



Academy



Pericardial Patches in Aortic Repair- A Critical Perspective

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Need for Patch in AV Repair

Acquired Aortic Valvular Disease

- Partial cusp replacement after excision of calcification
- Augmentation for retraction
- Fenestrations
- Perforations

Congenital AV Malformation

- UAV

Requirements for Patches in Cusp Repair

Early

- Inert
- Non-thrombogenic
- Flexible
- Healing-in

Late

- Durability
- No dehiscence
- No calcification

Patch Material

- **Autologous: non treated or glutaraldehyde-treated pericardium**
- **Heterologous: pericardium**
 - Bovine
 - Equine
 - Glutaraldehyde- fixed
 - Decellularized
- **Synthetic: Polytetrafluoroethylene (PTFE)**

Synthetic Material

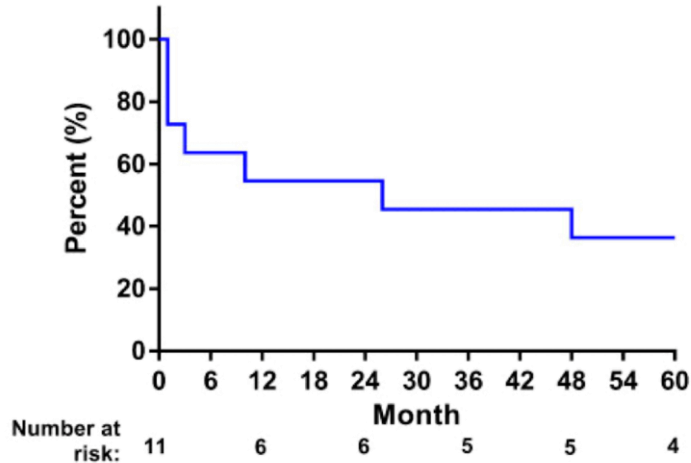
Mid-term durability of polytetrafluoroethylene patches in unicuspid aortic valve repair

Irem Karliova ^{a,*}, Tristan Ehrlich^a, Shunsuke Matsushima ^a, Sebastian Ewen^b and Hans-Joachim Schäfers ^a

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Freedom from reoperation



**Dehiscence !
No healing-in**

Biologic: Autologous vs. Heterologous Which Material?

In summary, we present here a series of aortic valve reconstructions in a relatively young patient cohort with mostly rheumatic etiology. Bovine pericardium and glutaraldehyde-treated autologous pericardium were utilized.

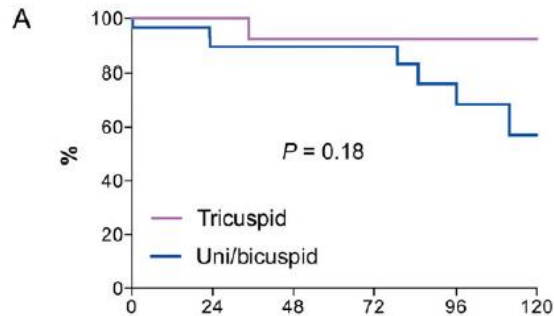
After 16 years of close follow-up, we conclude that (1) the hemodynamic performance is excellent, (2) the long-term results are acceptable and comparable at least to stentless aortic valve replacement (if not better) considering the longer follow-up and the younger patients, (3) either bovine or autologous pericardium can be utilized in the technique. Autologous pericardium, however, is readily available and inexpensive, but if not available we should not hesitate to use bovine pericardium.

Biologic: Autologous vs. Heterologous Which Material?

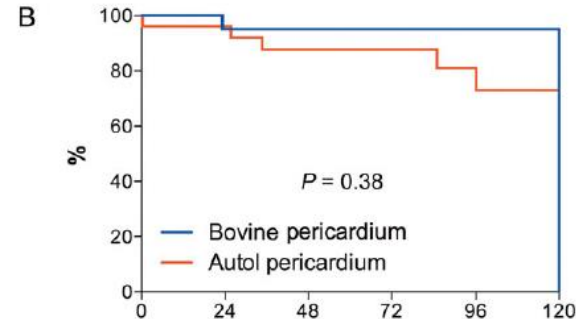
Aortic valve repair with patch in **non-rheumatic** disease: indication, techniques and durability[†]

Zahra Mosala Nezhad^a, Laurent de Kerchove^a, Jawad Hechadi^a, Saadallah Tamer^a, Munir Boodhwani^b,
Alain Poncelet^a, Philippe Noirhomme^a, Jean Rubay^a and Gebrine El Khoury^{a,*}

European Journal of Cardio-Thoracic Surgery 46 (2014) 997-1005



Patients at risk	Months					
	0	24	48	72	96	120
TAV	20	15	10	8	5	2
BAV	30	26	22	15	11	3



Patients at risk	Months					
	0	24	48	72	96	120
Bov Peric	25	20	9	3	2	2
Autol Peric	26	24	22	16	11	3

Decellularized
bovine patch

Influence of valve morphology on repair durability!

HOM Experience 2000-2017

Results of Pericardial Patches in Tricuspid and Bicuspid Aortic Cusp Repair

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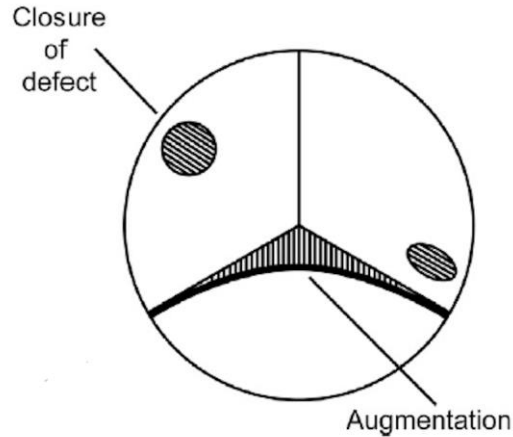
(Ann. Thorac. Surg. 2019)

- n= 275 (♂: 238, 86.5%)
- TAV = 139; BAV= 136
- Age 53 ± 14 yrs
- Isolated AVR 212 (77,1%)
- Root remodeling 63 (22.9%)

Use of Pericardial Patches TAV (n=140)

TAV

Pathology
Fenestration n=80
Defect n=31
Retraction n=26
Calcification n=3

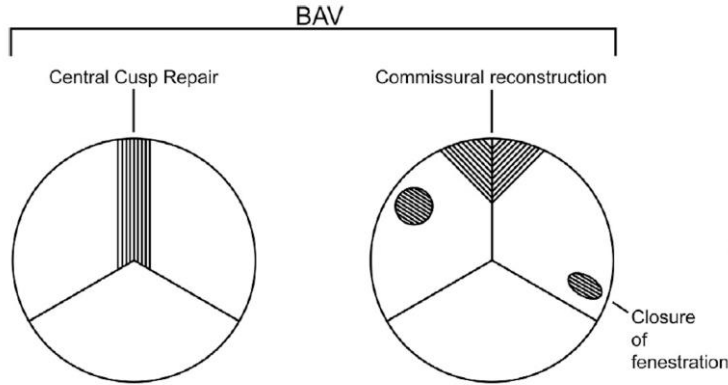


Repair Technique
Closure of fenestration n=80
Closure of defect n=34
Augmentation n=26

Use of Pericardial Patches

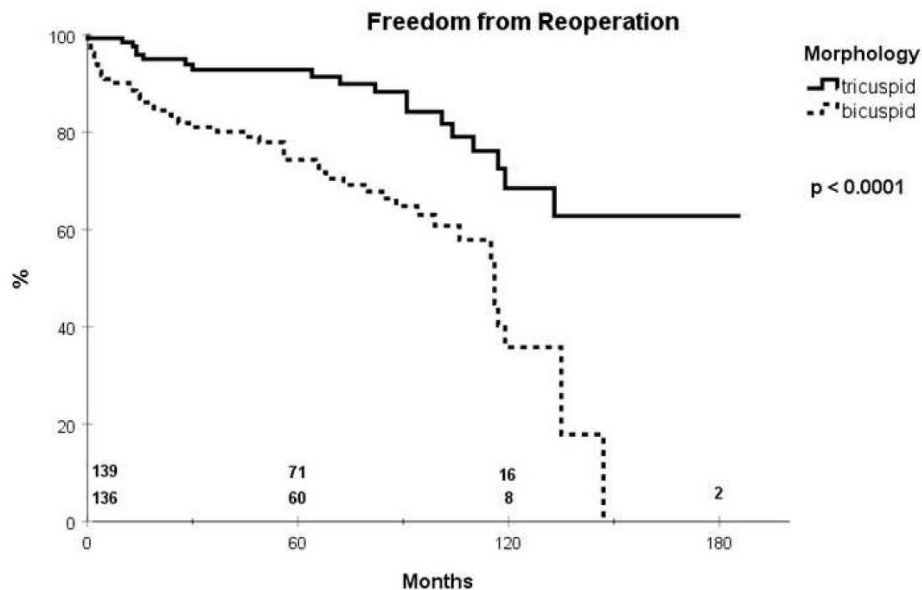
BAV (n=136)

Pathology
Calcification n=61
Fenestration n=32
Defect n=22
Retraction n=17
Anomaly n=4



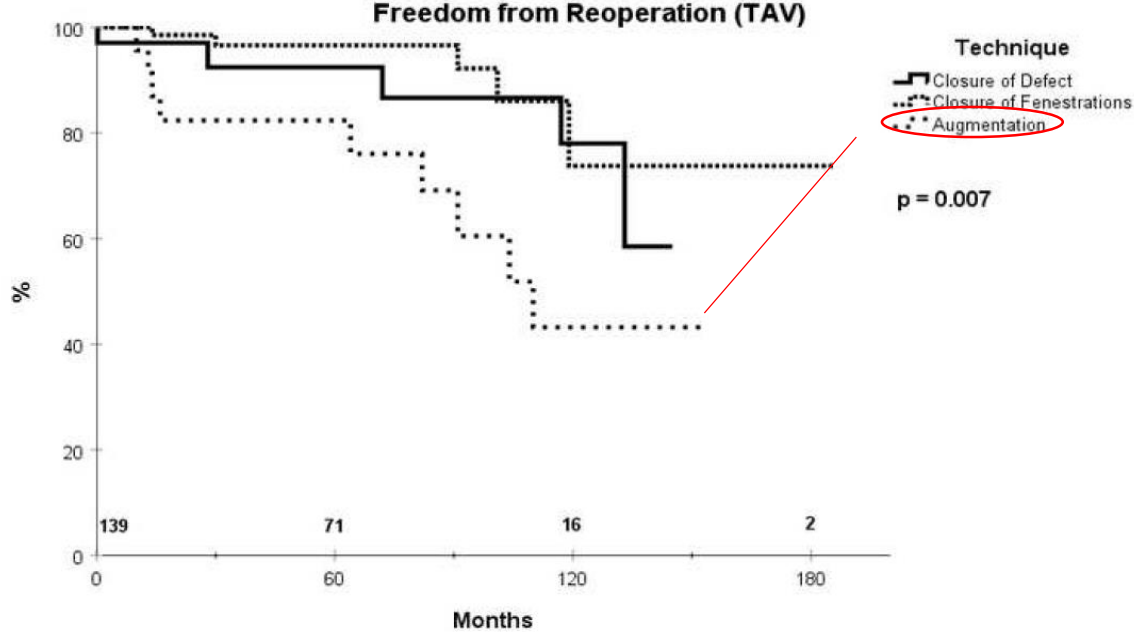
Repair Technique
Central cusp replacement n=64
Commissural reconstruction n=25
Closure of fenestration n=24
Closure of defect n=21
Augmentation n=2

Pericardial Patches – Influence of AV Morphology (TAV vs BAV)

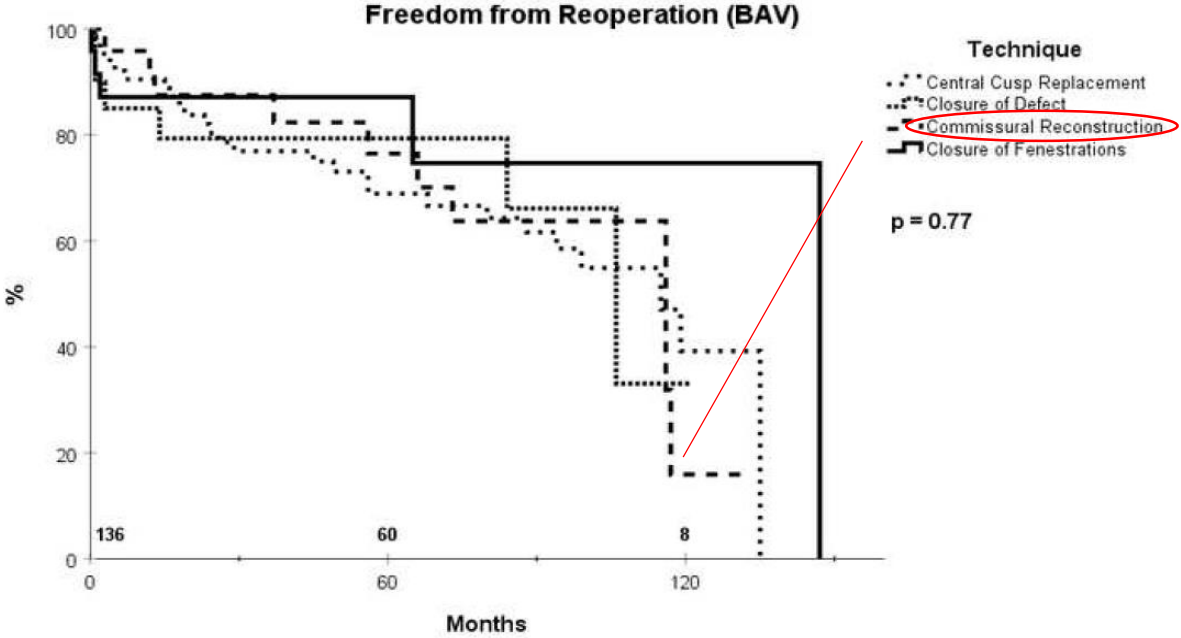


Durability depends on morphology

Results of Pericardial Patches TAV Repair



Results of Pericardial Patches BAV Repair



Results of Pericardial Patches BAV Repair

TABLE 2. Competing risks regression models

	Crude model			Adjusted model		
	Subdistributional HR	<i>P</i> value	95% CI	Subdistributional HR	<i>P</i> value	95% CI
Effective height measurement†	1.62	.240	0.73-3.63	1.23	.680	0.46-3.27
Aneurysm‡	0.49	.083	0.22-1.10	0.53	.130	0.24-1.20
Graft size§ (24 mm)	1.14	.760	0.49-2.65	1.22	.670	0.49-3.03
Graft size§ (28 mm)	1.58	.480	0.44-5.72	1.34	.690	0.32-5.65
Degree of fusion	0.59	.220	0.25-1.39	0.38	.034	0.15-0.93
Calcification¶	2.31	.030	1.08-4.94	4.34	.002	1.69-11.16
Pericardial Patch#	5.17	<.001	2.28-11.7	4.00	.002	1.65-9.66
Annuloplasty**	1.55	.300	0.68-3.52	1.21	.680	0.49-2.97

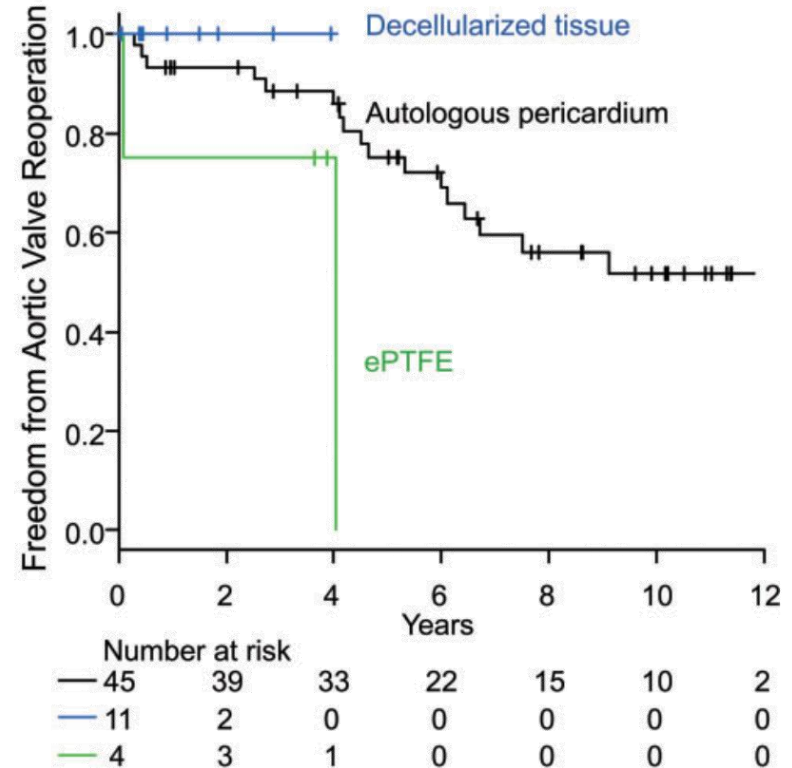
Competing Risks Regression Models (adjusted for age, calcification* [no/yes], degree of fusion* [no/yes], sex [male/female]). *Only when not considered as investigated independent variable. Bold values indicate statistical significance. *HR*, Hazard ratio; *CI*, confidence interval. †Reference group: no effective height measurement. ‡Reference group: AR. §Reference group: graft size (26 mm). ||Reference group: partial. ¶Reference group: no calcification. #Reference group: no pericardial patch. **Reference group: no annu-

Results of Pericardial Patches UAV Repair

Unicuspid aortic valve repair with bicuspidization in the paediatric population

Shunsuke Matsushima ^a, Alexander Heß^a, Julia Renata Lämmerzahl^a, Irem Karliova ^a,
Hashim Abdul-Khaliq^b and Hans-Joachim Schäfers^{a,*}

European Journal of Cardio-Thoracic Surgery 59 (2021) 253–261



Conclusion

- In judging the results of patch repair in AV repair we must consider:
- Material
 - Autologous pericardium
 - Heterologous pericardium
 - ~~Synthetic~~
- Valve morphology (TAV vs others)
- Underlying pathology
- Repair design
 - Eg. geometric assessment (eH, gH)?
- Use of pericardial patches reasonable in TAV repair (e.g. fenestrations, defects)
- Increased failure rate in BAV and UAV repair (individualized decision)

➔ **Need for new material with better durability (Autotissue?)**

THANK YOU



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