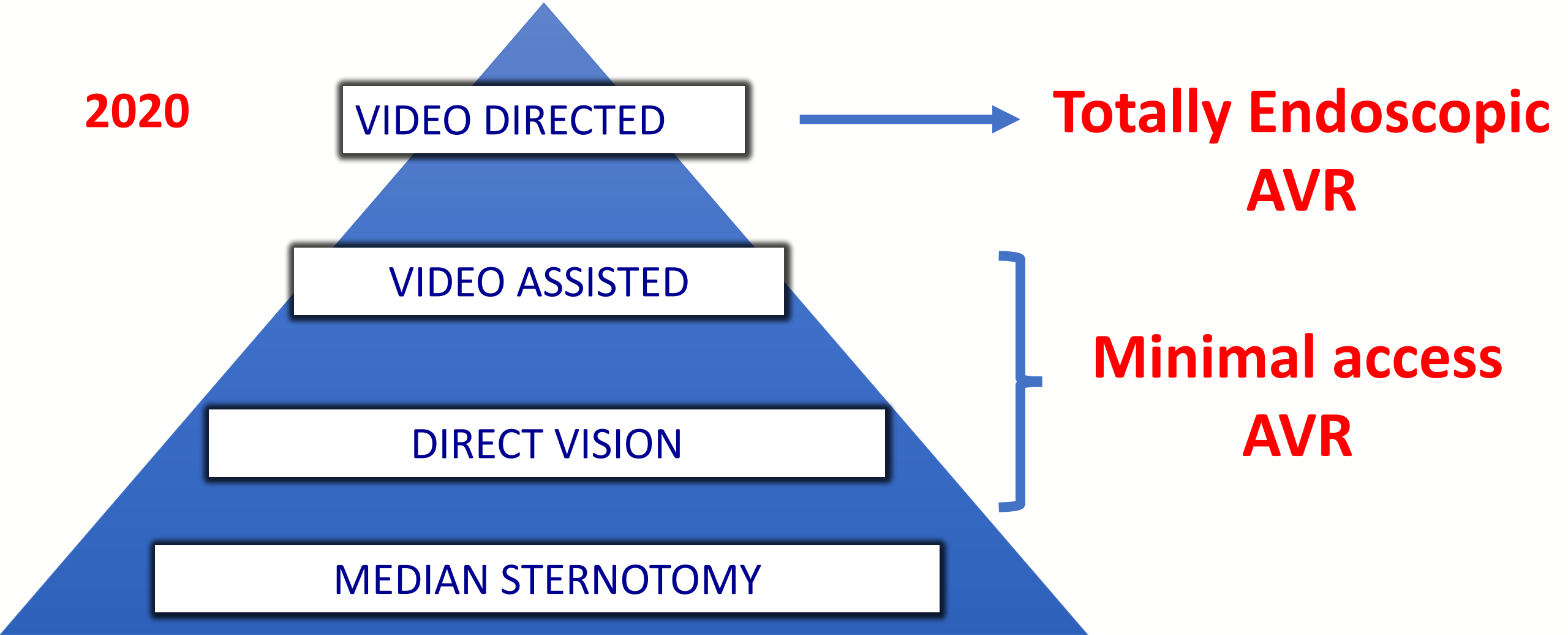
Francesco Pollari, MD,* Giuseppe Santarpino, MD,* Angelo Maria Dell'Aquila, MD, Laszlo Gazdag, MD, Husam Alnahas, MD, Ferdinand Vogt, MD, Steffen Pfeiffer, MD, and Theodor Fischlein, MD

Department of Cardiac Surgery, Klinikum Nürnberg, Paracelsus Medizinischen Privatuniversität, Nuremberg; and Department of Cardiac Surgery, Universitätsklinikum Münster, Münster, Germany



Ann Thorac Surg 2014;98:611–7




2020
VIDEO DIRECTED
VIDEO ASSISTED
DIRECT VISION
MEDIAN STERNOTOMY
Totally Endoscopic AVR
Minimal access AVR

EUROVALVE

CROWNE PLAZA LINATE
MILAN

SEPTEMBER
21&22,2023

From macro-surgery

- No Retractor
- 3D-HD (4K)
- Totally endoscopic
- CorKnot
- RAM **Sutureless**
- Root Retraction System

To endoscopic micro-surgery

EUROVALVE

CROWNE PLAZA LINATE
MILAN

SEPTEMBER
21&22,2023

European Journal of Cardio-Thoracic Surgery 2022, 62(6), ezac467
https://doi.org/10.1093/ejcts/ezac467 Advance Access publication 27 September 2022

ORIGINAL ARTICLE

Cite this article as: Yilmaz A, Van Genechten S, Claessens J, Packlé L, Maessen J, Kaya A. A totally endoscopic approach for aortic valve surgery. Eur J Cardiothorac Surg 2022; doi:10.1093/ejcts/ezac467.

A totally endoscopic approach for aortic valve surgery

Alaaddin Yilmaz [a,*,†], Silke Van Genechten [a,†], Jade Claessens [a,b], Loren Packlé [a], Jos Maessen [c] and Abdullah Kaya [a,b]

[a] Department of Cardiothoracic Surgery, Jessa Hospital, Stadsomvaart 11, 3500 Hasselt, Belgium
[b] UHasselt - Hasselt University, Faculty of Medicine and Life Sciences - LCRC, Agoralaan, 3590 Diepenbeek, Belgium
[c] Department of Cardiothoracic Surgery, Heart and Vascular Centre, Maastricht University Medical Centre, P. Debyelaan 25, 6229 HX Maastricht, The Netherlands

* Corresponding Author., Stadsomvaart 11, 3500 Hasselt/Belgium, Tel: +3211337104; e-mail: alaaddin.yilmaz@jessazh.be (A.Yilmaz).

Received 16 March 2022; received in revised form 8 June 2022; accepted 26 September 2022

Key question

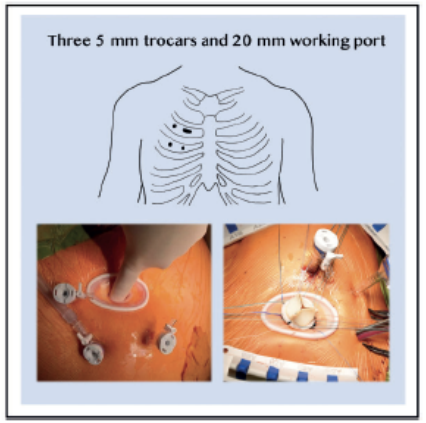
What are the outcomes of a new totally endoscopic technique for aortic valve surgery?

Key finding(s)

The hospital mortality was 1.50%. Major adverse cardiac and cerebral events occurred in five patients within 30 days.

Take-home message

Our experience with totally endoscopic aortic valve replacement demonstrated satisfactory results, with low mortality and morbidity rates.



Perspective

Total endoscopic sutureless aortic valve replacement: ratio development, perspectives

Marco Vola[1], Jean-Francois Fuzellier[1], Salvatore Campisi[1], Daniel Grinberg[1], Jean-Noël Jerôme Morel[2], Antoine Gerbay[1]

[1]Cardiovascular Diseases Department, [2]Anesthesiolgy and Reanimation Department, University of St-Etienne, St-Etienne, France
Correspondence to: Marco Vola, MD, PhD. Cardiovascular Surgery Unit, St-Etienne University Hospital, 42055 France. Email: marco.vola@un

Transcatheter valve implantation is progressively becoming the first line option for high risk patients in the management of severe aortic valve stenosis. Surgery is likely to remain the gold standard treatment option for intermediate risk patients since it ensures ablation of the underlying pathology and the calcified aortic valvular tissue, which potentially can act as a nidus of chronic embolization and provoke neurocognitive dysfunction in this subset of active patients. The surgical approach is continually evolving, with sutureless technology having the potential to facilitate ministernotomy and minithoracotomy approaches. Furthermore, Nitinol stented models can be introduced through thoracoscopic trocars, enabling the evolution of totally endoscopic aortic valve replacement (TEAVR). We present herein the development of TEAVR, starting from the cadaver experience in our lab. We transitioned through a clinical minithoracotomy video-assisted experience until we finally could initiate a program of human sutureless TEAVR. The limitations of this approach, which is still in refinement, and possible innovative solutions in order to build up a quick and reproducible procedure are discussed.

Keywords: Aortic valve stenosis; minimally invasive surgery; endoscopic surgery; transcatheter aortic valve implantation (TAVI); totally endoscopic aortic valve replacement (TEAVR)

frontiers | Frontiers in Cardiovascular Medicine

TYPE Methods
PUBLISHED 09 January 2023
DOI 10.3389/fcvm.2022.1106845

Check for updates

OPEN ACCESS

EDITED BY
Morgan Salmon,
University of Michigan, United States

REVIEWED BY
Antonino S. Rubino,
University of Campania Luigi Vanvitelli, Italy
Andrea Colli,
University of Pisa, Italy

*CORRESPONDENCE
Huiming Guo
guohuiming@gdph.org.cn
Huanlei Huang
hhuanlei@hotmail.com

†These authors have contributed equally to this work and share first authorship

SPECIALTY SECTION
This article was submitted to Aortic Surgery and Endovascular Repair, a section of the journal Frontiers in Cardiovascular Medicine

RECEIVED 24 November 2022
ACCEPTED 19 December 2022
PUBLISHED 09 January 2023

CITATION
Gu W, Zhou K, Wang Z, Zang X, Guo H, Gao Q, Tang Y, Liu J, He B, Guo H and Huang H (2023) Totally endoscopic aortic valve replacement: Techniques and early results. Front. Cardiovasc. Med. 9:1106845. doi: 10.3389/fcvm.2022.1106845

Totally endoscopic aortic valve replacement: Techniques and early results

Wenda Gu[1†], Kan Zhou[2†], Zhenzhong Wang[1†], Xin Zang[1], Haijiang Guo[1], Qiang Gao[1], Yun Teng[1], Jian Liu[1], Biaochuan He[1], Huiming Guo[1*] and Huanlei Huang[1,2*]

[1]Department of Cardiac Surgery, Guangdong Cardiovascular Institute, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences, Guangzhou, China, [2]The Second School of Clinical Medicine, Southern Medical University, Guangzhou, China

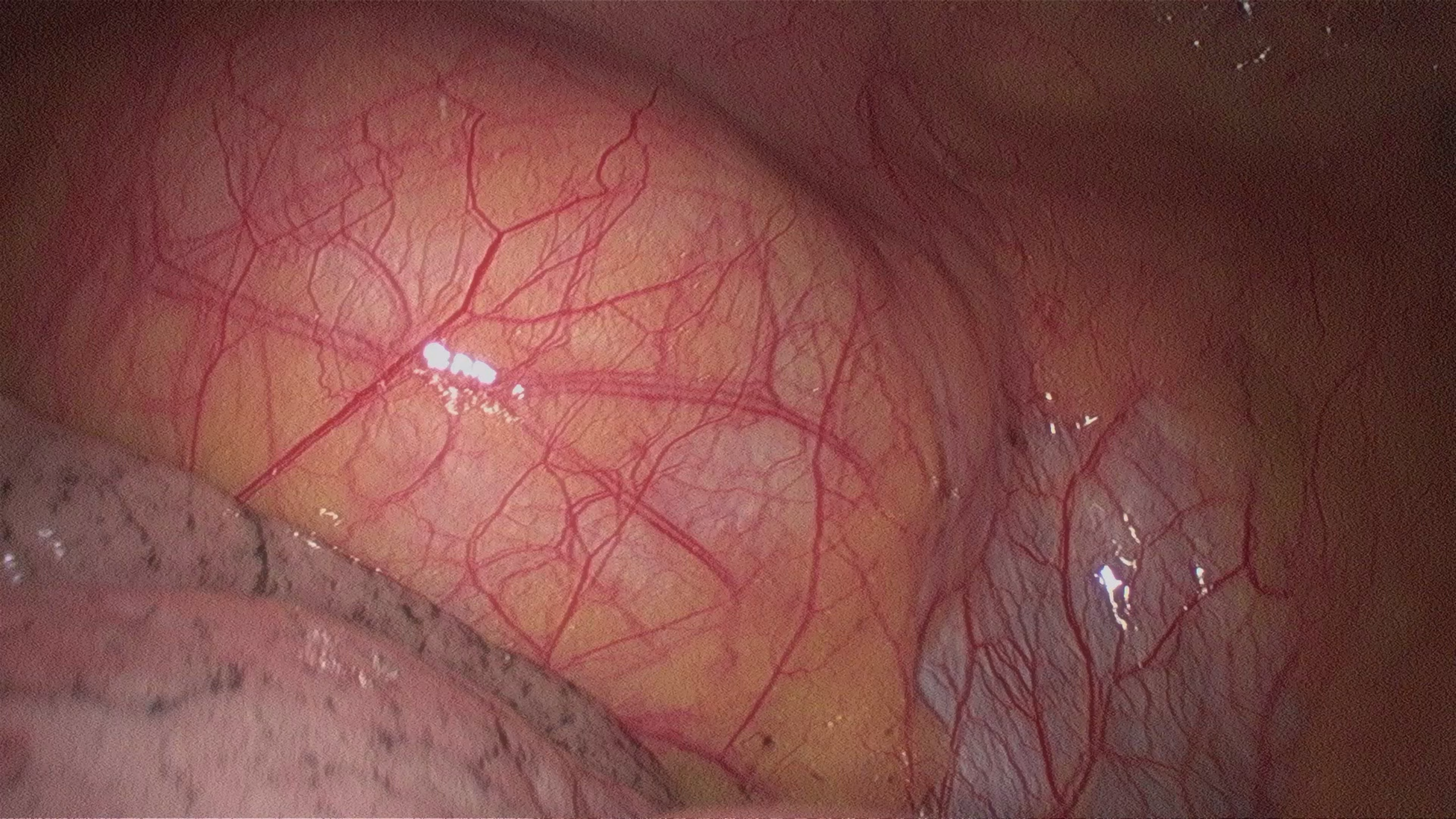
Objective: To demonstrate the technical details of total endoscopic aortic valve replacement using a standard prosthesis, compare the clinical effect and safety of endoscopic aortic valve replacement and traditional aortic valve replacement.

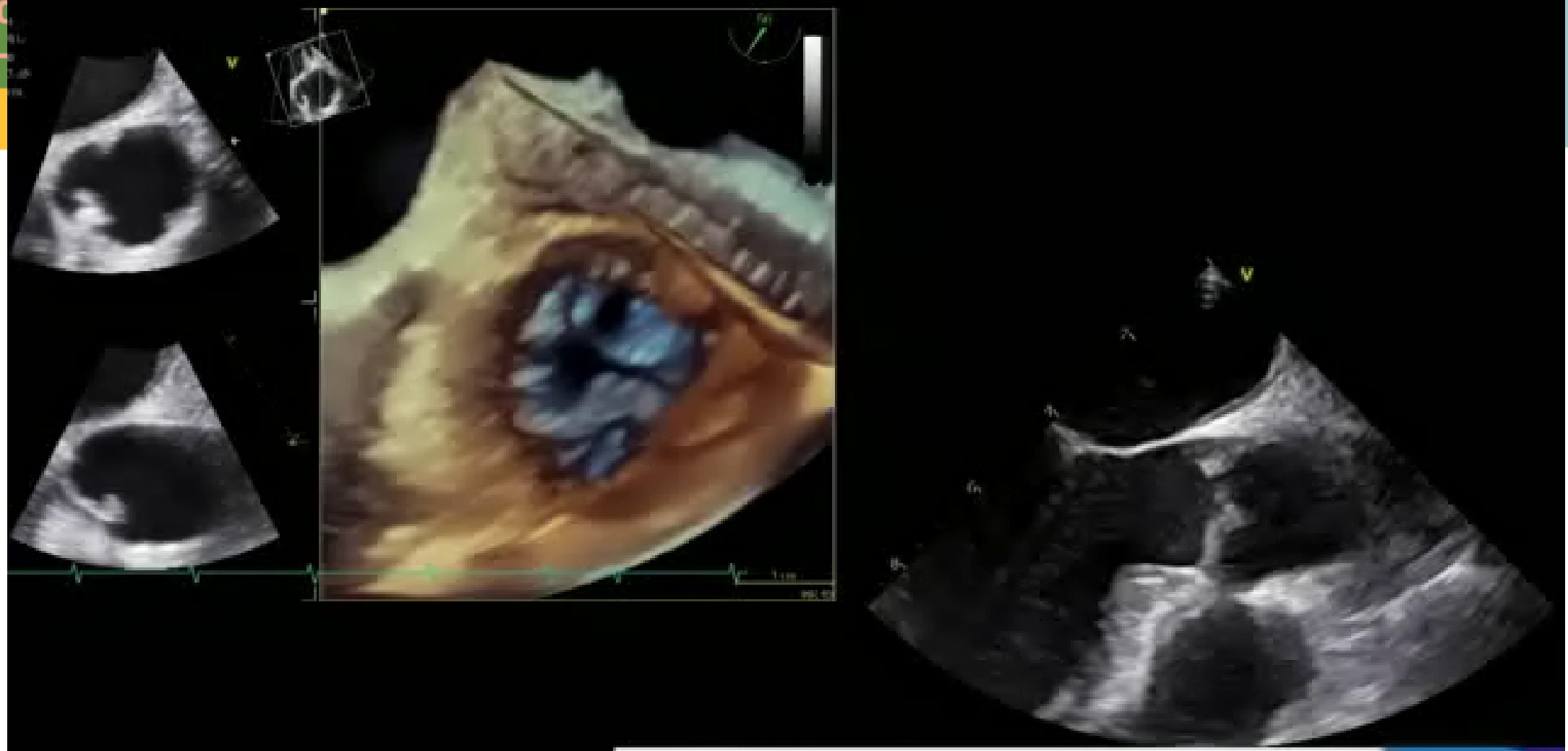
Methods: From 2020 to 2021, 60 consecutive patients underwent elective isolated aortic valve replacement (AVR). They were divided into two groups: the total endoscopic AVR group (TE-AVR group, 29 patients, nine women, aged 51.65 ± 11.79 years), and the traditional full-sternotomy group (AVR group, 31 patients, 13 women, aged 54.23 ± 12.06 years). Three working ports were adopted in the TE-AVR procedure.

Results: No patient died in either group. The cardiopulmonary bypass (CPB) time and aortic cross-clamp (ACC) time in the TE-AVR group were longer than those in the AVR group (CPB time: 177.6 ± 43.2 vs. 112.1 ± 18.1 min, $p < 0.001$; ACC time: 118.3 ± 29.7 vs. 67.0 ± 13.2 min, $p < 0.001$). However, the mechanical ventilation duration (14.2 ± 9.3 vs. 24.0 ± 18.9 h, $p = 0.015$) and postoperative hospital stay (6.0 ± 1.7 vs. 8.0 ± 4.5 days, $p = 0.025$) were shorter in patients of TE-AVR group than those of AVR group. Although the ICU stay (55.1 ± 26.9 vs. 61.5 ± 44.8 h, $p = 0.509$) and post-operative chest drainage of the first 24 h (229.8 ± 125.0 vs. 273.2 ± 103.2 ml, $p = 0.146$) revealed no statistical difference, there was a decreasing trend in the TE-AVR group. Among the patients of the TE-AVR group, two patients were converted to thoracotomy because of mild to moderate paravalvular leakage identified by intraoperative transesophageal echocardiography.

Conclusion: Total endoscopic aortic valve replacement is safe and feasible, with less trauma and quicker recovery.

KEYWORDS
total endoscopic, minimally invasive, aortic valve replacement, standard prosthesis, endoscopic cardiac surgery





Transesophageal Echocardiogram

- **Safe and feasible approach for a wide spectrum of cardiac diseases**
- **Should be a standard approach**
- **Provides excellent results**
- **It requires new skills and familiarity with newer instruments**

ECS CLUB
ENDOSCOPIC
CARDIAC SURGEONS

The Endoscopic Cardiac Surgeons Club is happy to announce
the NEXT ANNUAL MEETING

Following "The Edge of Tomorrow"

Milan (Italy) - November 16th-18th, 2023

Galeazzi - Sant'Ambrogio Hospital

SCAN ME

SAVE THE DATE!