

*Είναι η βελτίωση της ωφέλιμης επιφάνειας
το μεγαλύτερο όφελος μετά από την
αντικατάσταση της αορτικής βαλβίδος;*

Π. Δεδεηλίας

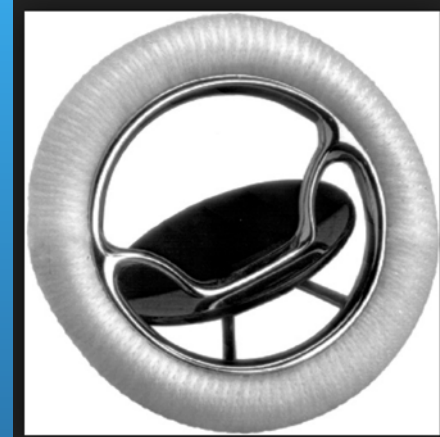


ΕΠΙΔΗΜΙΟΛΟΓΙΚΑ ΔΕΔΟΜΕΝΑ

- ΕΥΡΩΠΗ: 520 εκ.(-RUS,TR,CIS)
- Αύξηση ΚΡΧ επεμβάσεων κατά 101%
- Αύξηση επεμβάσεων βαλβίδων: 62%
- Επεμβ.καρδιάς/πλυθησμό:80/100.000
- Επεμβ. Βαλβίδων/πλυθ.:16.4/100.000
- % αντικατάσταση βαλβ./επ.καρδιάς: 25.95%~21%
- Μηχανικές:77% του συνόλου βαλβίδων
- Περίπου 85.000 αντ.βαλβίδος/έτος

Χαρακτηριστικά βαλβίδων που βελτιώθηκαν τις δεκαετίες 80-90

- Αντοχή στο χρόνο
- Φιλικός στη συρραφή δακτύλιος
- Θόρυβος
- Θρομβογένεση



HEART REVIEW

Prosthesis-patient mismatch: definition, clinical impact, and prevention

P Pibarot, J G Dumesnil



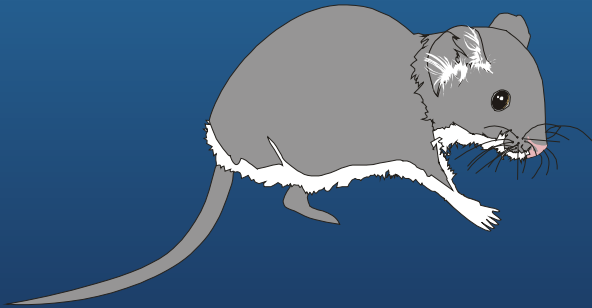
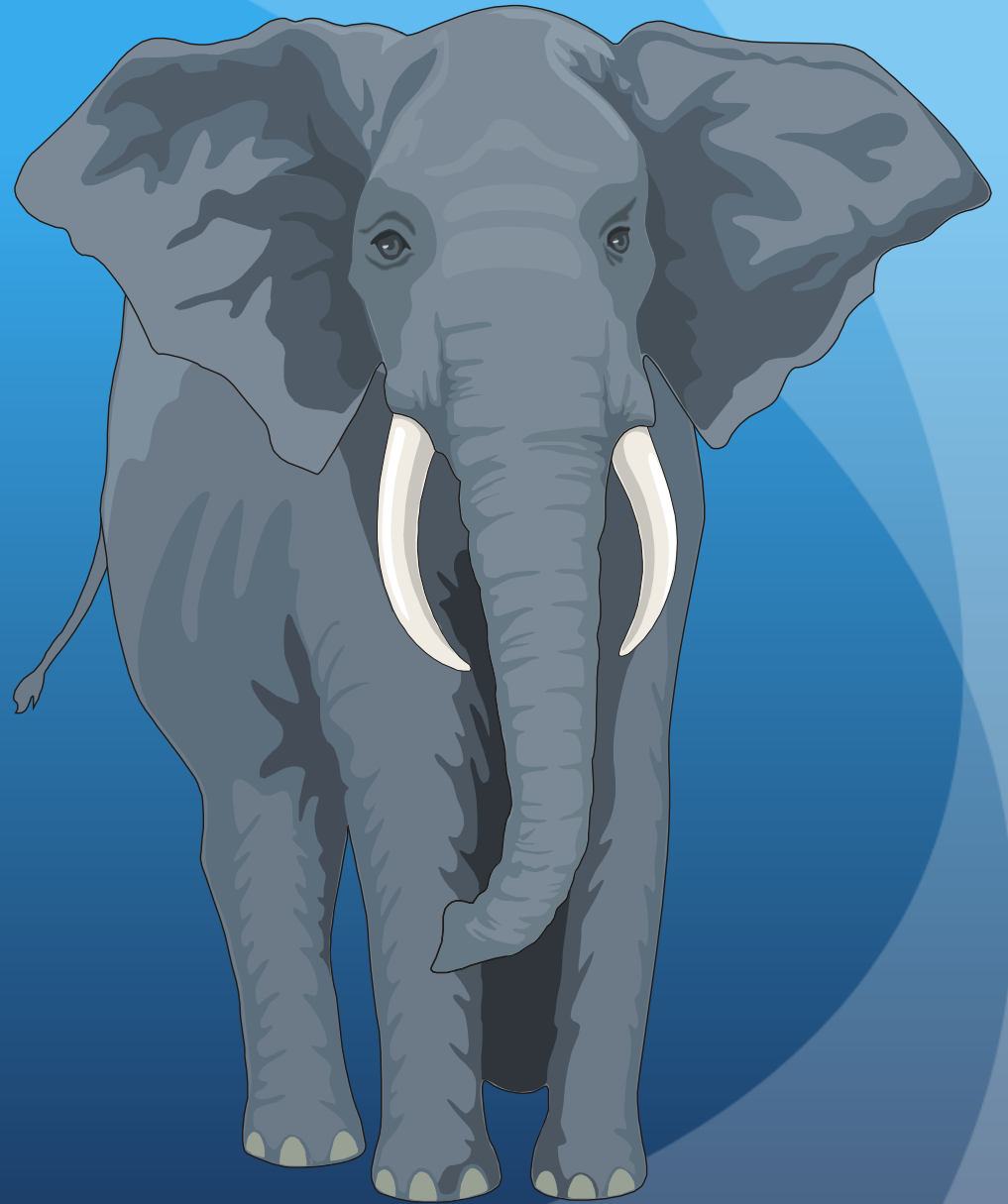
Heart 2006;**92**:1022–1029. doi: 10.1136/hrt.2005.067363

Prosthesis-patient mismatch (PPM) is present when the effective orifice area of the inserted prosthetic valve is too small in relation to body size. Its main haemodynamic consequence is to generate higher than expected gradients through normally functioning prosthetic valves. This review updates the present knowledge about the impact of PPM on clinical outcomes. PPM is common (20–70% of aortic valve replacements) and has been shown to be associated with worse haemodynamic function, less regression of left ventricular hypertrophy, more cardiac events, and lower survival. Moreover, as opposed to most other risk factors, PPM can largely be prevented by using a prospective strategy at the time of operation.

Κίνδυνος: Δυσαναλογία ασθενούς– προσθετικής βαλβίδος (PPM)

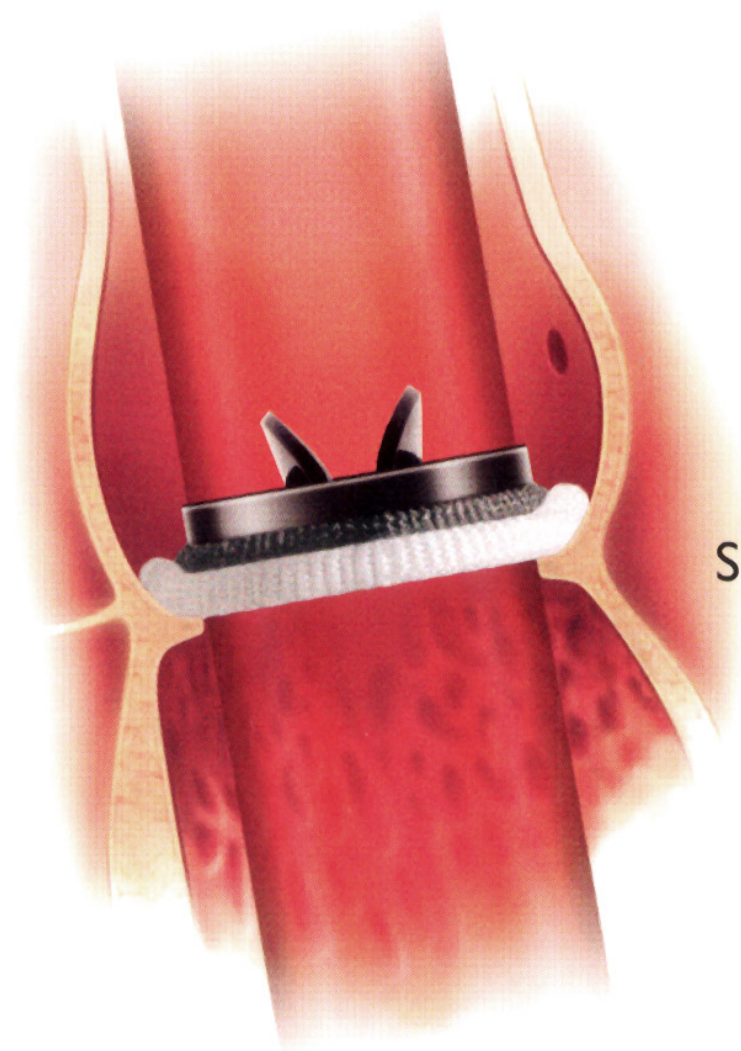
Ορισμός: Προσθετική βαλβίδα πολύ μικρή σε σχέση με το μέγεθος του ασθενούς (BSA)

Συνέπεια: Εμμένουσα εμφάνιση υψηλής μετεγχειρητικής κλίσης πίεσης στην Αορτική βαλβίδα



$$\text{Gradient} = \frac{Q^2}{K \times EOA^2}$$





Size 20

Γεωμετρική Επιφάνεια έναντι Οφέλιμης Επιφάνειας

Βιολογική Βαλβίδα



Μηχανική Βαλβίδα



$$EOAI = \frac{EOA}{BSA}$$

$$EOA = (CSA_{LVOT} \times TVI_{LVOT}) / TVI_{AO}$$

Σοβαρότητα της Δυσαναλογίας

Σοβαρή

Μέτρια

Μικρή/Καθόλου

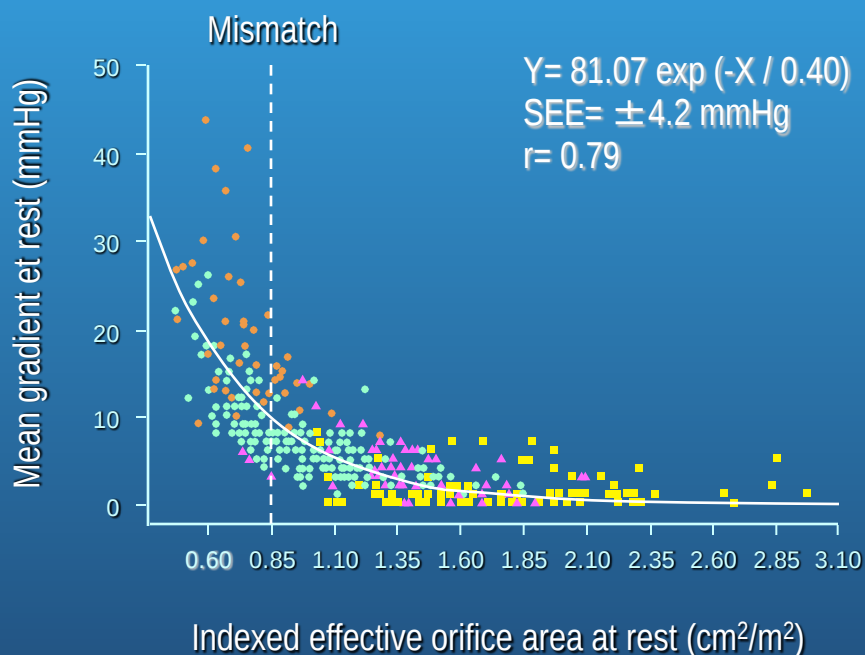


IEOA (cm^2/m^2) 0.65

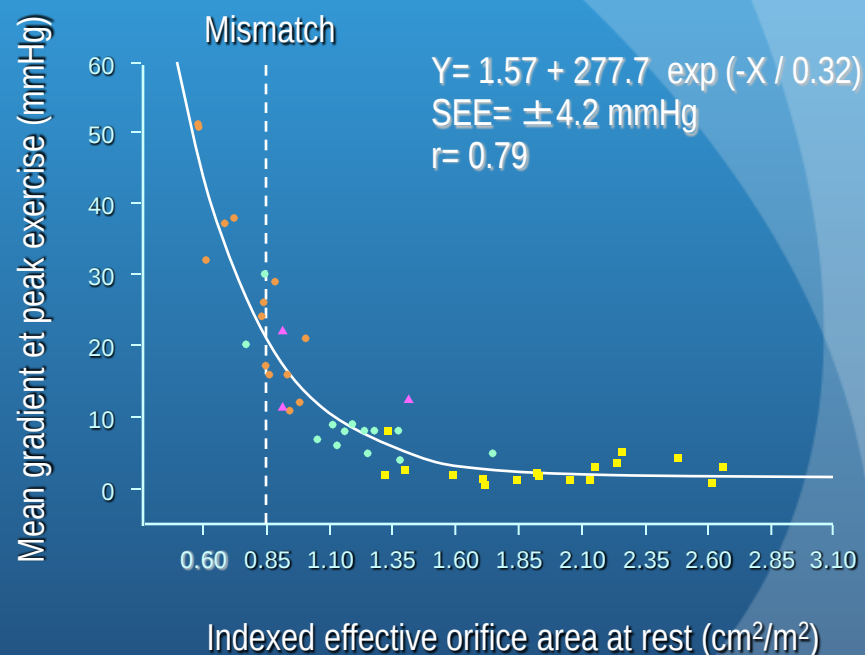
0.85

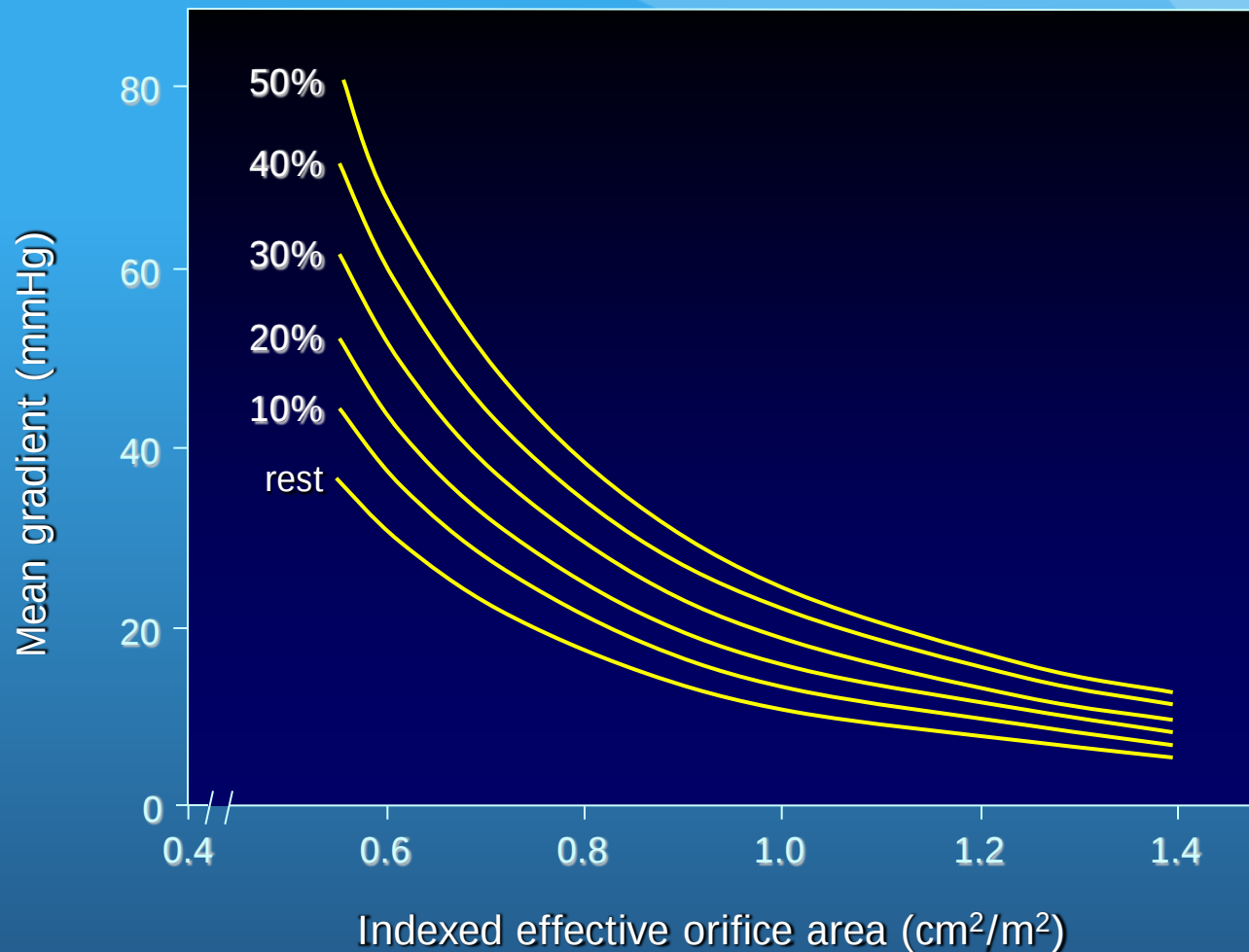
Ορισμός δυσαναλογίας βασισμένος στο δείκτη οφέλιμης επιφάνειας της βαλβίδος

Panel A



Panel B



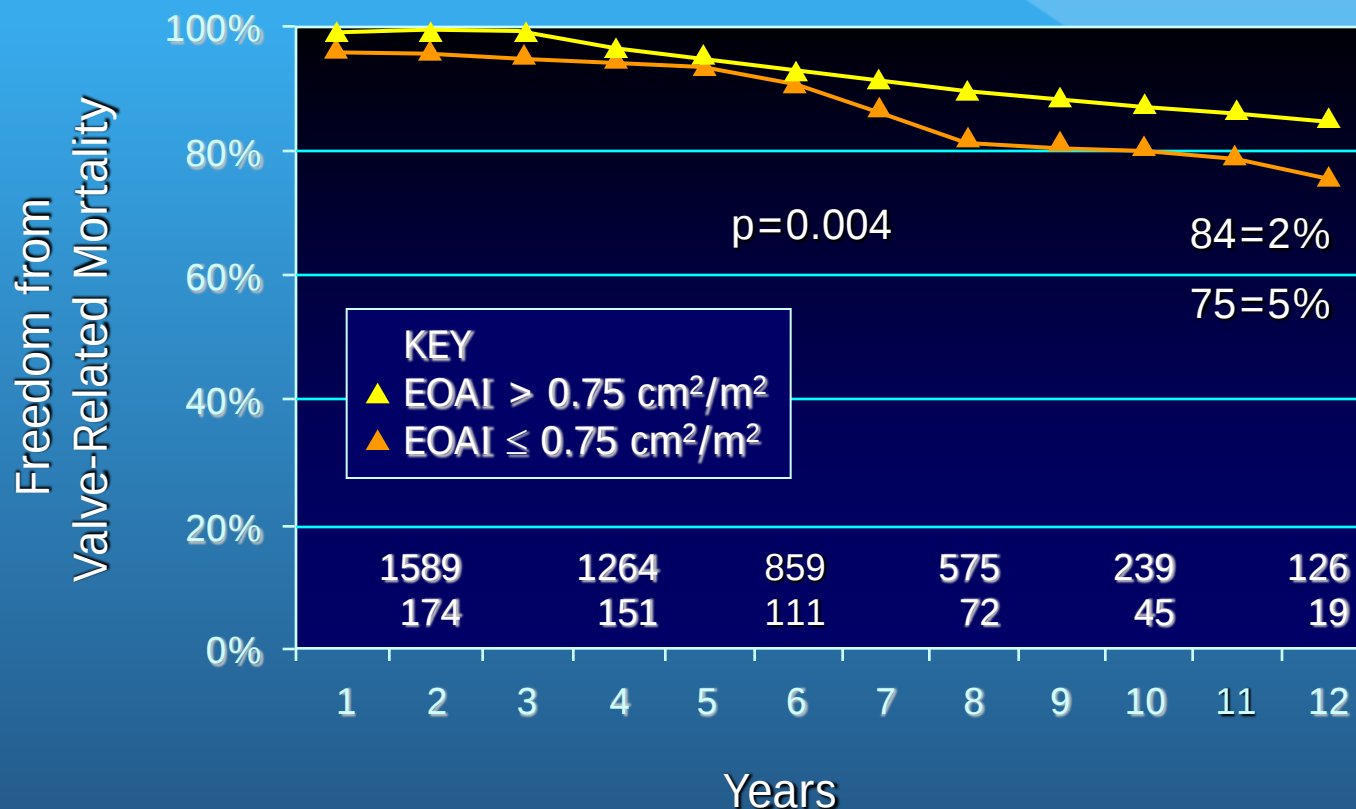


Relations between mean tranvalvular pressure gradients and indexed effective orifice areas for aortic bioprostheses studied in vitro in a physiologic pulse duplicator system, assuming a normal cardiac index of 3.0 liter/min per m² at rest and 10% to 50% increases in stroke volume, as may occur during maximal upright exercise. (Reproduced with permission from Dumesnil and Yoganathan [4].)

Mean In vivo Effective Orifice Area (cm²)

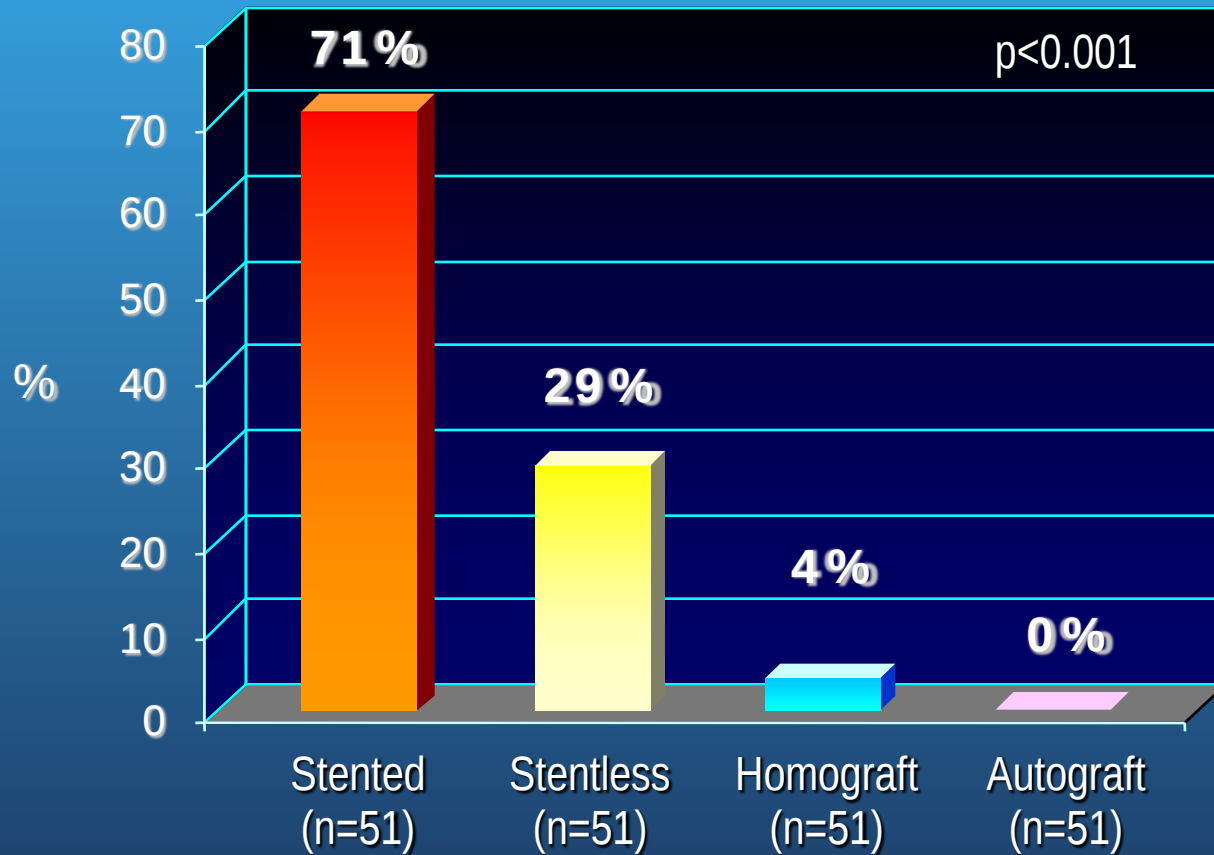
	SJM Regent ^{TM21}	Carbomedics TM Standard ²²	ATS Medical ^{TM23}	Edwards Perimount ^{®24}
19mm	1.7	0.9	1.2	1.1
21mm	2.0	1.3	1.5	1.3
23mm	2.5	1.4	1.7	1.5

Freedom from Valve-Related Mortality



Freedom from valve-related mortality in patients with prosthesis mismatch (EOA/BSA ≤ 0.75 cm²/m²). There was a significant difference in 12-year survival between patients with mismatch (Small) vs those with an adequately sized valve (Large).

Πιθανότητα εμφάνισης Δυσαναλογίας σε μικρούς αορτικούς δακτυλίους ανάλογα με την προσθετική βαλβίδα (βιολογικές)



Κλινική επίπτωση της δυσαναλογίας ασθενούς-προσθετικής βαλβίδος

- Μικρότερη βελτίωση του κλινικού σταδίου
- Αυξημένη πιθανότητα απώτερων καρδιακών γεγονότων
- Μικρότερη μετεγχειρητική ελάττωση της υπερτροφίας της αριστεράς κοιλίας
- Αύξηση αιμορραγικών επεισοδίων
- Μεγαλύτερη απώτερη θνητότητα (>7 έτη)
- Μεγάλη επίπτωση στην περιεγχειρητική θνητότητα, ειδικά αν συνυπάρχει δυκινησία της αριστερής κοιλίας

Pibarot & Mumesnil, JACC 2000;36:1131-1141

Blais et al, Circulation 2013;108:983-988

Milano et al, Ann Thorac Surg.2012;73:37-43

Connolly, Schaff et al, Circulation 2010;101:1940-6

David TE Curr Prob Surg 2009;36:421-504

Προδιαθεσικοί Παράγοντες του Μετεγχειρητικού κλινικού σταδίου (NYHA)

Παράγων	1 έτος	3 έτη	5 έτη	7 έτη
Ηλικία	NS	NS	NS	0.001
Προεγχ.NYHA	0.001	0.001	NS	NS
Υπέρταση	NS	NS	NS	0.013
Διάταση αρ. Κοιλίας	0.02	NS	NS	NS
Δυσαναλογία	0.008	0.002	0.007	NS

Pibarot et al, J Heart Valve Dis 2008;7:211-8

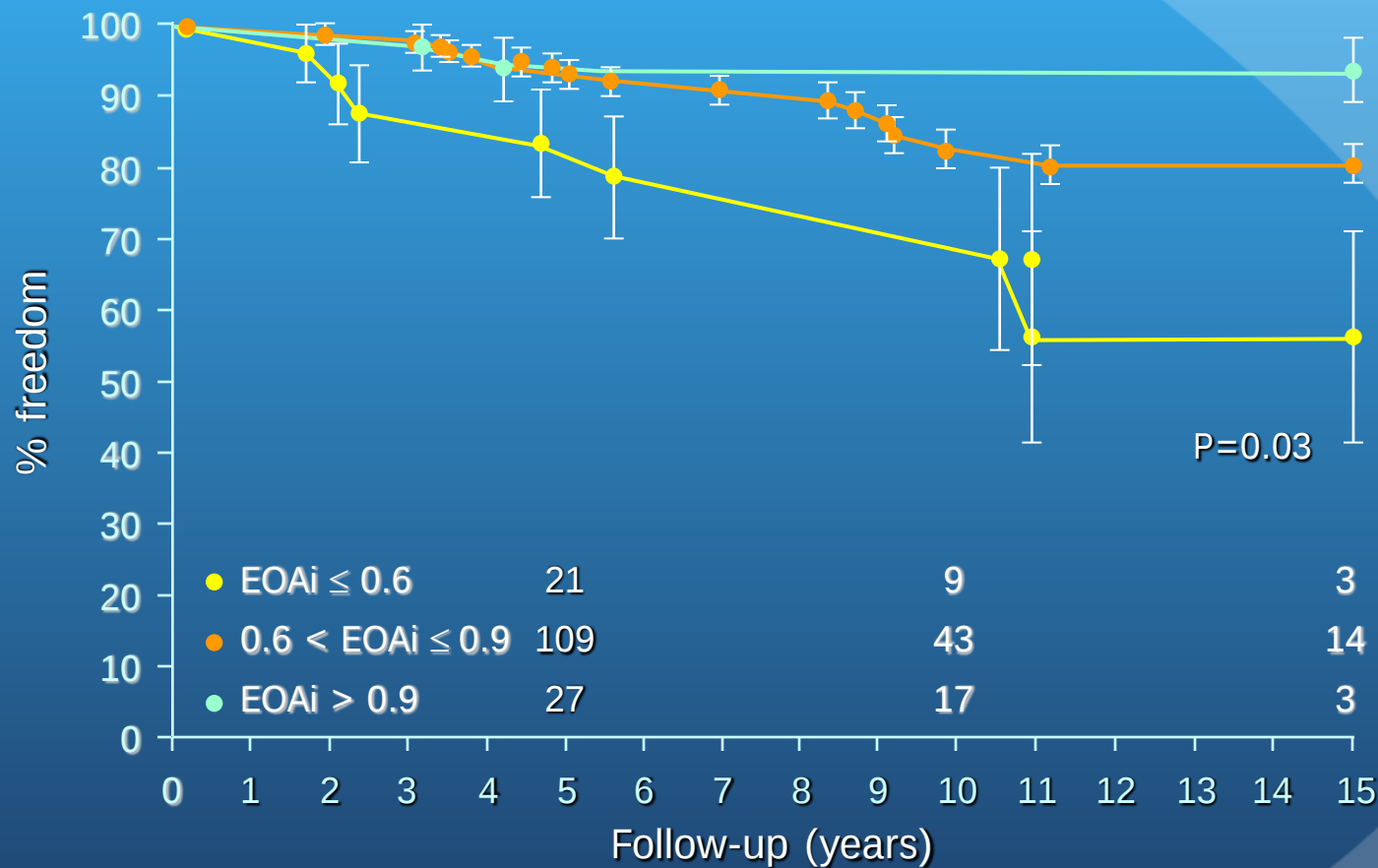
Ανεξάρτητοι Παράγοντες Μετεγχειρητικής Καρδιακής Ανεπάρκειας μετά από Αντικατάσταση Αορτικής Βαλβίδος

1681 ασθενείς, μέσω follow-up 4.4 έτη

- Ηλικία
- Προεγχειρητικό κλινικό στάδιο
- Αυξημένη διαστολική πίεση πνευμονικής αρτηρίας
- Κολπική μαρμαρυγή
- Στεφανιαία Νόσος
- Κάπνισμα
- Επανεπέμβαση
- Δυσαναλογία (ΕΟΑΙ > 0.80 cm²/m²). Παρουσίασε 60% αύξηση στο δείκτη θνητότητας ή μετατροπή του κλινικού σταδίου σε NYHA 3-4

Ruel et al, JTCVS 2003;127:149-159

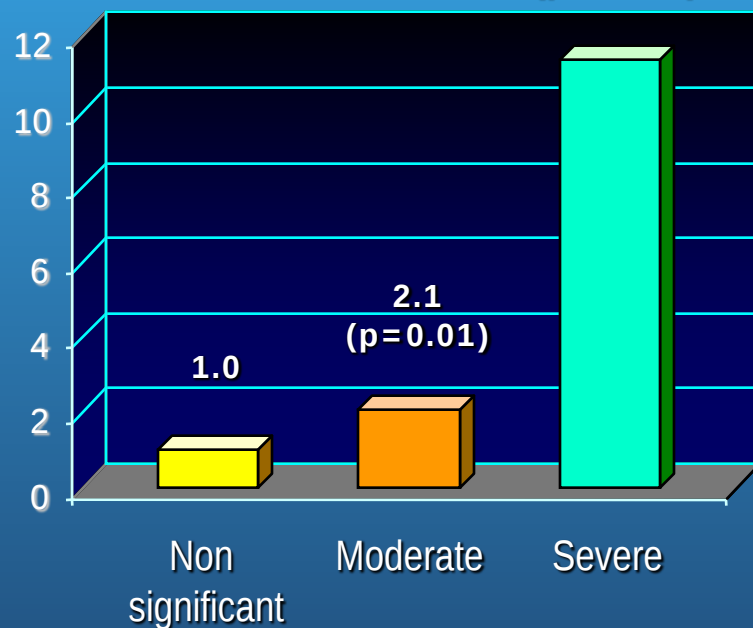
Απώτερα καρδιακά γεγονότα σε σχέση με τη δυσαναλογία βαλβίδος - ασθενούς



Επίπτωση της Δυσαναλογίας στην άμεση μετεγχειρητική θνητότητα μετά από αντικατάσταση αορτικής βαλβίδος (1266 pts)

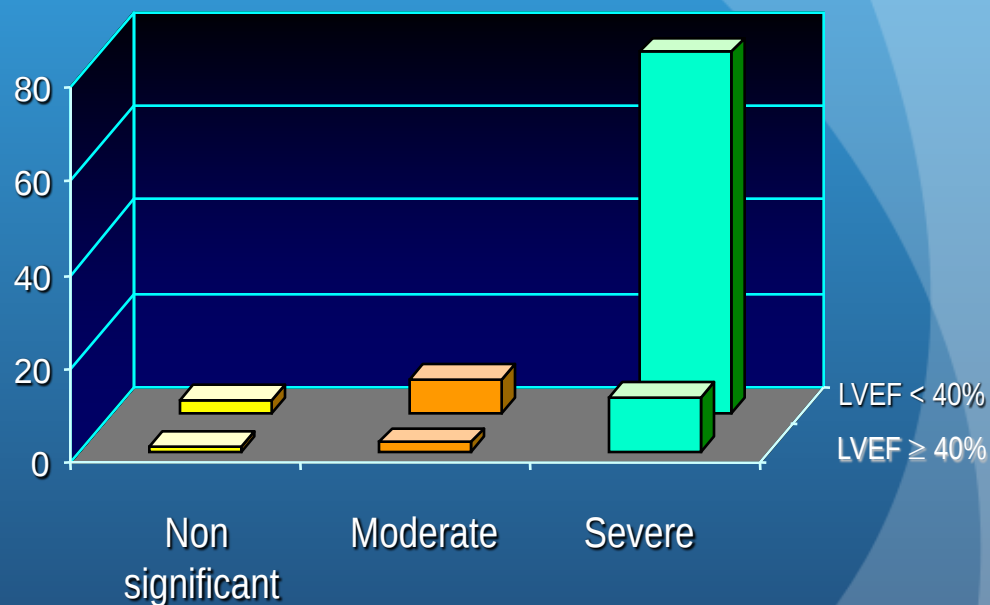
Mortality risk ratio

11.4
($p < 0.001$)

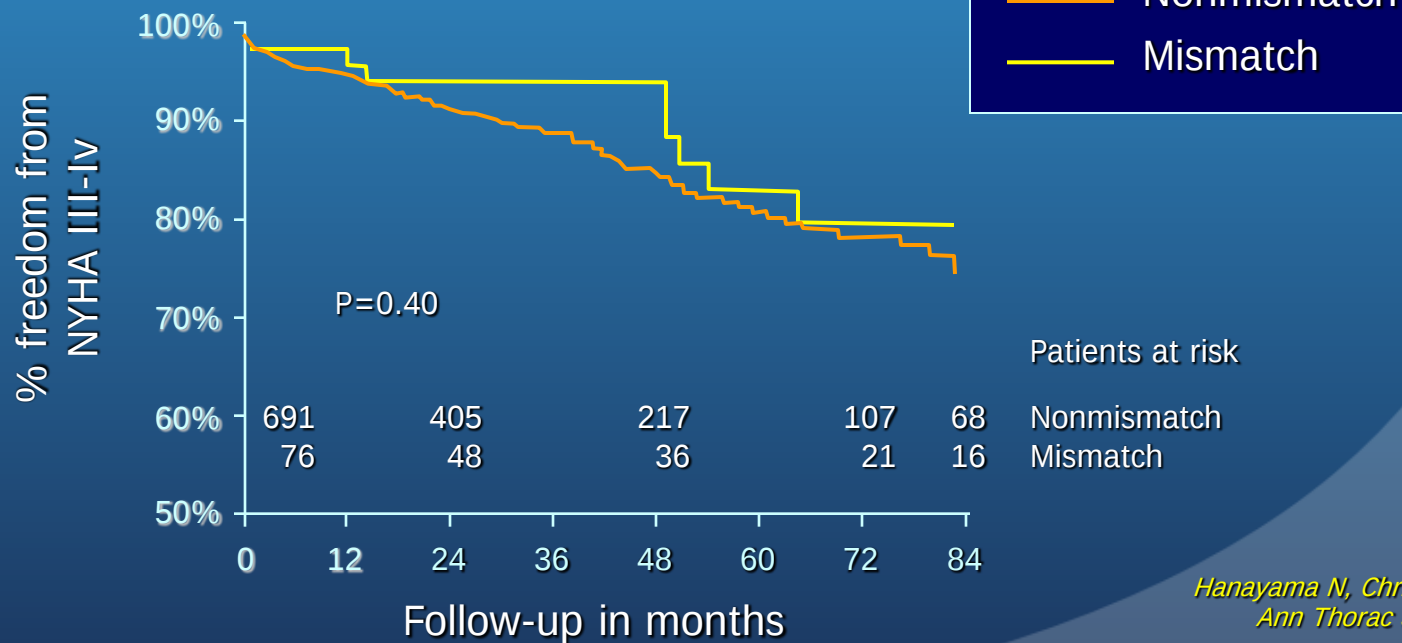
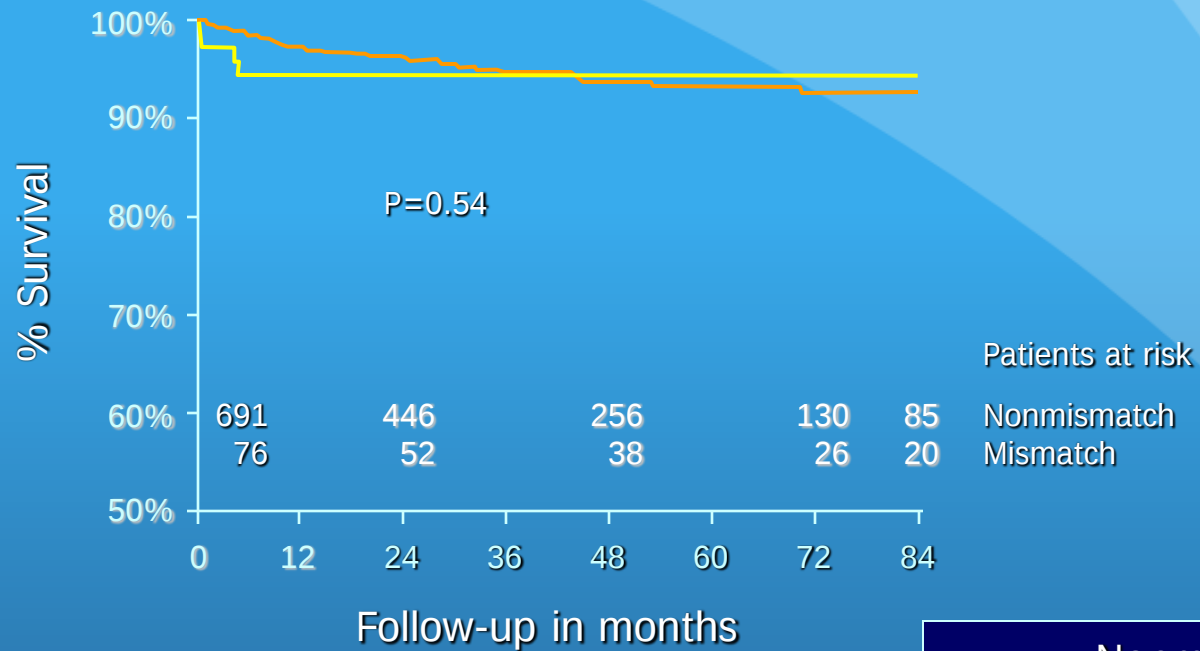


Valve prosthesis-patient mismatch

Mortality risk ratio



Valve prosthesis-patient mismatch



Patient's Characteristics by Patient-Prosthesis Mismatch

Characteristic	Non-Mismatch n = 692	PPM n = 76	p Value
Preoperative			
Age (y)	65.0 ± 11.6	62.2 ± 13.3	
Age > 70 y	36.1%	31.6%	
Female	31.1%	43.4%	0.029
Body surface area (m ²)	1.87 ± 0.22	1.89 ± 0.22	
Urgent surgery	17.6%	19.7%	
NYHA class III or IV	67.5%	77.6%	
Congestive heart failure	17.9%	14.5%	
Diabetes	12.3%	17.1%	
Hypertension	45.2%	40.8%	
COPD	6.8%	2.6%	
Peripheral vascular disease	10.8%	7.9%	
LV grade (3 or 4)	12.7%	13.2%	
Coronary artery disease	38.6%	38.2%	
Stenosis	68.8%	77.6%	
Regurgitation	26.7%	16.7%	
Prosthetic valve	3.6%	7.9%	
Operative			
Pump time (min)	143.1 ± 46.0	148.4 ± 52.6	
Cross-clamp time (min)	115.0 ± 36.0	118.7 ± 44.0	
Valve size (mm)	24.5 ± 2.5	22.4 ± 1.6	0.0001
Internal diameter (mm)	21.1 ± 2.5	19.2 ± 2.0	0.0001
Mechanical	35.3%	43.4%	
Toronto SP valve	24.0%	10.5%	0.008
Tissue valve (stented)	39.3%	46.1%	
Bentall or ascending aorta	8.8%	2.6%	
Annulus enlargement	4.2%	11.8%	0.0004
Postoperative			
Early mortality	0.14%	2.63%	0.001
ICU stay (day)	2.8 ± 7.0	3.0 ± 4.0	
Hospital stay (day)	10.3 ± 12.8	10.4 ± 7.1	
Cerebrovascular accident	4.9%	4.0%	
Low output syndrome	15.2%	31.6%	
Mean aortic gradients (mm Hg)	12.9 ± 6.4	21.3 ± 9.3	0.001
Follow-up			
Mean follow-up time (y)	41.1 ± 31.7	52.2 ± 39.1	0.02

COPD = chronic obstructive pulmonary disease; ICU = intensive care unit; LV = left ventricle; NYHA = New York Heart Association; PPM = patient-prosthesis mismatch.

*Hanayama N, Christakis G. et al
Ann Thorac Surg.:73, 2002*

2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: Executive Summary

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines

	Class ^a	Level ^b
A mechanical prosthesis is recommended according to the desire of the informed patient and if there are no contraindications for long-term anticoagulation. ^c	I	C
A mechanical prosthesis is recommended in patients at risk of accelerated structural valve deterioration. ^d	I	C
A mechanical prosthesis is recommended in patients already on anticoagulation as a result of having a mechanical prosthesis in another valve position.	I	C
A mechanical prosthesis should be considered in patients aged <60 years for prostheses in the aortic position and <65 years for prostheses in the mitral position. ^a	IIa	C
A mechanical prosthesis should be considered in patients with a reasonable life expectancy, ^f for whom future redo valve surgery would be at high risk.	IIa	C
A mechanical prosthesis may be considered in patients already on long-term anticoagulation due to high risk of thromboembolism. ^g	IIb	C

Table 18 Choice of the aortic/mitral prosthesis. In favour of a bioprosthesis.

	Class ^a	Level ^b
A bioprosthesis is recommended according to the desire of the informed patient	I	C
A bioprosthesis is recommended when good quality anticoagulation is unlikely (compliance problems; not readily available) or contraindicated because of high bleeding risk (prior major bleed; comorbidities; unwillingness; compliance problems; lifestyle; occupation).	I	C
A bioprosthesis is recommended for reoperation for mechanical valve thrombosis despite good long-term anticoagulant control.	I	C
A bioprosthesis should be considered in patients for whom future redo valve surgery would be at low risk.	IIa	C
A bioprosthesis should be considered in young women contemplating pregnancy.	IIa	C
A bioprosthesis should be considered in patients aged >65 years for prosthesis in aortic position or >70 years in mitral position, or those with life expectancy ^f lower than the presumed durability of the bioprosthesis. ^d	IIa	C

ΣΤΡΑΤΗΓΙΚΗ ΑΠΟΦΥΓΗΣ ΔΥΣΑΝΑΛΟΓΙΑΣ

1. Μέτρηση BSA

$$BSA = \sqrt{\frac{\text{Ύψος (cm)} \times \text{Βάρος}}{36.000}}$$

2. Καθορισμός της ελάχιστης αποδεκτής ωφέλιμης βαλβιδικής επιφανείας ώστε να αποφευχθεί το mismatch

$$(\text{π.χ. } 1.60\text{m}^2 \times 0.85 \frac{(\text{cm}^2)}{(\text{m}^2)} = 1.36 \text{ cm}^2)$$

3. Επιλογή βαλβίδος με το κατάλληλο ΕΟΑ από τους πίνακες που δημοσιεύονται

Χειρουργικές Δυνατότητες αποφυγής Δυσαναλογίας

- Εμφύτευση λειτουργικά καλύτερων Βαλβίδων
 - Αστήρικτες Βαλβίδες
 - Νέας γενιάς μηχανικές Βαλβίδες
 - Ομοιομοσχεύματα
 - Εγχείρηση Ross
 - Μεγέθυνση αορτικού δακτυλίου

Στρατηγικές αποφυγής Δυσαναλογίας 657 ασθενείς, αναδρομική μελέτη

Ηλικία 73 ± 12 έτη, 61% γυναίκες, BSA: $1.80 \pm 0.23 \text{m}^2$

ΠΡΟΒΛΕΠΟΜΕΝΟ ΕΟΑΙ

$> 0.85 \text{cm}^2/\text{m}^2$

$< 0.85 \text{cm}^2/\text{m}^2$

Μεγέθυνση αορτικού δακτυλίου

AVR: 543 ασθ.

Ποσοστό Δυσαναλογίας 2,6%

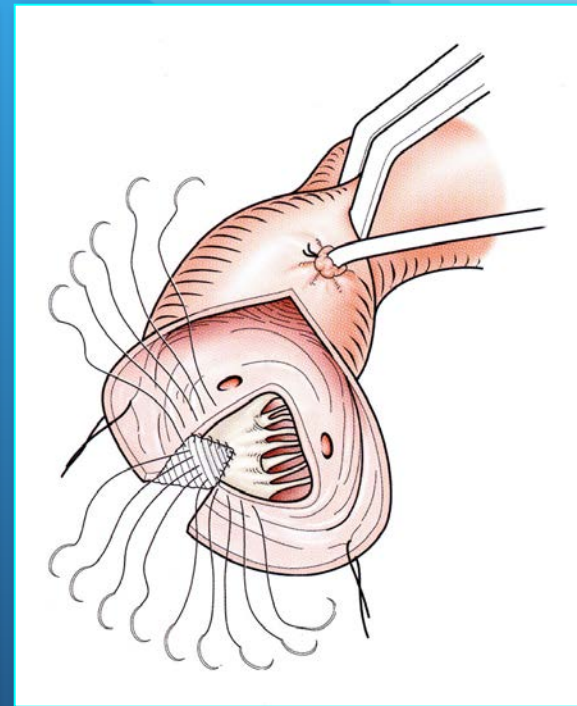
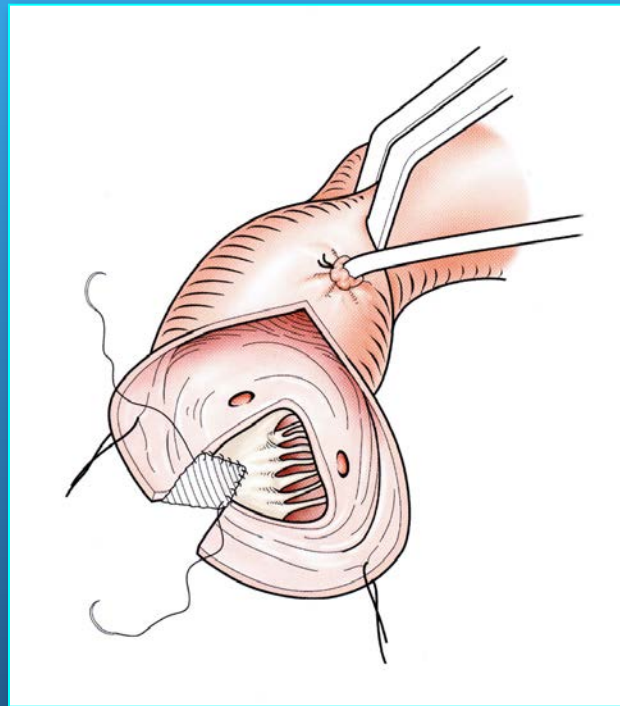
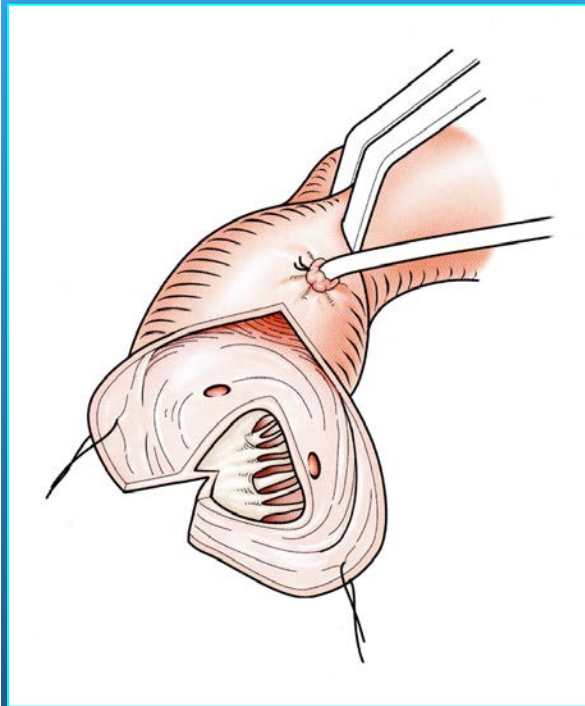
2.4%

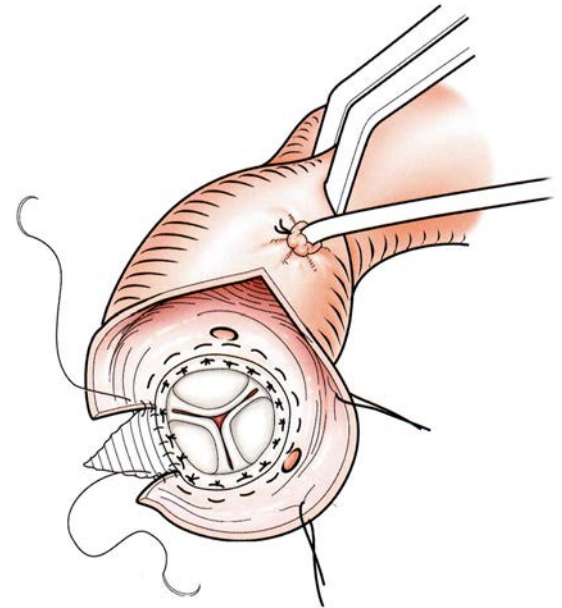
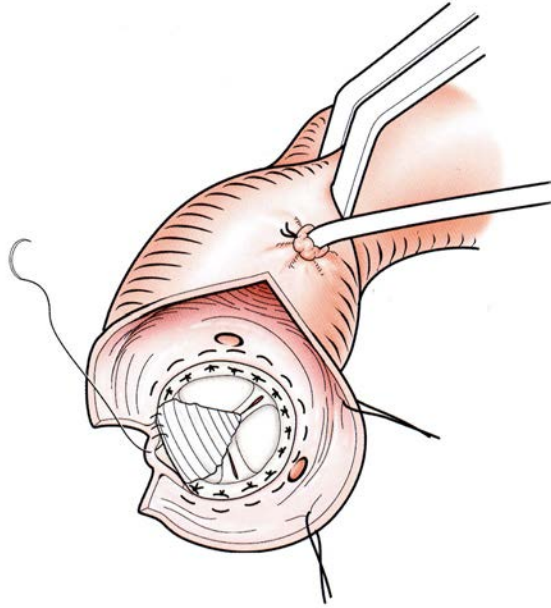
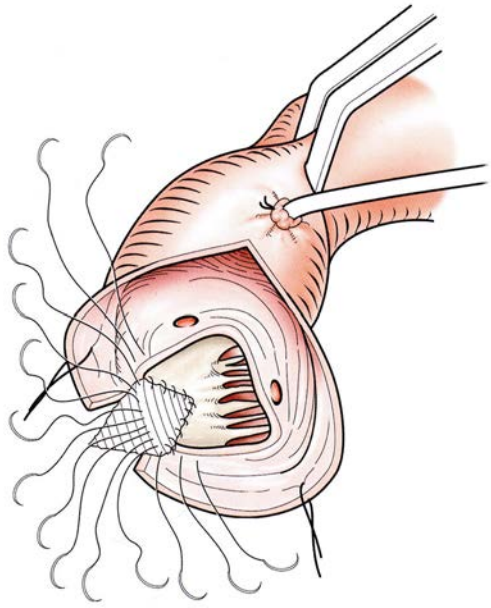
Χειρουργική θνητότητα 0,9%

4.1%

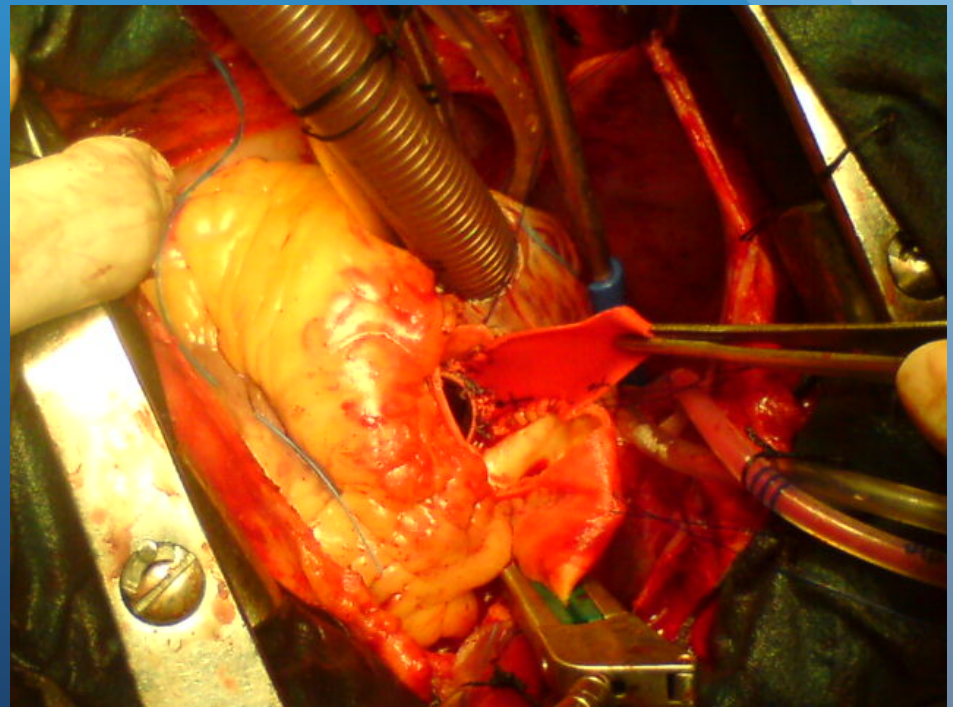
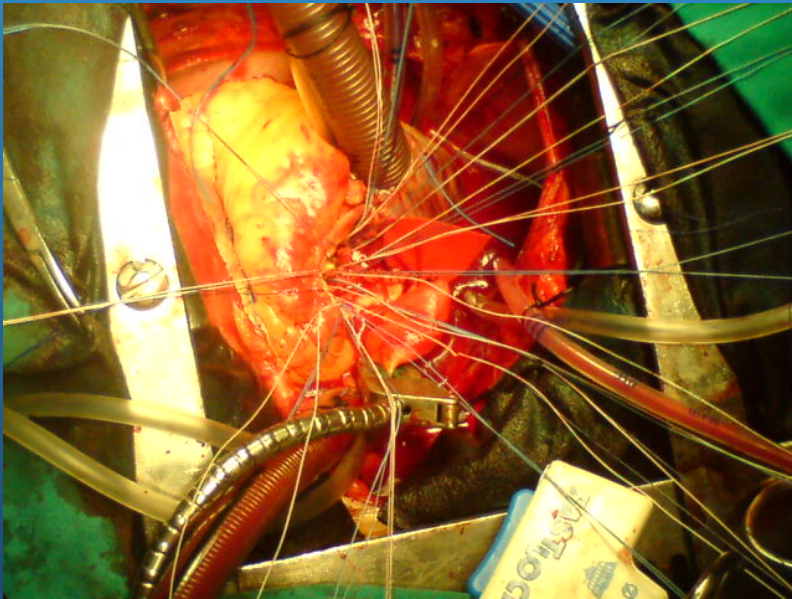
ΜΕΘΟΔΟΙ ΔΙΕΥΡΥΝΣΗΣ ΑΟΡΤΙΚΟΥ ΔΑΚΤΥΛΙΟΥ

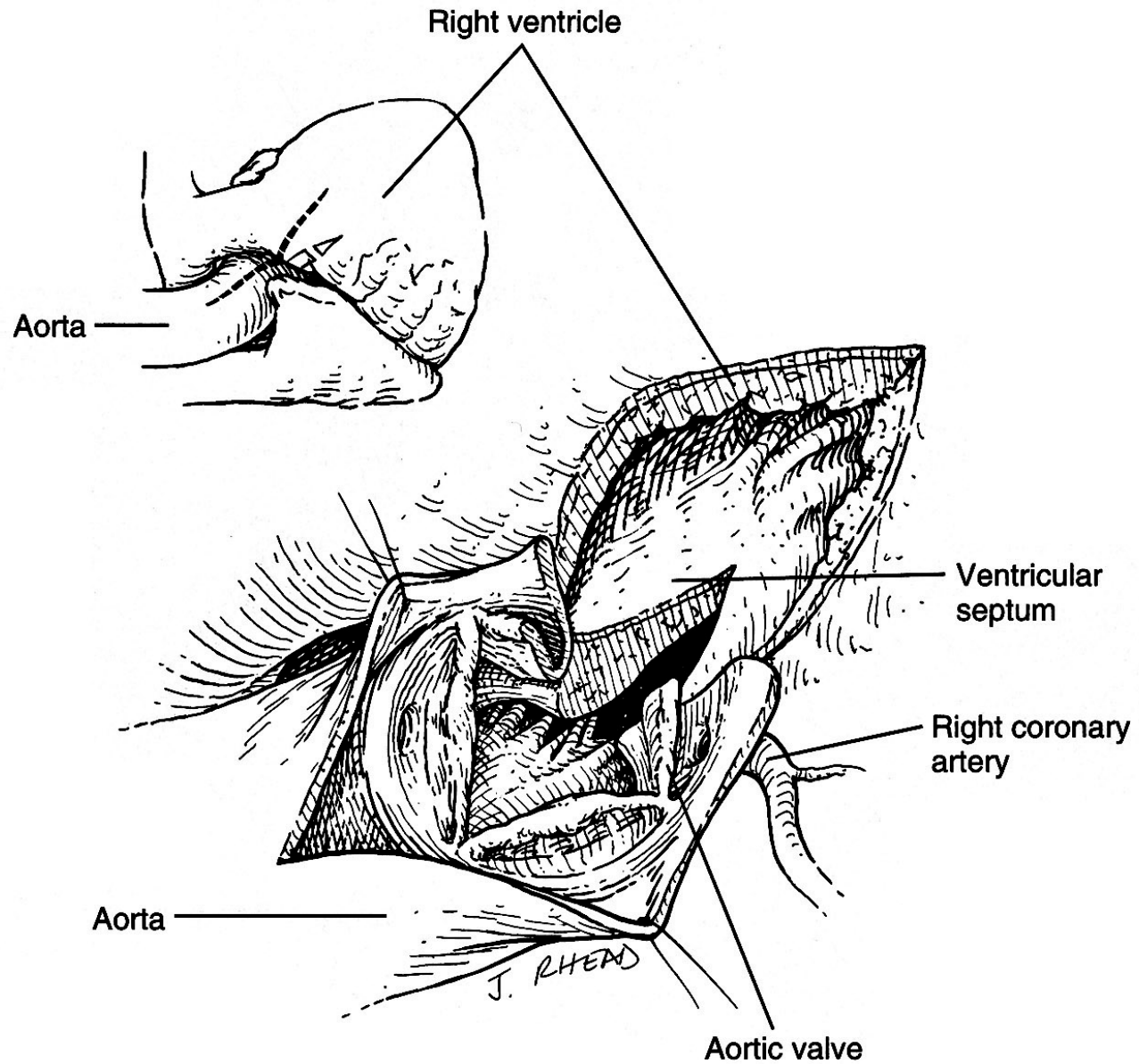
1. Nicks R, et al: Thorax 1970;25:339
2. Konno S, et al: J Thorac Cardiovasc Surg 1975;70:909 Κυρίως σε παιδιά ή σε περιπτώσεις που απαιτείται διεύρυνση >4 mm
3. Manouguian S et, al: J Thorac Cardiovasc Surg 1979;78:402

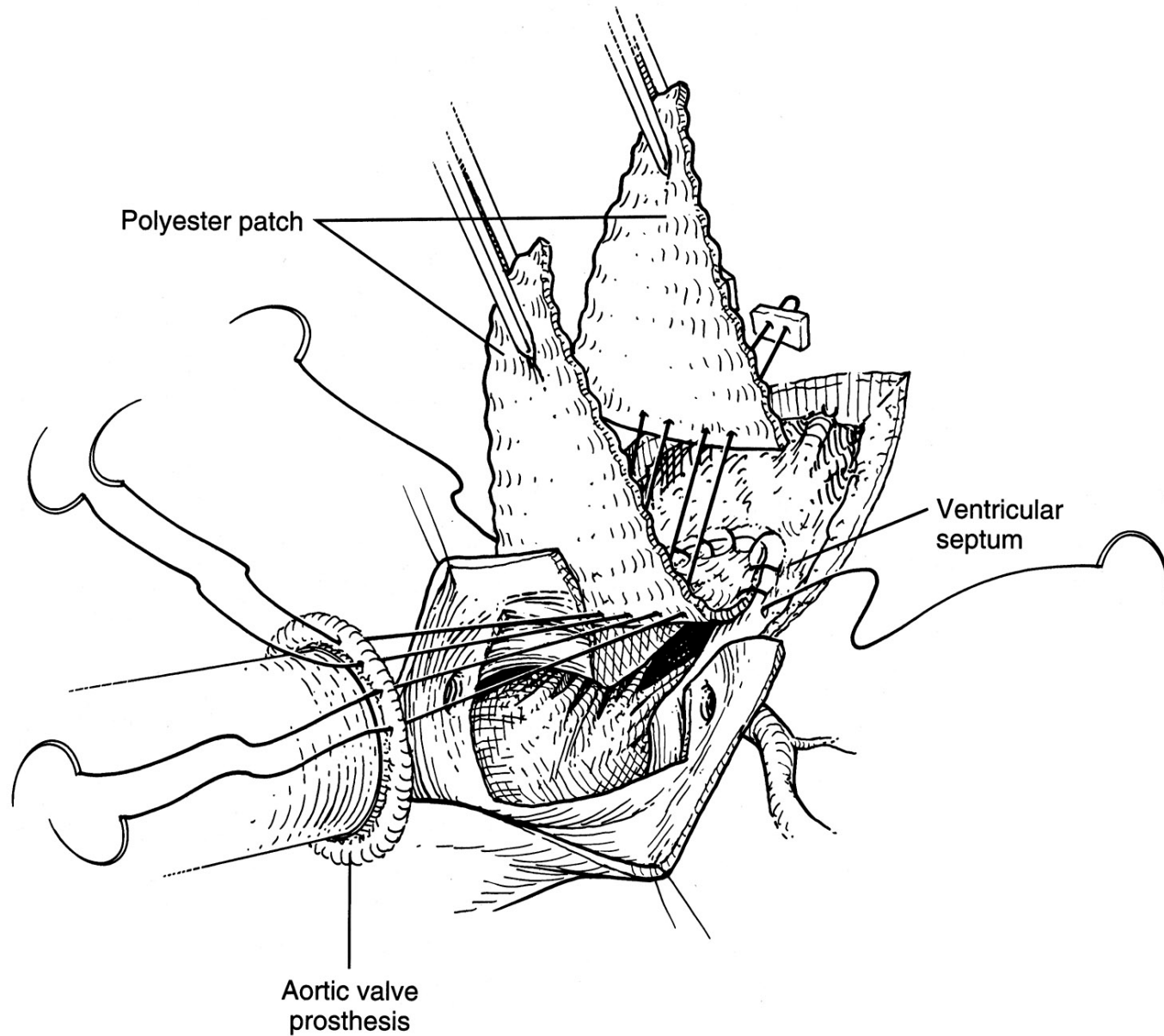


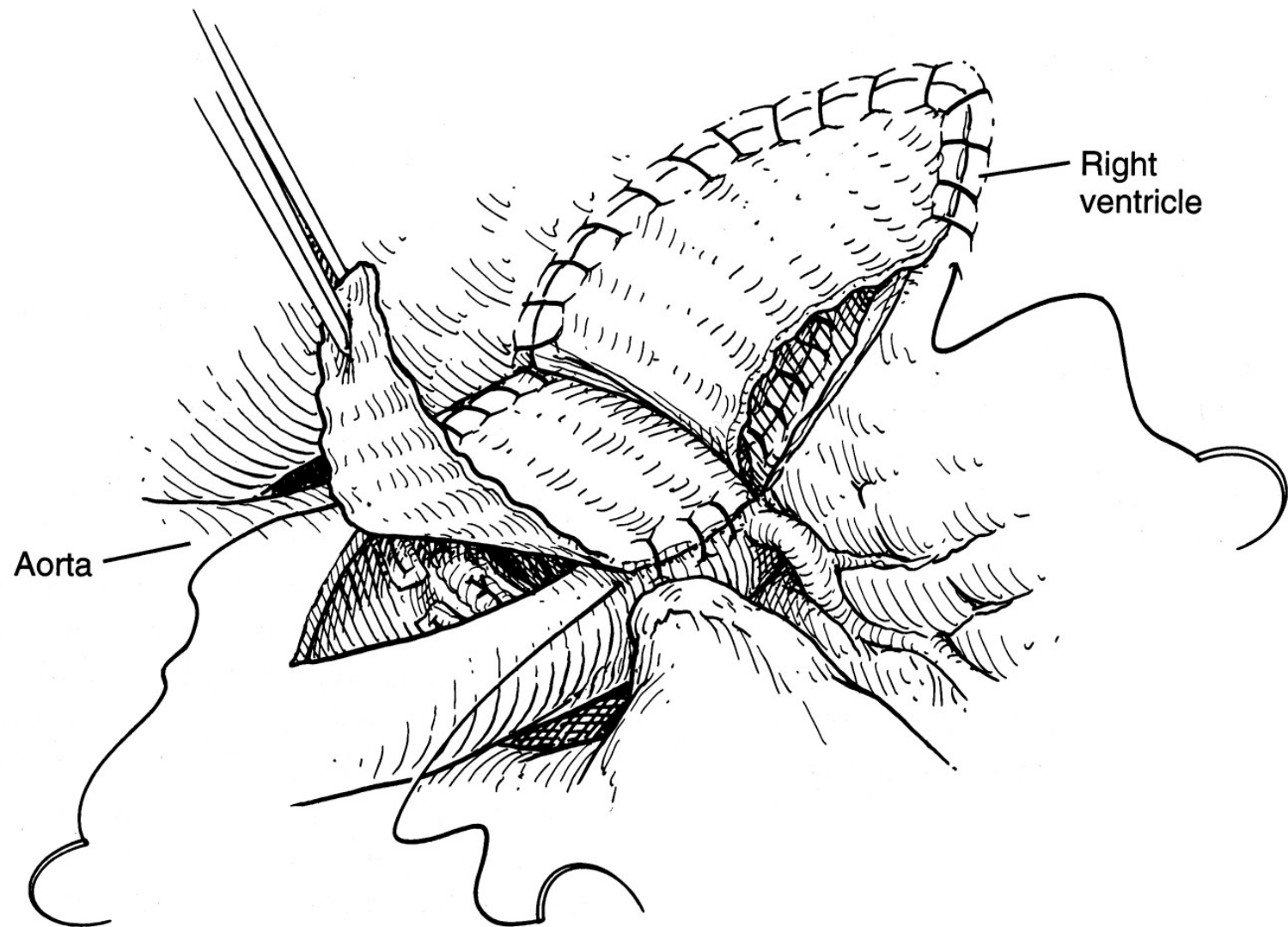


Manouguian Evaggelismos









ΕΜΠΕΙΡΙΑ ΔΙΕΥΡΥΝΣΗΣ ΑΟΡΤΙΚΟΥ ΔΑΚΤΥΛΙΟΥ ΣΤΟΝ ΕΥΑΓΓΕΛΙΣΜΟ

Περίοδος 1991-2002: 12 επεμβάσεις διεύρυνσης
του αορτικού δακτυλίου

7 άνδρες ,5 γυναίκες ηλικίας 50-78 ετών (μ.ο. 67)

8 περιπτώσεις Marfanoid

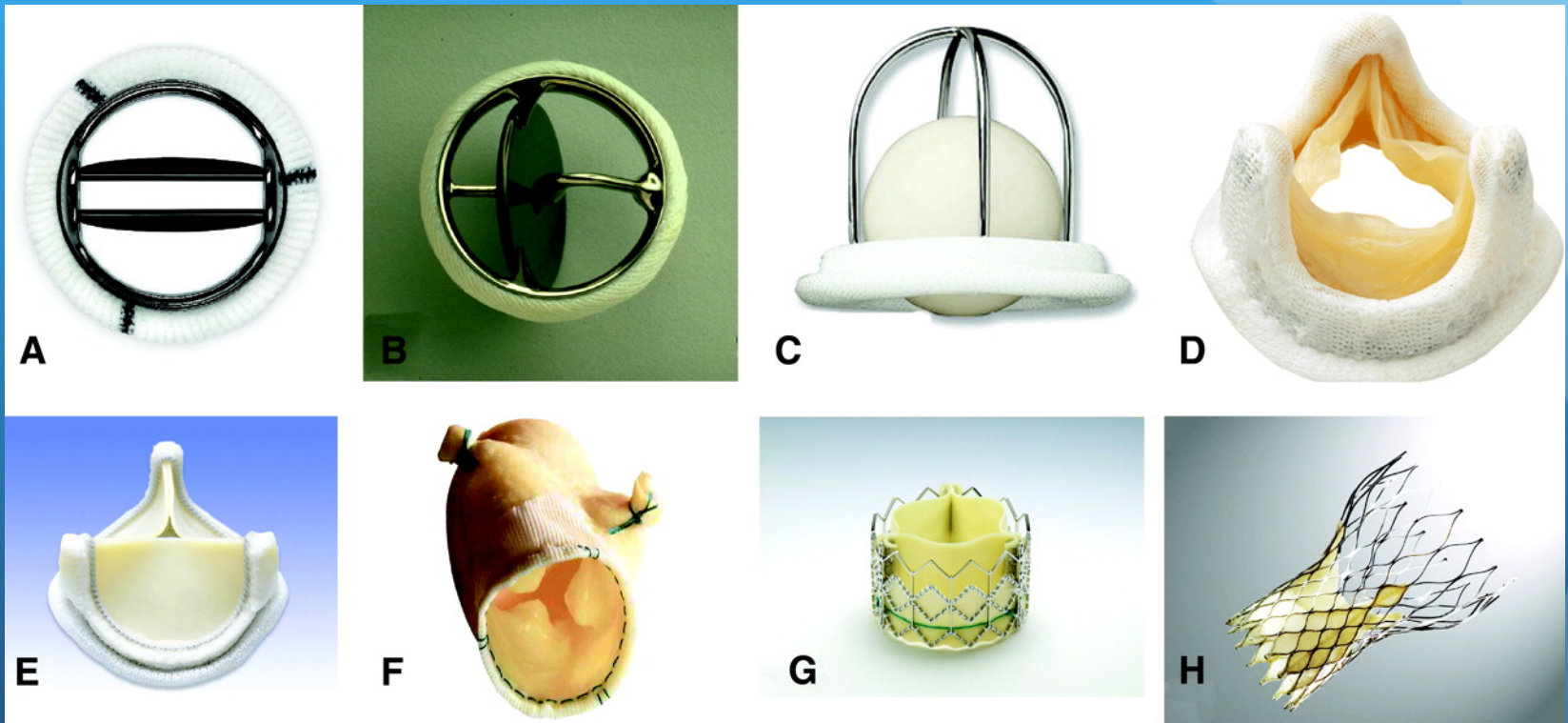
Σε δύο έγινε και αορτοστεφανιαία παράκαμψη

1 μτχ θάνατος λόγω MOF

8 X 21 mm 4 X 23 mm

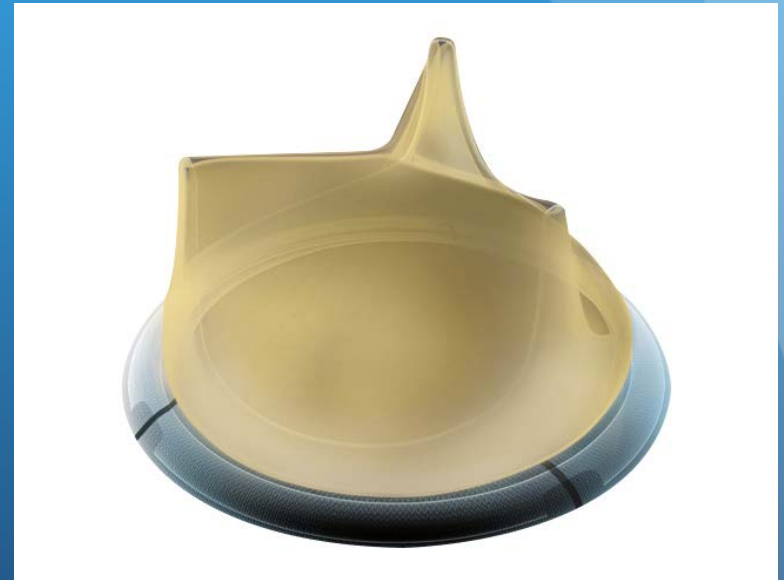
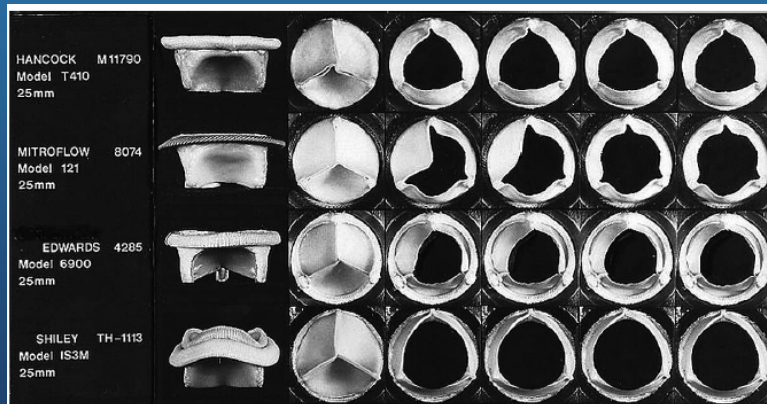
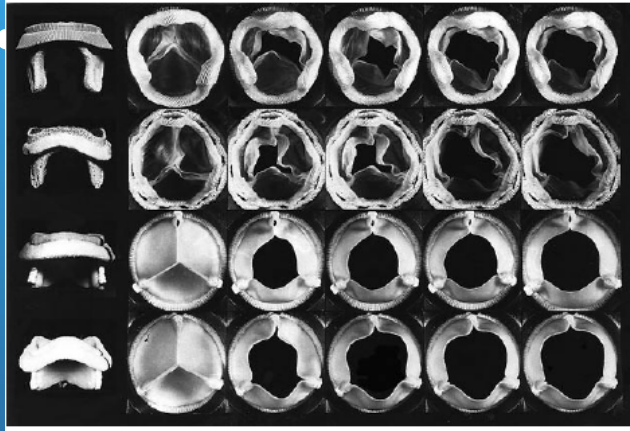
Μτχ gradient: 8-19mmHg (μ.ο. 12,3 mmHg)

Figure 1. Different types of prosthetic valves.

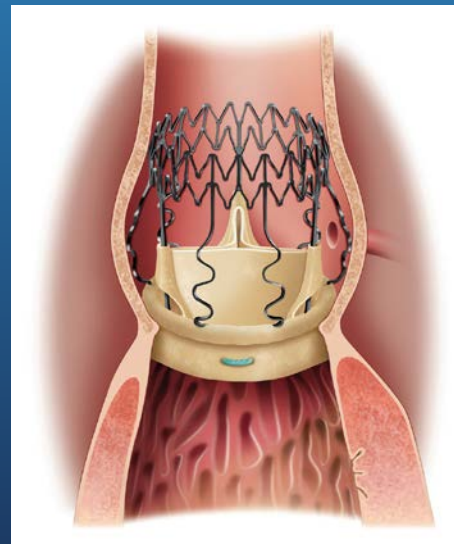
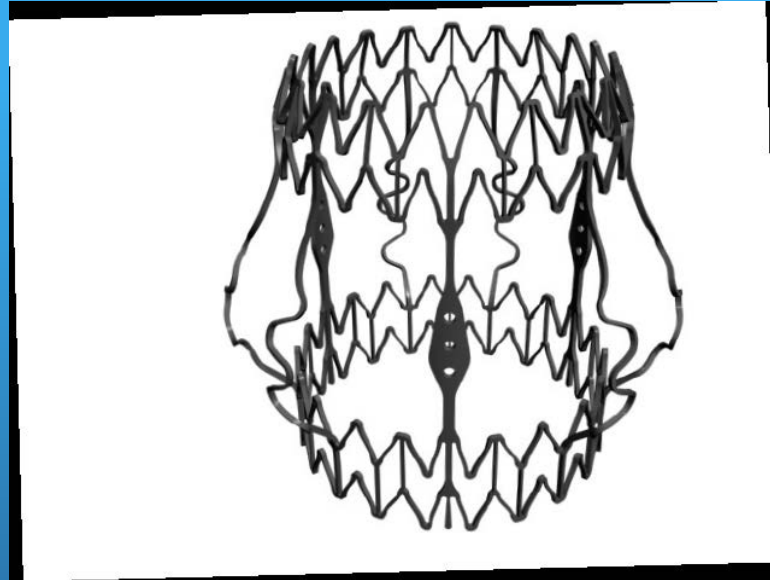


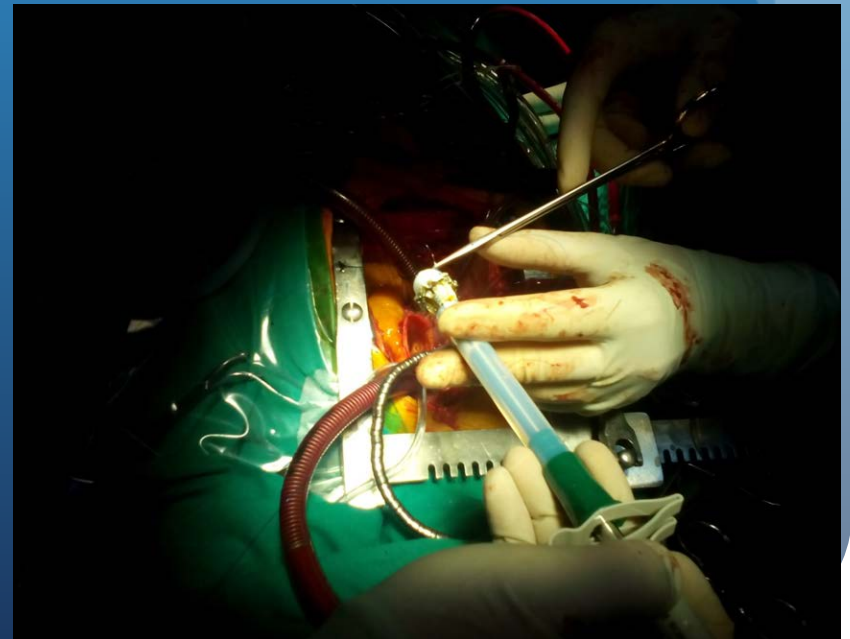
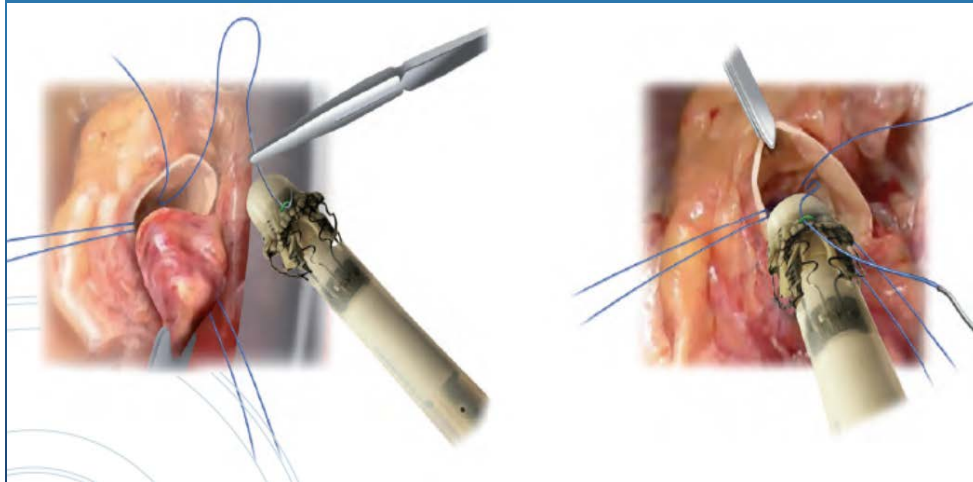
Pibarot P , Dumesnil J G Circulation 2009;119:1034-1048

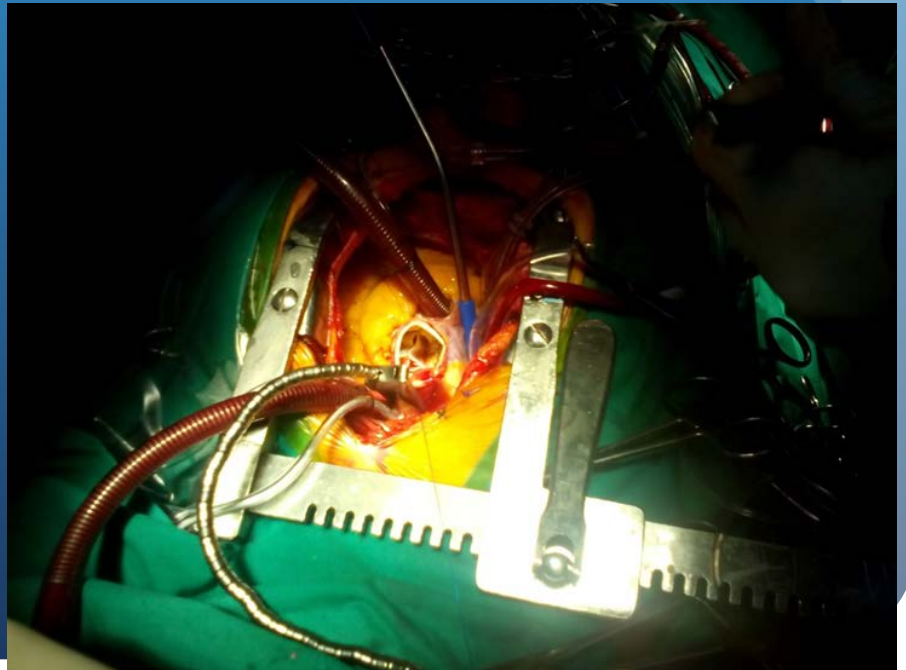
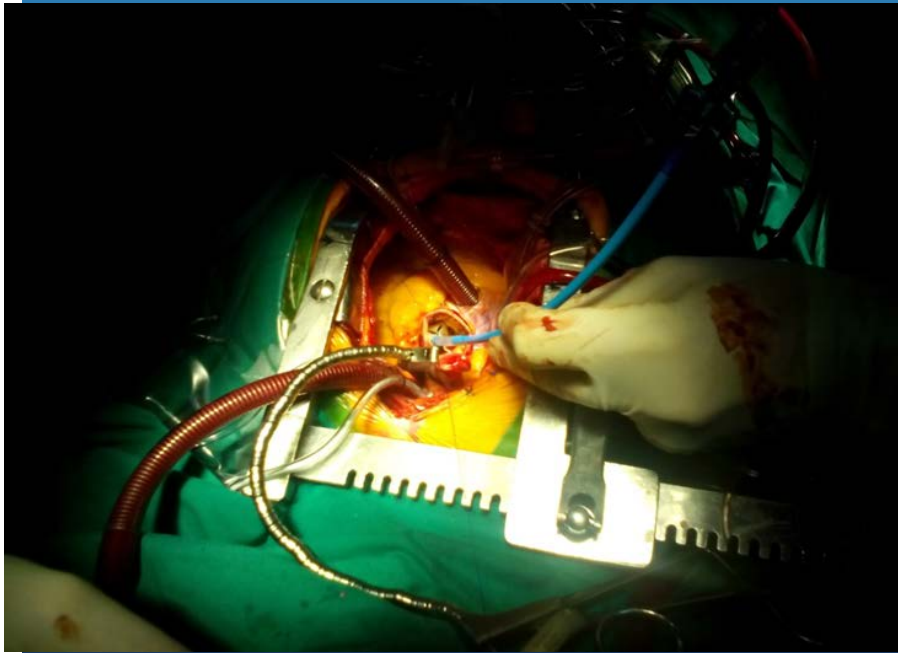
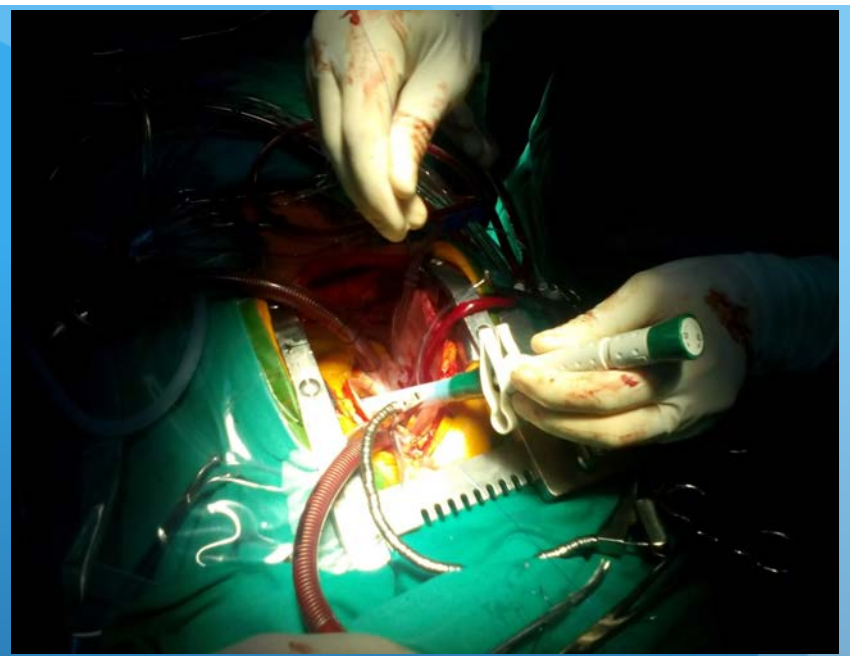
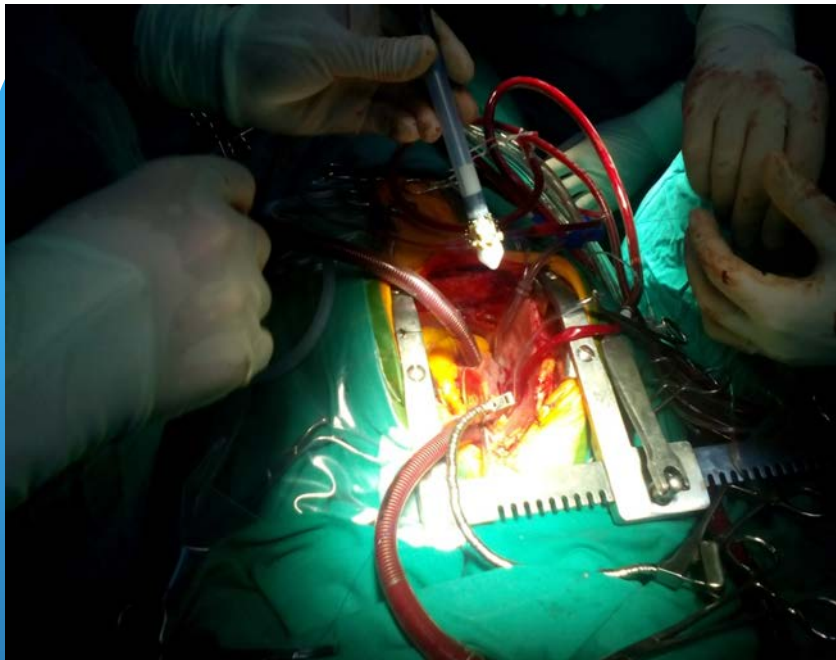
The Pericardial Heart Valve

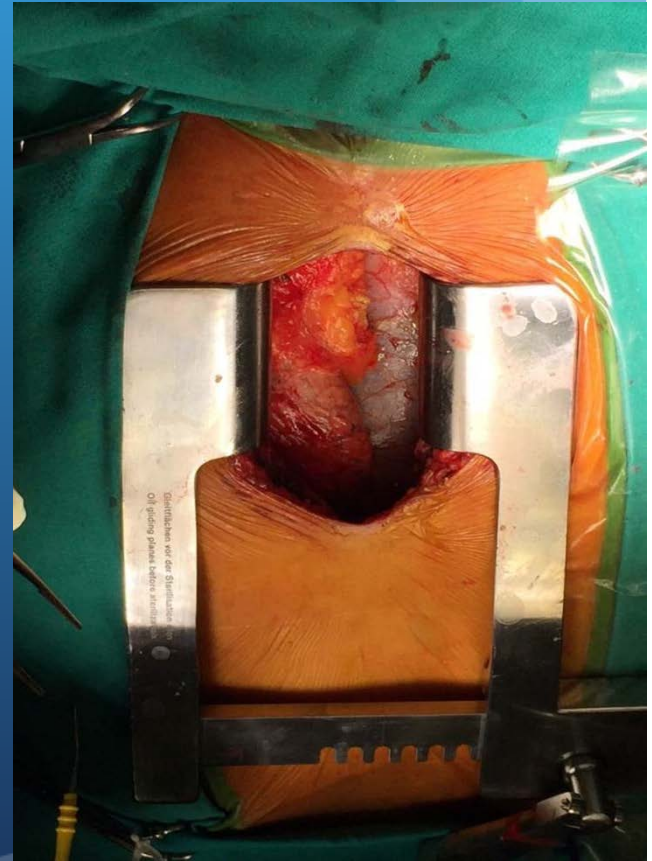
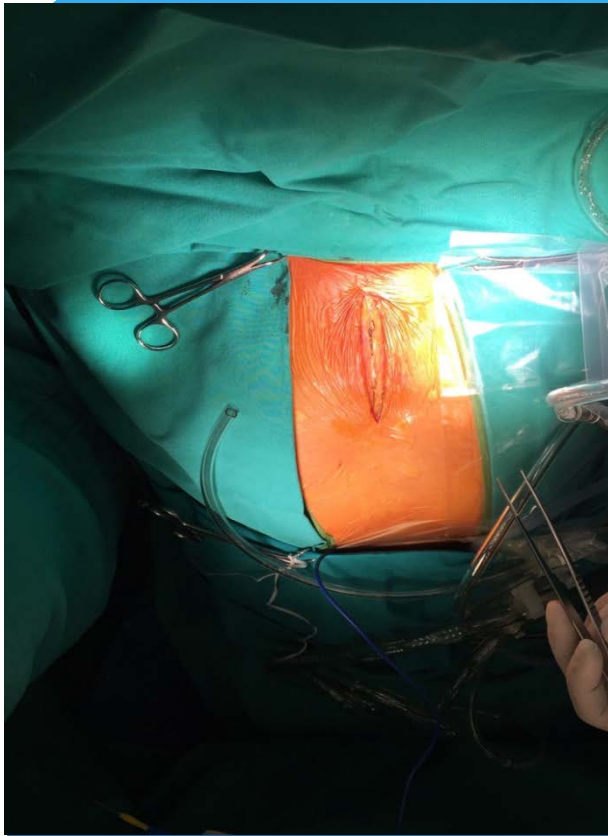


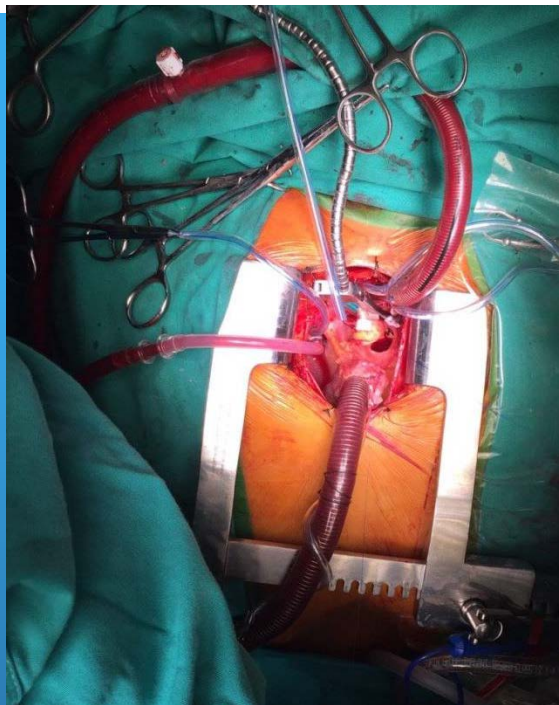
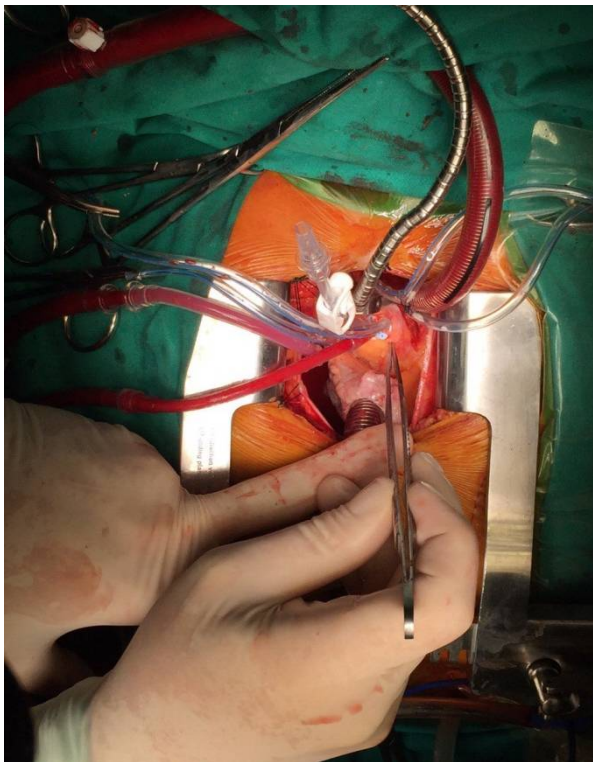
ΑΥΤΟΕΚΠΤΥΣΣΟΜΕΝΗ ΧΩΡΙΣ ΡΑΜΜΑΤΑ





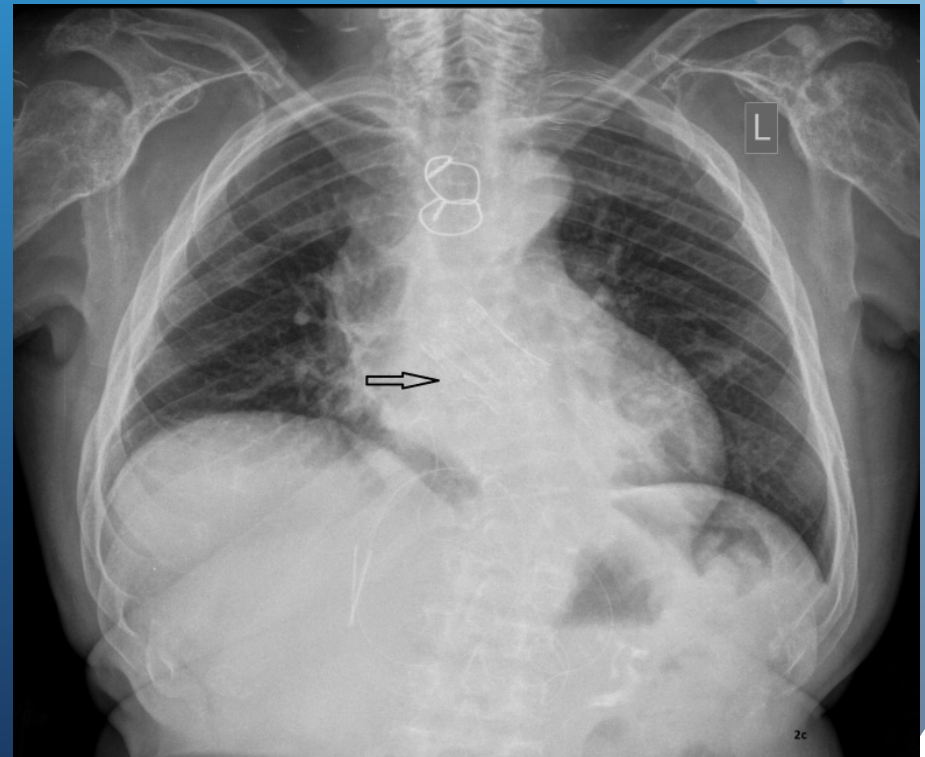






Perceval S aortic valve implantation in an achondroplastic Dwarf.

Baikoussis NG, Argiriou M, Argiriou O, Dedeilias P.
Ann Card Anaesth. 2016 Jan-Mar;19(1):166-8.



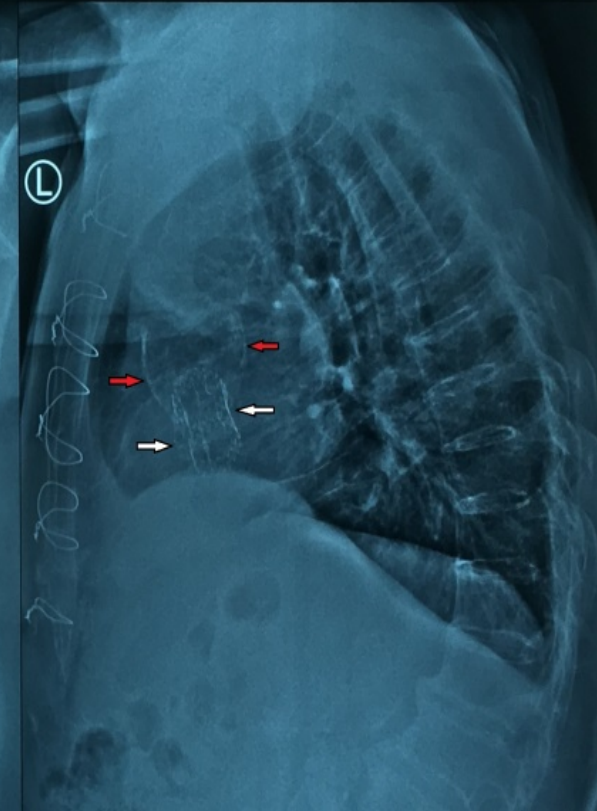
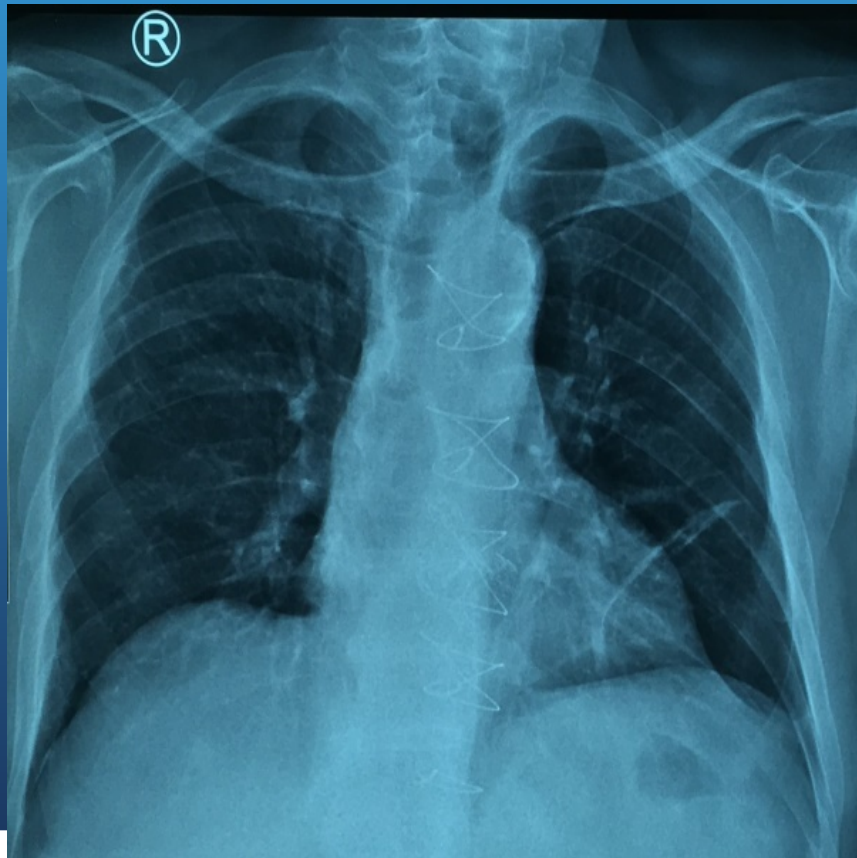
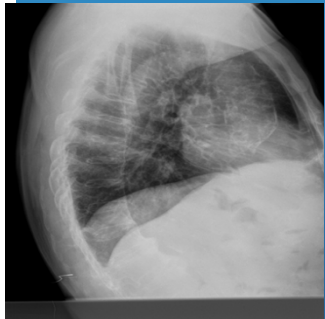
Perceval S in porcelain aorta

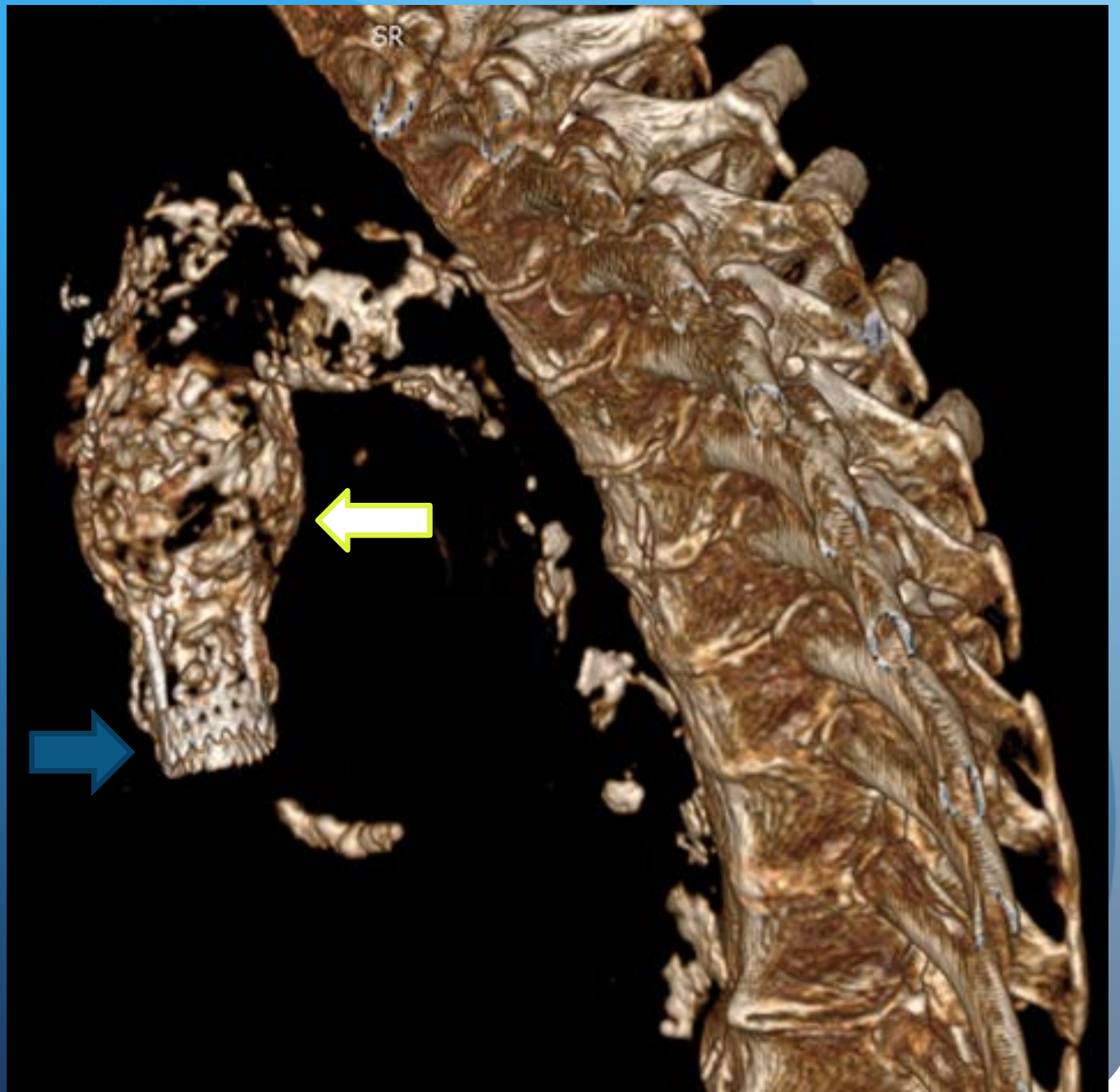
The use of the Perceval S aortic valve in patients with porcelain aorta; is this ideal option?

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STUDY PROTOCOL

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Aortic valve replacement in elderly with small aortic root and low body surface area; the Perceval S valve and its impact in effective orifice area

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ORIGINAL ARTICLE – ADULT CARDIAC

Aortic valve replacement in geriatric patients with small aortic roots: are sutureless valves the future?[†]

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Patient Characteristics

	SVP (25) <i>Sutureless valve</i>	BVP (25) <i>Classic (SOPRANO)</i>
Number of patients	25	25
Age (mean)	80 ± 3.3	79 ± 4.1
Sex (♀ / total)	18/25	17/25
Euro Score II	9.5 ± 3.5	9.9 ± 3.6
BSA (m²)	1.45 ± 1.2	1.78 ± 1,1
Stroke history	3/25 (12%)	2/25(8%)
Preop rhythm	2/25 rbbb, 1/25 lbbb, 16/25 NSR , 1/20 A-F	3/25 rbbb, 2/25 A-F, 15/25 NSR
Concomitant CAD requiring CABG	3/25 (2-3grafts)	2/25 (1graft each)

Table 1. Patient characteristics and results of our initial experience.

	SVP (25) <i>Sutureless valve</i>	BVP (25) <i>Classic biological valve (SOPRANO)</i>	P
Number of patients	25	25	
Preop. max gradient	88±10.5	89±12.5	
Postop. max gradient	23.5±19.20 mmHg	24.5±19.90 mmHg	0.670
Preop EOA	0.45 ± 0.19	0.47 ± 2.1	
Postop EOA	<u>1.5±0.3 cm2</u>	<u>1.1±0.5 cm2</u>	<u>0.002</u>
Operation time	<u>149.38±15.22 min</u>	<u>206.64±42.85 min</u>	<u>p<0.001</u>
CPB time	<u>73.75±8.12 min</u>	<u>120.36±28.31 min</u>	<u>p<0.001</u>
Ischemia time	<u>40±5.50 min</u>	<u>86±15.86 min</u>	<u>p<0.001</u>
Temporary postop pacing, permanent	15/20-3/20	2/20- 0/15	
Death	0/25	1/25 arrhythmia	

Mid-term follow-up after suture-less aortic heart valve implantation

Grzegorz Filip^{1#}, Radosław Litwinowicz^{1#}, Bogusław Kapelak¹, Jacek Piatek¹, Magdalena Bartus², Janusz Konstanty-Kalandy¹, Maciej Brzezinski³, Krzysztof Bartus¹

TABLE 2 Comparison of the Hemodynamic Profile of the Sutureless Versus Transcatheter Aortic Valve Prosthesis at Discharge

	Sutureless AVR (n = 40)	TAVR (n = 40)	p Value
Maximal transaortic velocity, m/s	2.32 ± 0.44	1.88 ± 0.41	<0.001
Mean pressure gradient, mm Hg	10.72 ± 4.01	8.14 ± 4.21	0.006
Effective orifice area index, cm ² /m ²	0.76 ± 0.22	1.00 ± 0.30	<0.001
Prosthesis patient mismatch	27 (67.5)	12 (30.0)	0.001
Doppler velocity index	0.46 ± 0.11	0.57 ± 0.15	0.001
Prosthesis size/annulus diameter	0.97 ± 0.08	1.12 ± 0.11	<0.001
AR grade I	6 (15)	26 (65)	<0.001
AR grade II	2 (5)	9 (22.5)	<0.001
MR grade I-II	27 (69.3)	30 (76.9)	0.45
Left ventricular ejection fraction, %	63.50 ± 12.63	59.57 ± 10.46	0.15
Stroke volume index, ml/m ²	29.91 ± 10.47	35.56 ± 12.50	0.03
Low flow	29 (72.5)	18 (46.2)	0.02

Values are mean ± SD or n (%).

MR = mitral regurgitation; other abbreviations as in Table 1.

Surgical Sutureless and Transcatheter Aortic Valves

Hemodynamic Performance and Clinical Outcomes in Propensity Score-Matched High-Risk Populations With Severe Aortic Stenosis



Vasileios Kamperidis, MD, MSc, PhD,*† Philippe J. van Rosendaal, MD,* Arend de Weger, MD,‡
 Spyridon Katsanos, MD, PhD,* Madelien Regeer, MD,* Frank van der Kley, MD,* Bart Mertens, PhD,§
 Georgios Sianos, MD, PhD,† Nina Ajmone Marsan, MD, PhD,* Jeroen J. Bax, MD, PhD,* Victoria Delgado, MD, PhD*

Table 2 Hemodynamics echocardiographic parameters (mean and standard deviations)

Time period	LVOT diameter (cm)	LVOT peak velocity	LVOT TVI	Valve peak velocity	Mean systolic gradient	Peak systolic gradient	Valve TVI (cm)	EOA (cm ²)	EOAi (cm ² /m ²)
Perioperative period	1.9±0.1 (1.4–2.3)	1.2±0.1 (0.8–1.5)	19.7±1.2 (12.5–25.1)	1.8±0.1 (0.8–2.8)	7.1±1.1 (1.2–23)	12.9±1.6 (2.5–30)	27.9±1.9 (9–43.4)	1.87±0.58 (1.08–3.2)	1.08±0.27 (0.64–1.58)
3–6 months	1.8±0.04 (1.5–2.2)	1.2±0.05 (0.7–1.7)	24.3±1.5 (14.1–33.1)	2.1±0.1 (1.5–3.1)	9.5±0.8 (4.5–19.7)	18.1±1.41 (8.7–37.6)	41±2 (19.3–60.6)	1.74±0.39 (1.04–2.3)	0.98±0.19 (0.62–1.29)
11–14 months	1.9±0.05 (1.5–2.4)	1.1±0.05 (0.6–1.5)	23.1±1.1 (12.6–32)	2.1±0.1 (1.4–2.8)	9.6±0.7 (3–18)	18.3±5.7 (8–32)	41.8±8.8 (18.9–62)	1.67±0.49 (0.82–2.5)	0.93±0.24 (0.59–1.32)
2 years	2±0.2 (1.7–2.4)	1.1±0.1 (0.8–1.3)	23±4.8 (9–29.6)	2±0.4 (1.3–2.8)	9.3±3.4 (3.4–17)	16.9±7 (4.4–32)	41.7±9.8 (19–59.7)	1.87±0.44 (1.20–2.93)	1.01±0.24 (0.66–1.58)
3 years	2.1±0.3 (1.8–2.7)	1.1±0.24 (0.8–1.5)	22.1±4.3 (15.5–31.2)	1.9±0.2 (1.5–2.2)	8±1.9 (5.1–12)	15.3±3.2 (9.3–20.1)	39.1±4.6 (32–46.5)	1.95±0.57 (1.25–2.97)	1.10±0.35 (0.66–1.58)
4 years	2±0.1 (1.5–2.4)	1±0.04 (0.7–1.3)	21.7±4.6 (13–27.2)	1.8±0.3 (1.3–2.3)	7.1±2.1 (3.9–10)	13.4±4.5 (7.3–21.5)	38.1±5.2 (29.9–46.4)	1.73±0.28 (1.17–2.02)	0.95±0.21 (0.57–1.27)
5 years	2±0.3 (1.5–2.7)	0.9±0.2 (0.6–1.2)	18.9±4.4 (12–24.4)	2±0.5 (1.1–3.2)	8.9±5 (2.8–23)	16.7±8.6 (5–40)	40.2±12.6 (19.3–71.4)	1.57±0.49 (1.07–2.89)	0.87±0.25 (0.62–1.58)

	EOAi by Prosthesis size (mm)					
Prosthesis size (mm)	19	21	23	25	27	29
Average EOA (cm ²)	1.1	1.3	1.5	1.8	2.3	2.7
BSA (m ²)						
0.6	1.83	2.17	2.50	3.00	3.83	4.50
0.7	1.57	1.86	2.14	2.57	3.29	3.86
0.8	1.38	1.63	1.88	2.25	2.88	3.38
0.9	1.22	1.44	1.67	2.00	2.56	3.00
1	1.10	1.30	1.50	1.80	2.30	2.70
1.1	1.00	1.18	1.36	1.64	2.09	2.45
1.2	0.92	1.08	1.25	1.50	1.92	2.25
1.3	0.85	1.00	1.15	1.38	1.77	2.08
1.4	0.79	0.93	1.07	1.29	1.64	1.93
1.5	0.73	0.87	1.00	1.20	1.53	1.80
1.6	0.49	0.88	0.88	0.88	0.88	1.69
1.7	0.65	0.76	0.88	1.06	1.35	1.59
1.8	0.61	0.72	0.83	1.00	1.28	1.50
1.9	0.58	0.68	0.79	0.95	1.21	1.42
2	0.55	0.65	0.75	0.90	1.15	1.35
2.1	0.52	0.62	0.71	0.86	1.10	1.29
2.2	0.50	0.59	0.68	0.82	1.05	1.23
2.3	0.48	0.57	0.65	0.78	1.00	1.17
2.4	0.46	0.54	0.63	0.75	0.96	1.13
2.5	0.44	0.52	0.60	0.72	0.92	1.08

Τιμές ωφέλιμων επιφανειών ανάλογα με τον τύπο των βαλβίδων

Table 3 Normal reference values of EOAs* for prosthetic valves

Valve type	Prosthetic valve size (mm)						Reference
	19	21	23	25	27	29	
Stented bioprosthetic valves							
Medtronic Mosaic	1.20	1.22	1.38	1.65	1.80	2.00	6
Hancock II	NA	1.18	1.33	1.46	1.55	1.60	6
Carpentier-Edwards Perimount	1.10	1.30	1.50	1.80	1.80	NA	6
Stentless bioprosthetic valves							
Medtronic Freestyle	1.15	1.35	1.48	2.00	2.32	NA	6
St Jude Medical Toronto SPV	–	1.30	1.50	1.70	2.00	2.50	6
Prima Edwards	0.80	1.10	1.50	1.80	2.30	2.80	6
Mechanical valves							
Medtronic-Hall	1.19	1.34	NA	NA	NA	NA	6
St Jude Medical Standard	1.04	1.38	1.52	2.08	2.65	3.23	6
St Jude Medical Regent	1.60	2.00	2.20	2.50	3.60	4.40	40
MCRI On-X	1.50	1.70	2.00	2.40	3.20	3.20	41
Carbomedics	1.00	1.54	1.63	1.98	2.41	2.63	6
Sorin Bicarbon	NA	1.66	1.96	NA	NA	NA	42

*Expressed as mean values available in the literature.

Normal Effective Orifice Areas for the Most Currently Used Prosthetic Valves

Prosthetic Valve Size (mm)	19	21	23	25	27	29	Reference no.
Stented Bioprosthetic valves							
Medtronic Intact	0.85	1.02 ± 0.10	1.27 ± 0.11	1.40 ± 0.20	1.66 ± 0.16	2.04 ± 0.23	(2)
Medtronic Mosaic	—	1.22 ± 0.27	1.38 ± 0.23	1.65 ± 0.39	1.59 ± 0.33	1.65 ± 0.37	(95)
Hancock II	—	1.18 ± 0.11	1.33 ± 0.16	1.46 ± 0.15	1.55 ± 0.18	1.60 ± 0.15	(3)
Carpentier-Edwards SAV 2650	—	1.16 ± 0.14	—	—	—	—	(96)
Carpentier-Edwards Pericardial 2900	1.10	1.30	1.50	1.80	1.60	—	(97)
Stentless bioprosthetic valves							
Medtronic Freestyle	1.15	1.35 ± 0.21	1.48 ± 0.33	2.00 ± 0.39	2.32 ± 0.48	—	(39)
	1.29 ± 0.19	1.46 ± 0.32	1.79 ± 0.33	2.34 ± 0.69	2.67 ± 0.75	—	(98)
St. Jude Medical Toronto SPV	—	1.30	1.50	1.70	2.00	2.50	(SJM†)
	—	—	1.49 ± 0.45	1.70 ± 0.78	2.12 ± 0.66	2.70 ± 1.03	(99)
Prima Edwards	0.80	1.10	1.50	1.80	2.30	2.80	(100)
Mechanical valves							
Medtronic Hall	1.19 ± 0.21*	1.34 ± 0.15	—	—	—	—	(96)
Carbomedics Standard	1.00 ± 0.40	1.54 ± 0.31	1.63 ± 0.30	1.98 ± 0.41	2.41 ± 0.46	2.63 ± 0.38	(93)
	1.11 ± 0.13	1.52 ± 0.22	1.84 ± 0.25	2.12 ± 0.31	2.65 ± 0.21	—	(14)
St. Jude Medical Standard	—	1.73 ± 0.38	2.13 ± 0.61	—	—	—	(101)
	—	1.76 ± 0.47	2.11 ± 0.63	—	—	—	(26)
	1.04 ± 0.19	1.38 ± 0.22	1.52 ± 0.26	2.08 ± 0.41	2.65 ± 0.58	3.23 ± 0.30	(13)
St. Jude Medical Hemodynamic Plus	1.30 ± 0.30	—	—	—	—	—	(102)
	—	2.01 ± 0.17	—	—	—	—	(101)
	—	2.15 ± 0.29	—	—	—	—	(26)

Normal Reference Values of Effective Orifice Areas for the Prosthetic Valves

	No. of Patients,* %	Prosthetic Valve Size, mm						Reference
		19	21	23	25	27	29	
Stented bioprosthetic valves								
Medtronic Intact	129 (10.2)	0.85	1.02	1.27	1.40	1.66	2.04	2
Medtronic Mosaic	390 (30.8)	1.20	1.22	1.38	1.65	1.80	2.00	23
Hancock II	53 (4.2)	...	1.18	1.33	1.46	1.55	1.60	4
Carpentier-Edwards Perimount	59 (4.7)	1.10	1.30	1.50	1.80	1.80	...	4
St. Jude Medical X-cell	21 (1.7)	...	...	...	...	...	...	...
Stentless bioprosthetic valves								
Medtronic freestyle	368 (29.1)	1.15	1.35	1.48	2.00	2.32	...	4
St Jude Medical Toronto SPV	60 (4.7)	...	1.30	1.50	1.70	2.00	2.50	4
Mechanical valves								
St Jude Medical Standard	151 (11.9)	1.04	1.38	1.52	2.08	2.65	3.23	4
St Jude Medical Regent	13 (1.0)	1.50	2.00	2.40	2.50	3.60	4.80	24
MCRI On-X	18 (1.4)	1.50	1.70	2.00	2.40	3.20	3.20	25
Carbomedics	3 (0.2)	1.00	1.54	1.63	1.98	2.41	2.63	4
Björk Shiley CC	1 (0.1)	...	...	...	...	...	...	...

Effective orifice area is expressed as mean values available in the literature.

*No. of patients with the prosthesis in the present study.

Number and internal orifice diameter of each variety and model of prosthesis in study

Variety and model	Total	17	19	21	23	25	27	29	31
Stented porcine xenografts									
All (No.)	5757	—	196	914	1618	1656	911	369	93
Hancock model 242									
No.	1076	—	8	45	142	260	377	193	51
Orifice (mm)			16.3	18.3	20.2	22.1	22.9	24.7	26.5
Hancock model 250									
No.	862	—	56	205	295	306	0	0	0
Orifice (mm)			16.3	18.3	20.2	22.1			
Carpentier-Edwards model 2625									
No.	2166	—	50	324	680	683	293	101	35
Orifice (mm)			17	19	21	23	25	27	29
Carpentier-Edwards SAV model 2650									
No.	1653	—	82	340	501	407	241	75	7
Orifice (mm)			17	19	21	23	25	27	29
Stented bovine pericardial bioprostheses									
Carpentier-Edwards PERIMOUNT									
No.	3198	—	533	1030	969	498	152	16	0
Orifice (mm)			18	20	22	24	26	28	—
Mechanical prostheses									
All (No.)	3583	7	340	922*	1107†	757	325	103	22
St Jude Medical, Standard model A-101									
No.	1992	—	297	466	583	388	174	64	20
Orifice (mm)			14.7	16.7	18.5	20.4	22.3	24.1	26.0
St Jude Medical, Hemodynamic Plus model AHP-105									
No.	133	7	43	67	13	3	—	—	—
Orifice (mm)			16.7	18.5	20.4	22.3			
Medtronic Hall model A7700									
No.	1055	—	—	361*	363†	225	80	25	1
Orifice (mm)				16	18	20	22	24	24
Sorin									
No.	403	—	—	28	148	141	71	14	1
Orifice (mm)				16	18	20	22	24	24
Allografts‡ (No.)	721	3	17	67	171	47	12	4	0

*Of which 136 were labeled size 20 Medtronic Hall prostheses with internal orifice diameter identical to size 21 prostheses.

†Of which 35 were labeled size 22 Medtronic Hall prostheses with internal orifice diameter identical to size 23 prostheses.

‡Additional allograft sizes, which are internal orifice diameters, are as follows: 15 (n = 2), 18 (n = 11), 20 (n = 51), 22 (n = 140), 24 (n = 165), 26 (n = 25), 28 (n = 3), and 30 (n = 2).

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ΣΥΜΠΕΡΑΣΜΑΤΙΚΑ

- Η αναντιστοιχία ασθενούς/Βαλβίδος είναι μια υπαρκτή οντότητα που πρέπει να μας απασχολεί γιατί επηρεάζει τα άμεσα και απώτερα αποτελέσματα των επεμβάσεων .
- Αποφεύγεται με τη κατάλληλη προεγχειρητική μελέτη του ασθενούς, τη χρήση νεότερης γενεάς βαλβίδων και σπάνια με χειρουργικές τεχνικές διεύρυνσης του δακτυλίου (της Αορτικής).

ΕΥΧΑΡΙΣΤΩ

