EMOCLINIC SYMPOSIUM
SULLE SPONDE DEL TICINO

"Cardiologia ieri, oggi e domani"

Valvuloplastica aortica: a bridge to……

Novara, 7-8 giugno 2018

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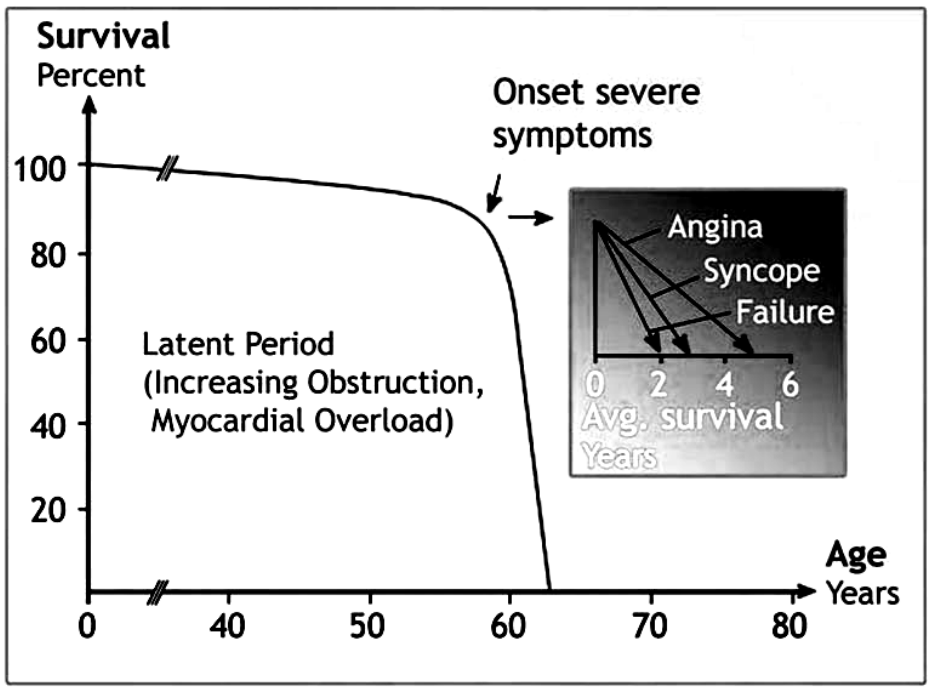
Emodinamica Ospedale di Asti

STENOSI AORTICA

- **La valvulopatia acquisita più frequente nella popolazione industrializzata (34% in Euro Heart Survey)**
- **Prevalenza nella popolazione anziana 2-9% nei diversi studi**
- **La forma più rappresentata è quella degenerativa-calcifica (processo degenerativo- infiammatorio presente nella metà dei soggetti sopra 80 anni)**

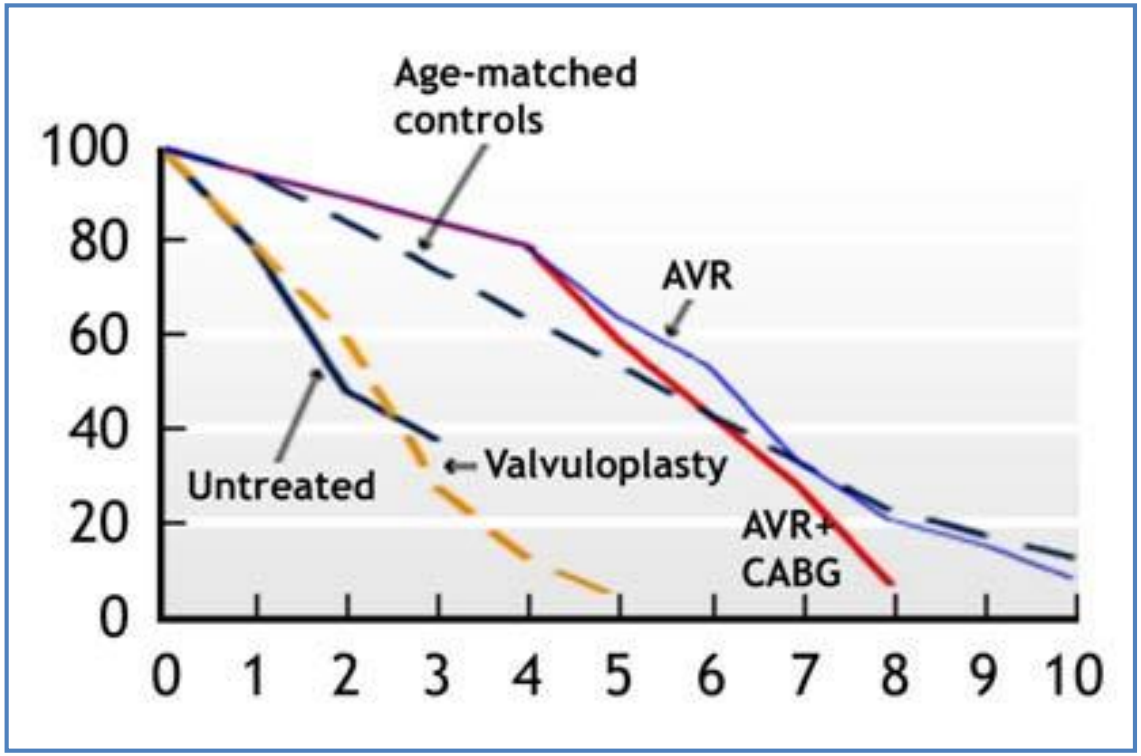
Stenosi aortica degenerativa

Insorgenza dei sintomi



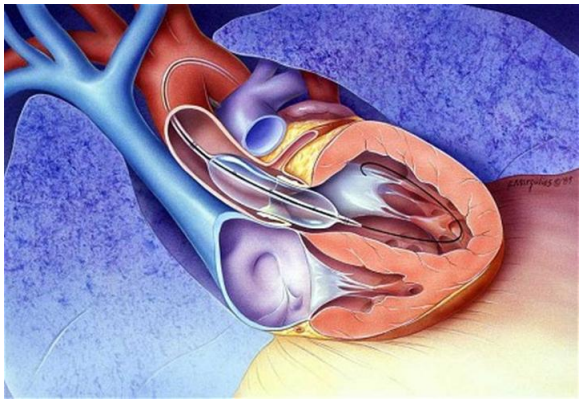
La sopravvivenza dopo l'insorgenza dei sintomi è del 50% a 2 anni e del 20% a 5 anni

Sopravvivenza ottuagenari con stenosi aortica



L'intervento chirurgico dovrebbe essere eseguito prontamente all'insorgenza del sintomo

Balloon Aortic Valvuloplasty (BAV)

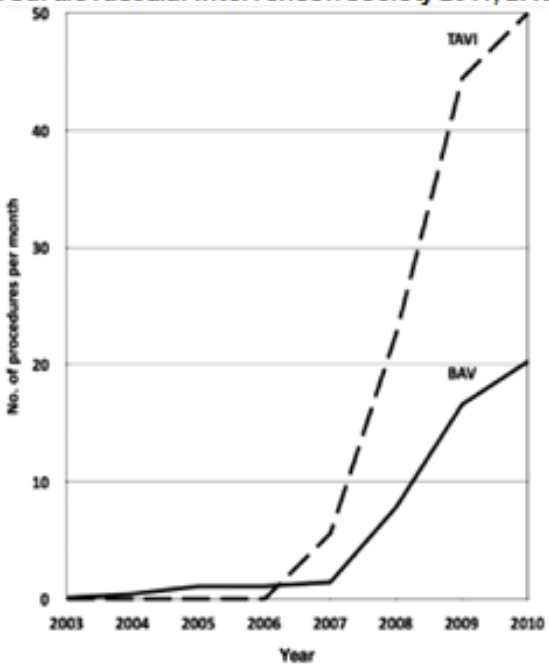


- **Nata negli anni ottanta per le stenosi congenite nei bambini (Lababidi 1984)**
- **Utilizzata successivamente negli adulti con SA severa ed elevato rischio chirurgico (Cribier 1986)**
- **Successivamente abbandonata per alto tasso di complicanze (vascolari e cerebrali), la restenosi precoce e l'assenza di beneficio sulla mortalità rispetto alla sola terapia medica**

1. **Frattura dei depositi calcifici dei lembi valvolari**
2. **Separazione commissure fuse**
3. **Stretching tessuto valvolare**

“Rinascita” BAV con la nascita della TAVI (Cribier 2002)

Number of balloon aortic valvuloplasty and TAVI procedures in the UK—the increase in stand-alone BAV mirrors the increase in TAVI (TAVI data from the 25 UK centres with TAVI programmes—British Cardiovascular Intervention Society 2011; BAV data from 14 study...

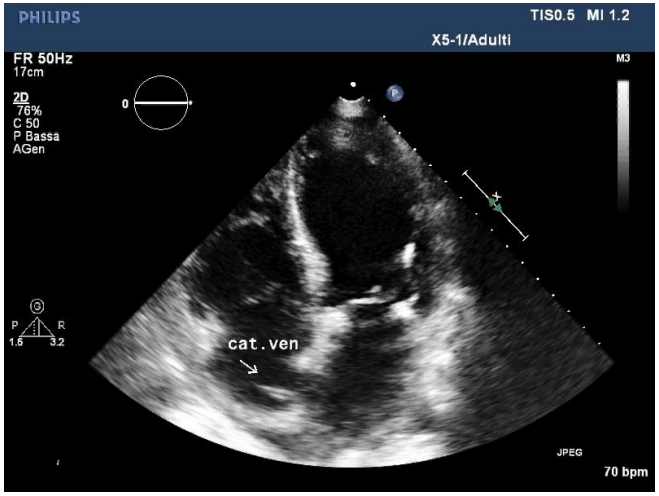


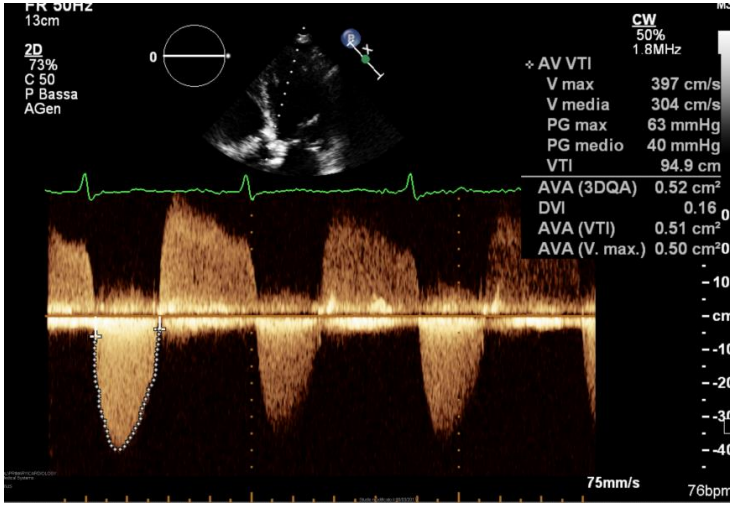
Thomas R Keeble et al. Open Heart 2016;3:e000421

openheart

CASO CLINICO

- **L.G, donna di 82 anni**
- **Diabete tipo 2, ipertensione arteriosa, IRC in trattamento dialitico bisettimanale dal 2015, BPCO**
- **CAD cronica, pregresso IMA anteriore (2016), occlusione IVA periapicale e nota occlusione cronica CDX, SA moderata ed EF lievemente ridotta**
- **3/2017 ricovero per scompenso cardiaco**
- **ECOTT: EF 35%, valvola aortica calcifica con SA severa (grad 63/40 mmHg, AVA 0,52 cmq), IAo moderata, IM moderata**





Cosa fare?

a) SAVR
b) TAVI
c) Eco-dobutamina (valutare riserva contrattile e beneficio della TAVI/SAVR)
d) BAV come bridge a TAVI/SAVR o terapia medica

Valvular Heart Disease

Relation of Preprocedural Assessment of Myocardial Contractility Reserve on Outcomes of Aortic Stenosis Patients With Impaired Left Ventricular Function Undergoing Transcatheter Aortic Valve Implantation

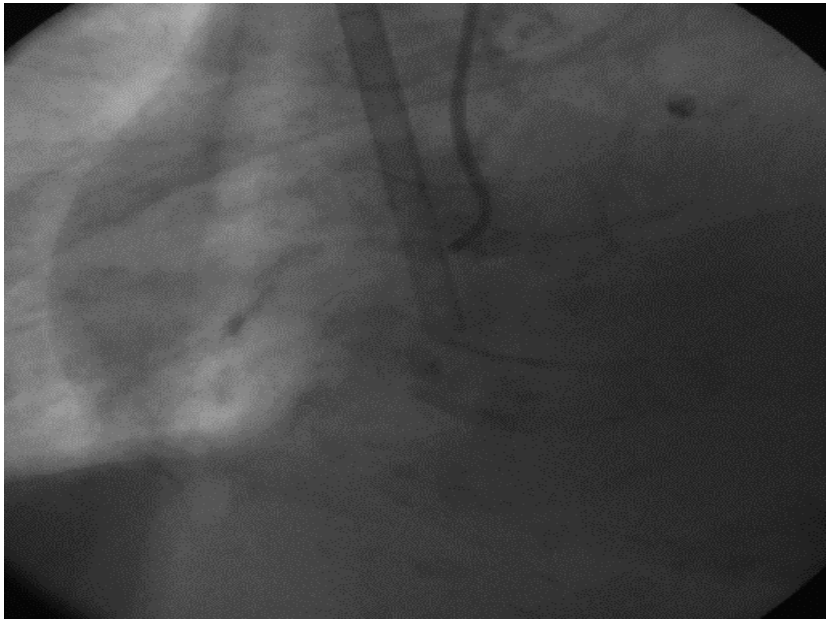
Israel M. Barbash MD, Sa'ar Minha MD, Itsik Ben-Dor MD, Danny Dvir MD, Marco A. Magalhaes MD, Rebecca Torguson MPH, Petros Okubagzi MD, Lowell F. Satler MD, Augusto D. Pichard MD, Ron Waksman MD

Interventional Cardiology, MedStar Washington Hospital Center, Washington, DC

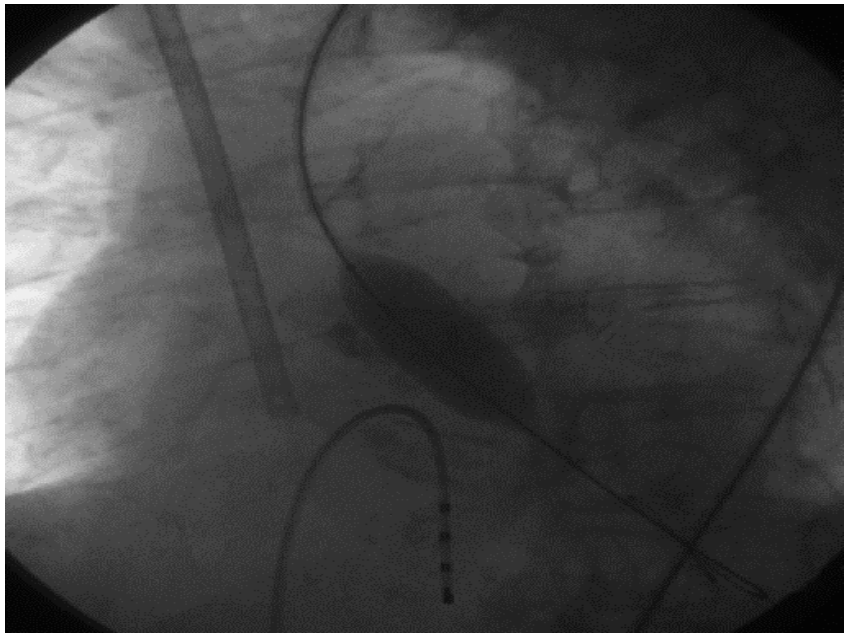
- **99 pz con SA severa e EF< 45% inviati a TAVI**
- **Il recupero EF post-BAV è maggior predittore di miglioramento EF post-TAVI**
- **Sia l'eco-dobutamina che la BAV forniscono dati complementari per quanto concerne il recupero di EF e la mortalità sia periprocedurale che tardiva post-TAVI**

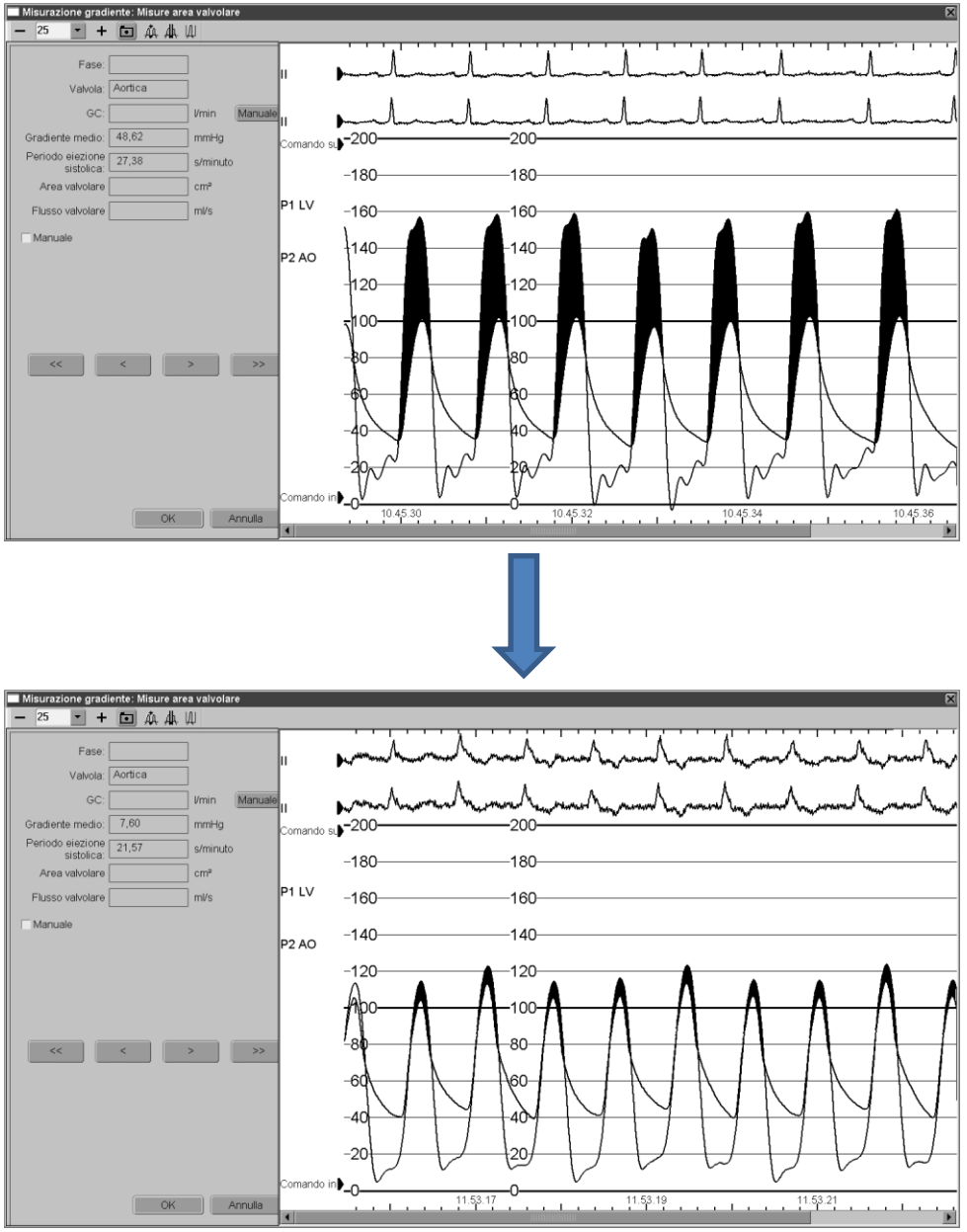
Am J Cardiol. 2014 May 1;113(9):1536-42

- **Discusso il caso in Heart Team**
- **Per la presenza di comorbidità importanti, EF compromessa e coesistente IM moderata => BAV come primo approccio per valutare la presenza di riserva contrattile e miglioramento della sintomatologia**



Eseguita BAV con Crystal 20/40 mm



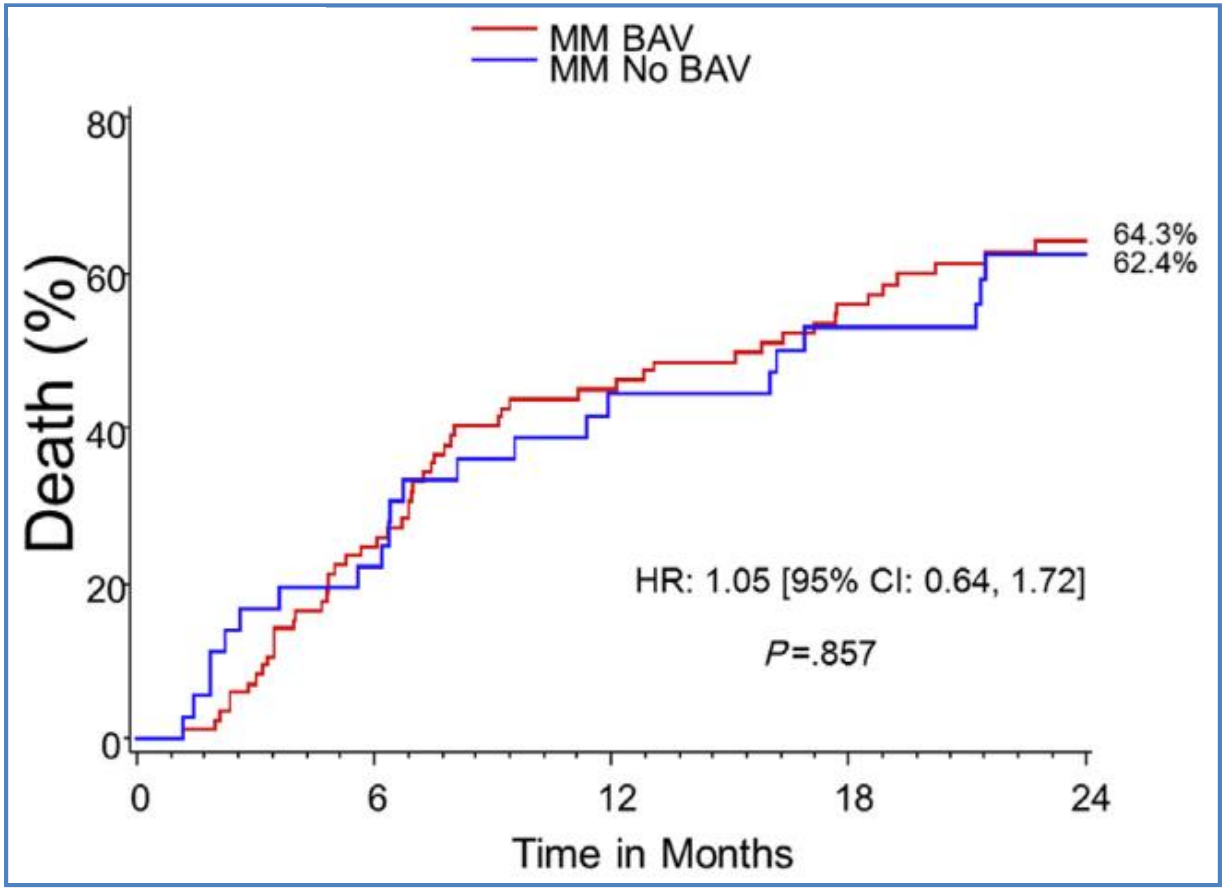


Quali indicazioni correnti alla BAV?

- Durante procedura TAVI
- Bridge to SAVR
- Bridge to TAVR
- Bridge to “decision”
- BAV palliativa
- Pre-operatoria nella chirurgia non cardiaca

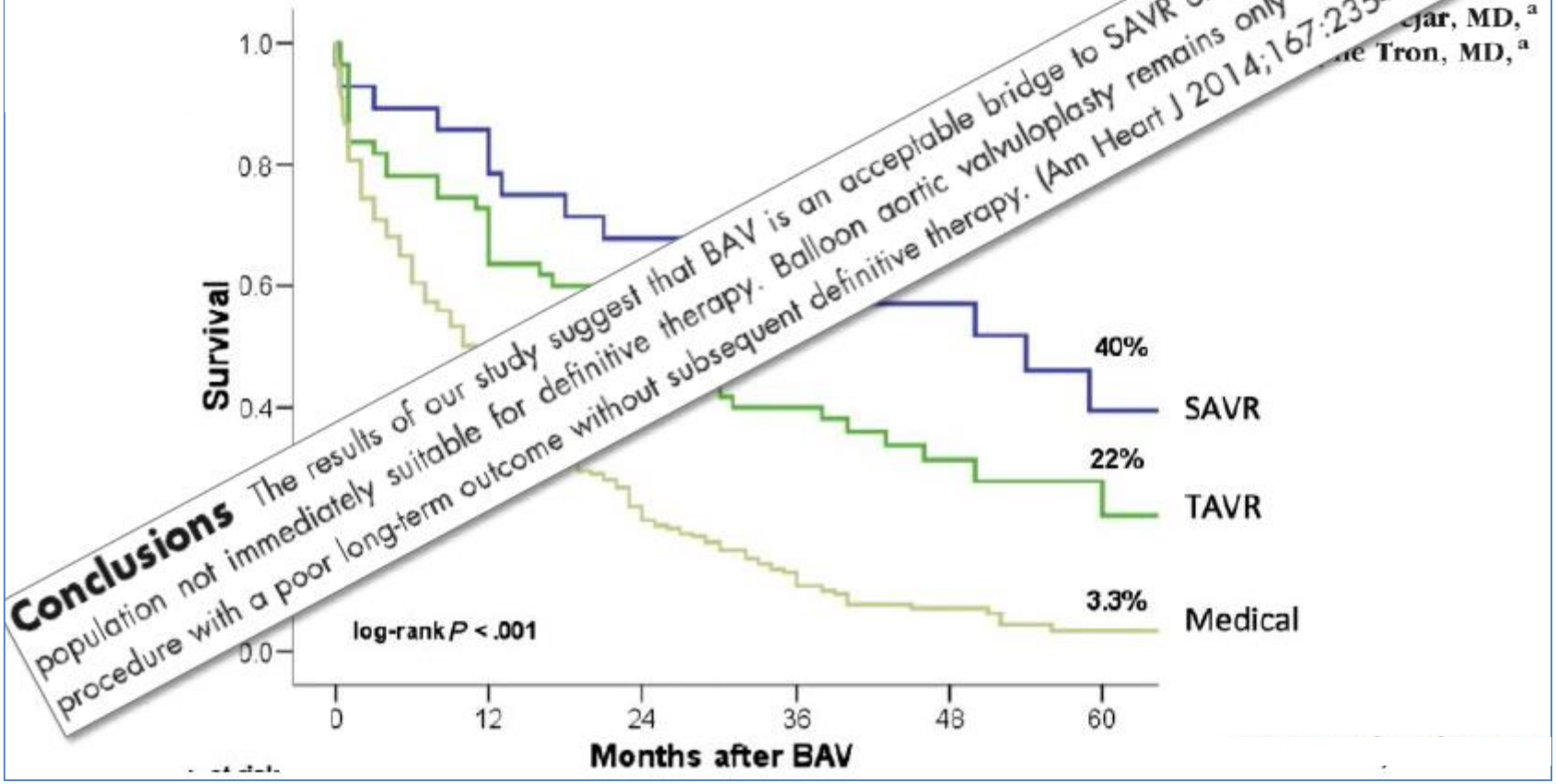
Non come alternativa a medio-lungo termine alla SAVR/TAVR!

Hemodynamic Outcomes of Transcatheter Aortic Valve Replacement and Medical Management in Severe, Inoperable Aortic Stenosis: A Longitudinal Echocardiographic Study of Cohort B of the PARTNER Trial



J Am Soc Echocardiogr 2015; P.S. Douglas et al.

Balloon aortic valvuloplasty in the era of transcatheter aortic valve replacement: Acute and long-term outcomes



Conclusions The results of our study suggest that BAV is an acceptable bridge to SAVR or TAVR in a very high-risk population not immediately suitable for definitive therapy. Balloon aortic valvuloplasty remains only a brief temporizing procedure with a poor long-term outcome without subsequent definitive therapy. (Am Heart J 2014;167:235-40.)

...jar, MD, [a]
...ne Tron, MD, [a]

Am Heart Journal; Feb 2014; H. Eltchaninoff et al.

BAV come mezzo diagnostico:" bridge to decision"

- In pazienti "borderline" con EF compromessa, insufficienza mitralica moderato-severa
- Patologie polmonari ostruttive croniche
- Comorbidità avanzate (IRC, ipertensione polmonare, necessità chirurgia non cardiaca urgente)
- Pazienti fragili

Per valutare la risposta terapeutica alla riduzione del gradiente valvolare transaortico e quindi l'eventuale beneficio di un intervento definitivo di sostituzione valvolare aortica chirurgica o TAVI.

Balloon aortic valvuloplasty as a bridge-to-decision in high risk patients with aortic stenosis: a new paradigm for the heart team decision making

Francesco Saia, Carolina Moretti, Gianni Dall'Ara, Cristina Ciuca, Nevio Taglieri, Alessandra Berardini, Pamela Gallo, Marina Cannizzo, Matteo Chiarabelli, Niccolò Ramponi, Linda Taffani, Maria Letizia Bacchi-Reggiani, Cinzia Marrozzini, Claudio Rapezzi, Antonio Marzocchi

Cardio-Thoraco-Vascular Department, University Hospital of Bologna, Bologna, Italy

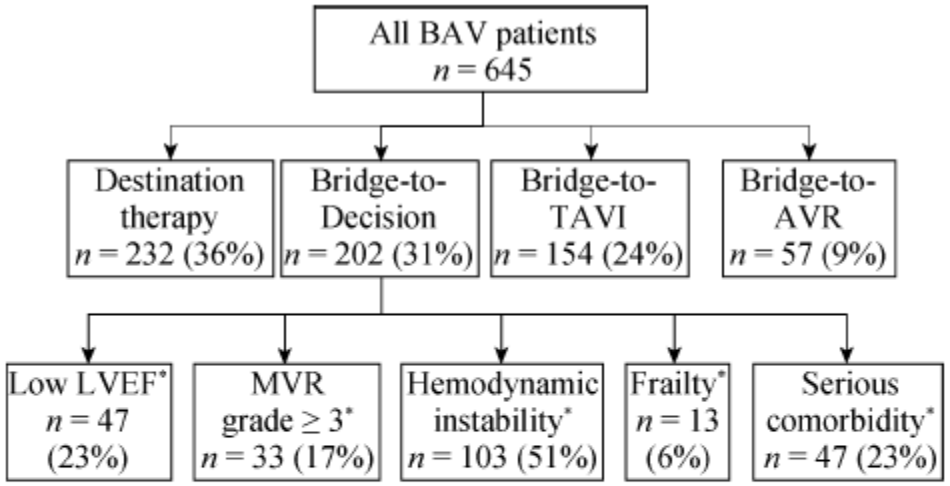


Figure 1. Study flow. Selection and classification of patients who underwent BAV as bridge-to-decision. AVR: aortic valve replacement; BAV: balloon aortic valvuloplasty; LVEF: left ventricular ejection fraction; MVR: mitral valve regurgitation; TAVI: transcatheter aortic valve implantation. *Forty-one patients presents > 1 conditions.

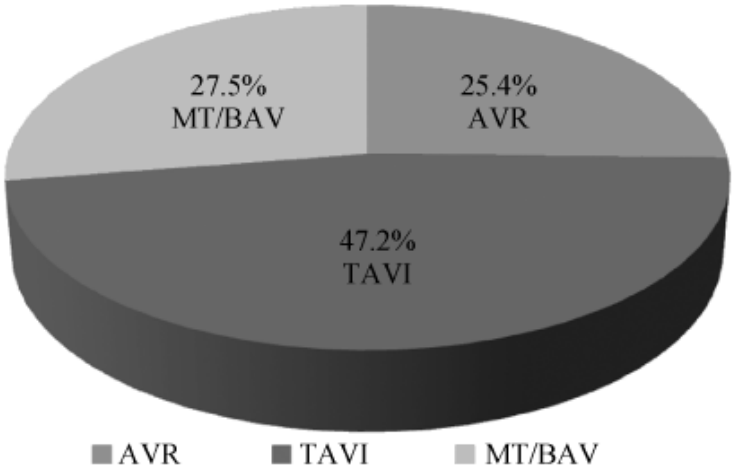


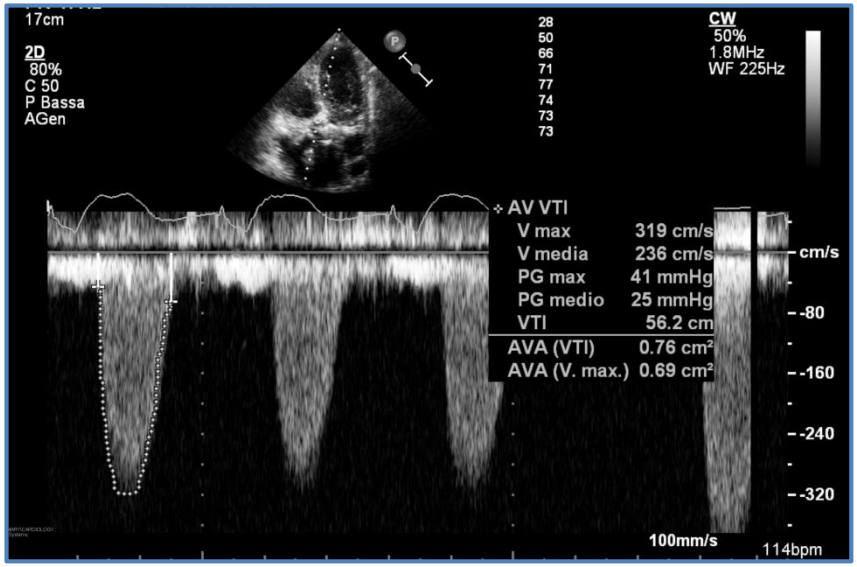
Figure 4. Effect of bridge-to-decision BAV on decision making in the whole study population. Outcome of the second heart team evaluation in patients who underwent bridge-to-decision BAV. AVR: aortic valve replacement; BAV: balloon aortic valvuloplasty; MT/BAV: medical treatment/repeated balloon aortic valvuloplasty; TAVI: transcatheter aortic valve implantation.

Table 3. In-hospital outcome.

	All patients
Death	9 (4.5%)
Cardiac	8 (4.0%)
Non cardiac	1 (0.5%)
Acute myocardial infarction	0
Cerebrovascular accident	2 (1.0%)
Transient ischemic attack	0
Stroke	2 (1.0%)
Disabling	1 (0.5%)
Non disabling	1 (0.5%)
Vascular complications	8 (4.0%)
Major	1 (0.5%)
Minor	7 (3.5%)
Vascular complication description	
Access-site hematoma	5 (2.5%)
Retroperitoneal hematoma	0
Artero-venous fistula	0
Femoral dissection	1 (0.5%)
Femoral pseudo-aneurysm	2 (1.0%)
Thrombosis	0
Acute aortic regurgitation	2 (1.0%)

Data are presented as *n* (%).

- **Nel decorso successivo comparsa alla telemetria di lembi di BAV 2:1 (già noti dall'ingresso episodi di BAV II tipo 1 senza pause patologiche)=> impianto PM definitivo VDD**
- **Visita ambulatoriale ad un mese: paziente asintomatica**
- **ECO TT ad un mese: EF 45%, gradiente aortico 40/25 mmHg, AVA 0.76cmq, IM lieve**



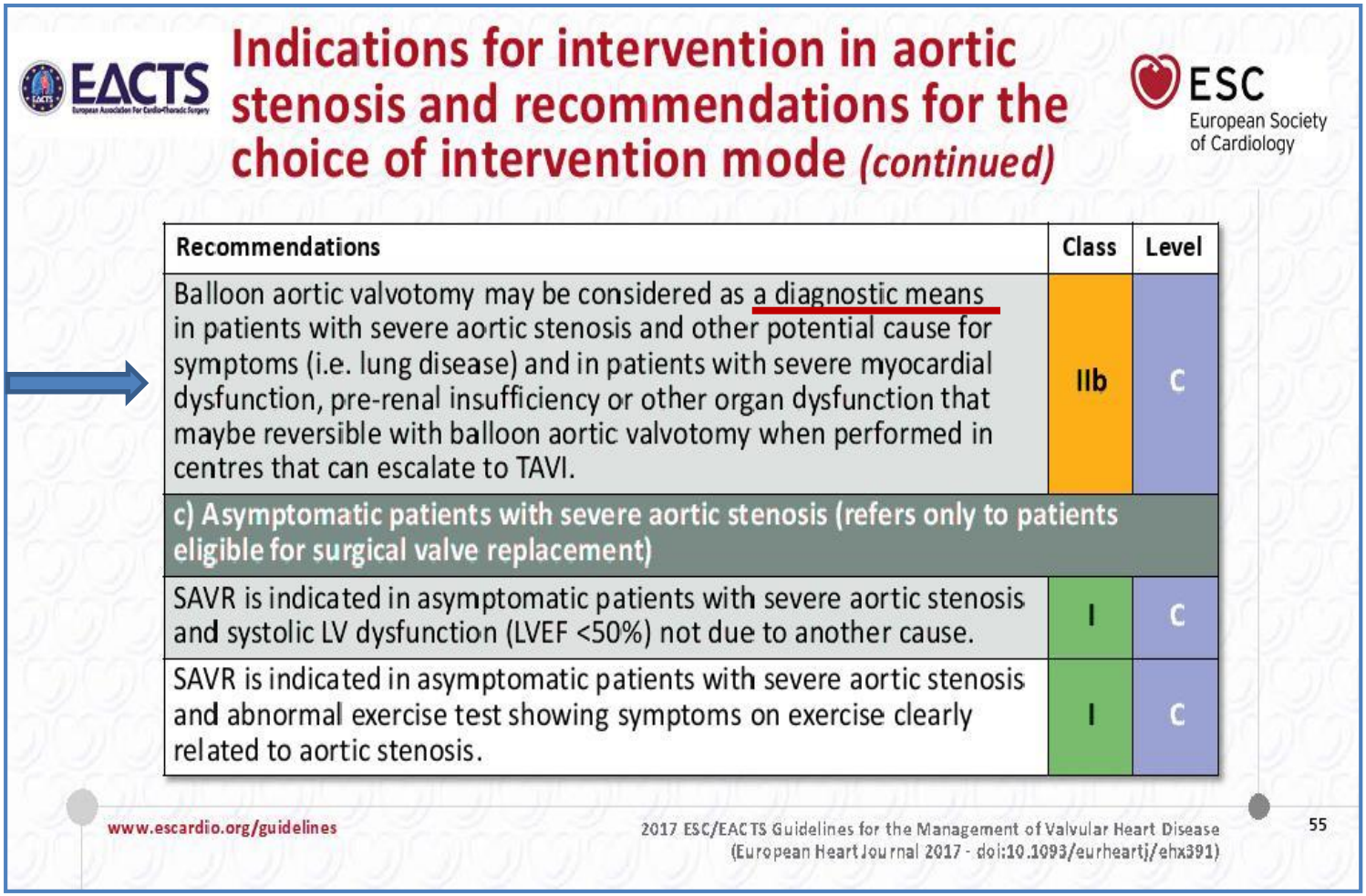
Paziente inviata a procedura di TAVI!

Indicazioni BAV nelle correnti linee guida

Indications for intervention in aortic stenosis and recommendations for the choice of intervention mode *(continued)*

Recommendations	Class	Level
In patients who are at increased surgical risk (STS or EuroSCORE II ≥4% or logistic EuroSCORE I ≥10% or other risk factors not included in these scores such as frailty, porcelain aorta, sequelae of chest radiation), the decision between SAVR and TAVI should be made by the Heart Team according to the individual patient characteristics (see according table), with TAVI being favoured in elderly patients suitable for transfemoral access.	I	B
Balloon aortic valvotomy may be considered as a bridge to SAVR or TAVI in haemodynamically unstable patients or in patients with symptomatic severe aortic stenosis who require urgent major non-cardiac surgery.	IIb	C

Indicazioni BAV nelle correnti linee guida



EACTS

Indications for intervention in aortic stenosis and recommendations for the choice of intervention mode *(continued)*

ESC European Society of Cardiology

Recommendations	Class	Level
Balloon aortic valvotomy may be considered as a diagnostic means in patients with severe aortic stenosis and other potential cause for symptoms (i.e. lung disease) and in patients with severe myocardial dysfunction, pre-renal insufficiency or other organ dysfunction that maybe reversible with balloon aortic valvotomy when performed in centres that can escalate to TAVI.	IIb	C
c) Asymptomatic patients with severe aortic stenosis (refers only to patients eligible for surgical valve replacement)		
SAVR is indicated in asymptomatic patients with severe aortic stenosis and systolic LV dysfunction (LVEF <50%) not due to another cause.	I	C
SAVR is indicated in asymptomatic patients with severe aortic stenosis and abnormal exercise test showing symptoms on exercise clearly related to aortic stenosis.	I	C

www.escardio.org/guidelines

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)

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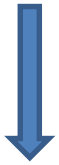
BAV nell'era TAVI

- **Miglioramenti tecnologici (palloni con differenti caratteristiche e profili, riduzione Fr introduttori, device chiusura vascolare)**
- **Utilizzo rapid pacing (permette posizionamento più stabile del pallone, la riduzione del rischio di embolizzazione di calcio e di danno alla radice aortica)**
- **Migliore selezione del paziente**



Migliori outcomes procedurali e una riduzione delle complicanze

Table 3. Comparison of hemodynamic outcomes and procedural complications among patients who underwent balloon aortic valvuloplasty in the early/pre-transcatheter aortic valve replacement (TAVR) and contemporary/TAVR eras.

Study Parameter	N	Overall	Early BAV Experience	Contemporary BAV Experience	*P*-Value
BAV outcomes					
Pre-peak transaortic valve gradient (mm Hg)	2544	67.9 ± 27.0	68.0 ± 27.4	67.7 ± 26.6	<.05*
Post-peak transaortic valve gradient (mm Hg)		34.4 ± 18.0	31.0 ± 17.8	39.4 ± 18.3	<.05*
Pre-mean transaortic valve gradient (mm Hg)	3610	50.3 ± 20.3	51.6 ± 19.4	49.1 ± 21.1	<.05*
Post-mean transaortic valve gradient (mm Hg)		24.6 ± 13.0	24.7 ± 12.1	24.5 ± 13.7	<.05*
Pre-aortic valve area (cm^2)	3999	0.6 ± 0.2	0.6 ± 0.2	0.6 ± 0.2	<.05*
Post-aortic valve area (cm^2)		1.0 ± 0.3	1.0 ± 0.3	0.9 ± 0.3	<.05*
Pre-cardiac output (L/min)	2315	4.1 ± 1.3	4.1 ± 1.3	4.3 ± 1.3	<.05*
Post-cardiac output (L/min)		4.5 ± 1.6	4.6 ± 1.6	4.4 ± 1.5	<.05*
Pre-systolic blood pressure (mm Hg)	1481	122.4 ± 27.8	122.0 ± 25.7	123.0 ± 30.9	<.05*
Post-systolic blood pressure (mm Hg)		128.5 ± 28.2	125.2 ± 26.5	133.6 ± 30.6	<.05*
BAV complications					
Procedural death	3913	2.2%	2.9%	1.5%	<.01
In-hospital mortality	2420	7.1%	8.5%	4.6%	<.01
Major vascular complications	3548	7.0%	10.2%	4.0%	<.01
Myocardial infarction	3201	0.8%	0.8%	0.7%	.73
Stroke	3483	1.1%	1.2%	1.1%	.91
Severe aortic insufficiency	3106	1.1%	1.1%	1.1%	.94
Cardiac tamponade	3201	0.9%	0.8%	0.9%	.85

*P<.05 for all comparisons between pre-BAV and post-BAV hemodynamic outcomes at all investigated time points (overall, early/pre-TAVR era, and contemporary/TAVR era. BAV = balloon aortic valvuloplasty; TAVR = transcatheter aortic valve replacement.

J Invasive Cardiology; Kumar et al - 2016

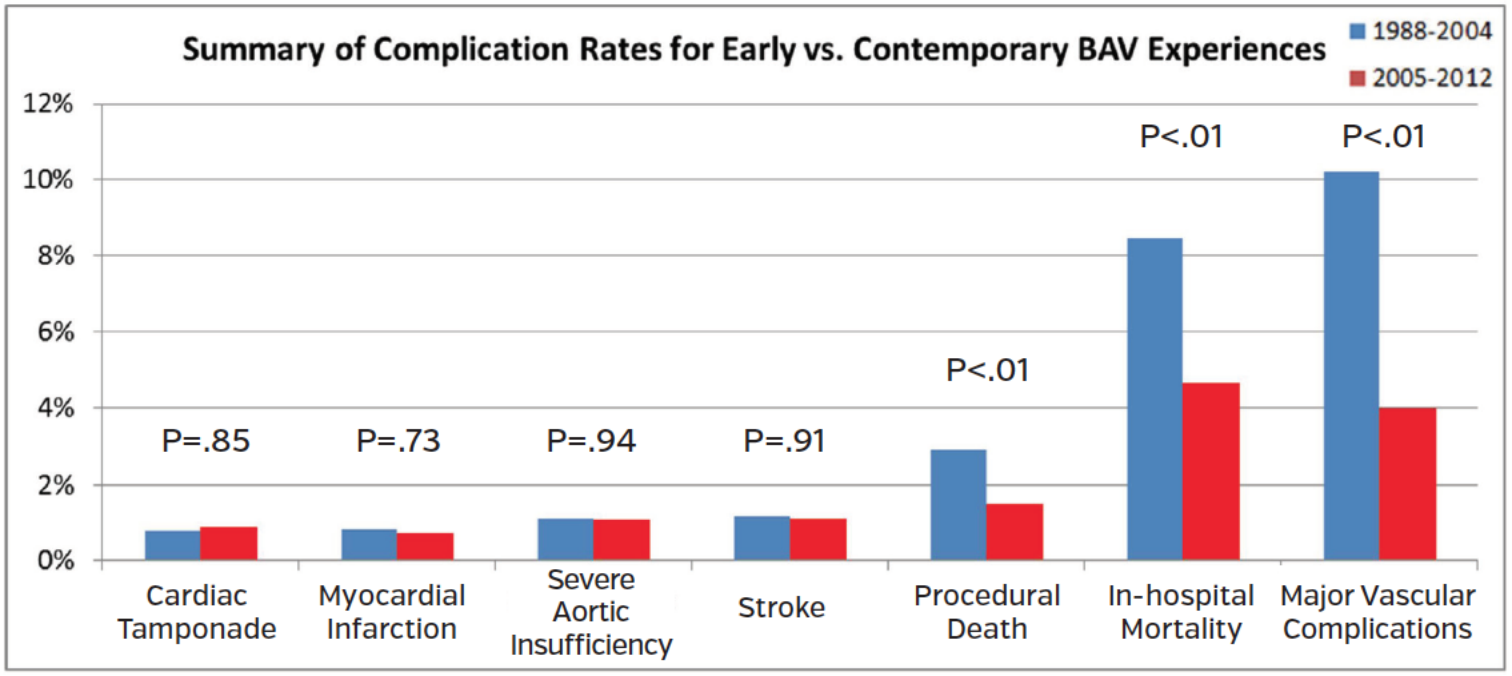


FIGURE 5. Comparison of balloon aortic valvuloplasty (BAV) complication rates in the early/pre-transcatheter aortic valve replacement (TAVR) and contemporary/TAVR eras.

J Invasive Cardiology; Kumar et al - 2016

Conclusioni

- **Rinascita della BAV nell'era TAVI (Cl II b nelle attuali Linee Guida)**
- **Non come terapia definitiva ma come bridge a SAVR/TAVR in pazienti ad alto rischio o in cui il beneficio reale di questi interventi sia incerto**
- **Come terapia definitiva solo a scopo palliativo**
- **Riduzione progressiva negli anni della mortalità intra-procedurale e intra-ospedaliera e delle complicanze vascolari**


GRAZIE PER L'ATTENZIONE