Re-implantation Should be the Standard Technique

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Medical Center at Ter

Chaim Sheb



The Leviev Heart Center













0.00001%

"When you start supporting a football club, you don't support it because of the trophies, or a player, or history, you support it because you found yourself somewhere there; found a place where you belong"

BERGKAMP

KANONERZY



AP



YOU CAN CHANGE YOUR WIFE, YOUR POLITICS, YOUR RELIGION, BUT NEVER, NEVER CAN YOU CHANGE YOUR FAVOURITE FOOTBALL TEAM. - ERIC CANTONA





Important Factors to Compare

- Different phenotypes
- Surgical complexity
- Operative times (CPB, Cross-clamp)
- Early outcomes: morbidity & mortality
- Long term outcomes: freedom from re-op, freedom from recurrent AI
- Sub-populations: connective tissue (Marfan etc)

"Type 1" Root, Younger (10-40y), Hereditary connective synd. (Marfan, Loyes-Dietz, BAV with "root phenotype")







Root Remodeling (M. Yacoub)



Type 1-Root Phenotype





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Root Remodeling

Preoperative aortic root geometry and postoperative cusp configuration primarily determine long-term outcome after valve-preserving aortic root repair

Takashi Kunihara, MD, PhD,^a Diana Aicher, MD,^a Svetlana Rodionycheva, MD,^a Heinrich-Volker Groesdonk, MD,^a Frank Langer, MD,^a Fumihiro Sata, MD, PhD,^b and Hans-Joachim Schäfers, MD, PhD^a

1995-2009, 401 remodeling, 29 re-implantation (24 marfan pts)

Stratified by AVJD

Restore Normal Root Geometry

Kunzelman K, 1994

Remodeling +annuloplasty (D3, Lansac)

Compare

Courtesy E Lansac

Expansible Band

PTFE annuloplasty

Lansac 2006

Kazui, Svensson, Schäfers 2007

LVOT and Aortic Root Complex

Surgical Anatomy of the Aortic Annulus: Landmarks for External Annuloplasty in Aortic Valve Repair

Nizar Khelil, MD, Ghassan Sleilaty, MD, Michele Palladino, MD, Mahmoud Fouda, MD, Remi Escande, MD, Mathieu Debauchez, MD, Isabelle Di Centa, MD, and

(Ann Thorac Surg 2015;99:1220–7)

RE-Implantation (David)

Re-implantation BAV

Standardized approach to valve repair using an expansible aortic ring versus mechanical Bentall: Early outcomes of the CAVIAAR multicentric prospective cohort study

Emmanuel Lansac, MD, PhD,^a Olivier Bouchot, MD, PhD,^b Eric Arnaud Crozat, MD,^c Rachid Hacini, MD,^c Fabien Doguet, MD, PhD,^d Roland Demaria, MD, PhD,^e Alain Leguerrier, MD,^f

ECC time (min) mean \pm SD (range)	156.1 ± 49.2 (65-315)	183.1 ± 38.7 (114-315)	129.1 ± 43.5 (65-314)	<.0001†
AC time (min) mean \pm SD (range)	123.8 ± 38.1 (50-137)	$147.7 \pm 30.1 \ (103-237)$	99.8 ± 29.2 (50-180)	<.0001†
Second CPB run	12 (4.6%)	11 (8.5%)	1 (0.8%)	.003*
Second CPB AC time (min)	$32.0 \pm 14.2 \ (20-65)$	28.3 ± 8.7 (20-45)	65.0 (.)	.004†

Lansac E, JTCVS 2015

Function of Aortic Sinuses

The effect of the sinuses of valsalva on cusp closure

With Sinuses

No Sinuses

Courtesy Schafers H

Neo-Aortic Sinuses

Valsalva grafts

A quarter of a century of experience with aortic valve-sparing operations

The Journal of Thoracic and Cardiovascular Surgery • September 2014

Marfan compared to non- Marfan Patients Late Echo

Preoperative aortic root geometry and postoperative cusp configuration primarily determine long-term outcome after valve-preserving aortic root repair

Takashi Kunihara, MD, PhD,^a Diana Aicher, MD,^a Svetlana Rodionycheva, MD,^a Heinrich-Volker Groesdonk, MD,^a Frank Langer, MD,^a Fumihiro Sata, MD, PhD,^b and Hans-Joachim Schäfers, MD, PhD^a

Age (years)	MFS	Year opei	of ration	Cause of operation	Technique of operation	Graft (mm)	AVJ (mm)	Cause of reoperation	Interval (months)
3	Yes	1999)	Root dilatation	Remodeling	18	18	Cusp prolapse	65
48	Yes	1998	3	Root dilatation	Reimplantation	26 + 20	27	Cusp retraction	111
30	Yes	1998	3	Acute dissection	Reimplantation	28 + 24	33	Commissural detachment	25
50	No	1999)	Root dilatation	Reimplantation	26	30	Infective endocarditis	120
37	No	1997	7	Acute dissection	Reimplantation	26 + 20	23	Commissural detachment	161
		40 -	Dette	uto ot viole					
	20 - Patients at risk		nts at risk	61	Remodeling Reimplantation				
		$0 - \frac{407}{29} - \frac{203}{24} - \frac{67}{13}$		<u>13</u>					
			0	5	10			nique of root repair but	by the preope

Table IV: Details of patients who required reoperation on the agric value

Figure 5. Late deaths for reimplantation versus remodeling.

and

Total events

Heterogeneity: Chi² = 0.10, df = 1 (P = 0.75); I² = 0%

	Reimplantation		Remodeling			Risk Ratio	Risk Ratio			
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% C	4	M-H, Fixe	ed, 95% Cl	
Burkhart et al. (2003)	11	52	1	14	6.5%	2.96 [0.42, 21.03]				
David et al. (2006)	3	167	3	53	18.8%	0.32 [0.07, 1.53]			+	
Eichinger et al. (2008)	0	28	5	28	22.7%	0.09 [0.01, 1.57]		-	+	
Erasmi et al. (2007)	1	68	7	96	23.9%	0.20 [0.03, 1.60]			+	
Graeter et al. (2002)	0	21	3	98	5.2%	0.64 [0.03, 12.00]				
Leyh et al. (2002)	0	22	3	8	20.7%	0.06 [0.00, 0.98]		-	1	
Wang et al. (2010)	2	9	0	8	2.2%	4.50 [0.25, 81.76]			-	-
Total (95% CI)		367		305	100.0%	0.46 [0.23, 0.92]		•		
Total events	17		22							
Heterogeneity: Chi ² = 1	0.05, df = 6	(P = 0.12	2); l² = 40%	6			0.001	0.1	1 10	1000
Test for overall effect: Z	: = 2.21 (P =	0.03)					Favors rein	nplantation	Favors remo	deling

Meng, M.D.,

Figure 6. Reoperation related to moderate or severe AI for reimplantation versus remodeling.

related to moderate or severe AI during follow-up (pooled RR 0.46; 95% CI 0.23 to 0.92; p = 0.03). Conclusion: Comparing with remodeling, reimplantation technique has less chance for reoperation related to moderate or severe AI during long-term follow-up. doi: 10.1111/j.1540-8191.2010.01171.x (J Card Surg 2011;26:82-87)

Liu Lei. J Card Surg 2011

Figure 6. Reoperation related to moderate or severe AI for reimplantation versus remodeling.

Factors associated with the development of aortic valve regurgitation over time after two different techniques of valve-sparing aortic root surgery

Thorsten Hanke, MD,^{a,*} Efstratios I. Charitos, MD,^{a,*} Ulrich Stierle, MD,^{a,*} Derek Robinson, MA, MSc, DPhil, CStat,^b Armin Gorski, MD,^c Hans-H. Sievers, MD,^a and Martin Misfeld, MD, PhD^a

FIGURE 4. Multilevel modeling of the association of preoperative aortic annulus diameter and AR grade with time in patients treated with the reimplantation (A) and remodeling (B) techniques. With increasing diameters of the aortic annulus, aortic valve incompetence is pronounced in patients treated with the

Hanke T JTCVS 2009

VALVE-PRESERVING REPLACEMENT OF THE ASCENDING AORTA: REMODELING VERSUS REIMPLANTATION

H.-J. Schäfers, MD, PhD^a R. Fries, MD^b F. Longer, MD^a *Objective:* Aortic valve regurgitation in combination with dilatation of the ascending aorta and root requires a combined procedure to restore

Schafers HJ, JTCVS 1998

Conclusions: Depending on individual root pathologic condition, both the remodeling and the reimplantation techniques appeared to have their individual merits. Both result in adequate restoration of aortic valve function and elimination of pathologic aortic dilatation. (J Thorac Cardiovasc Surg 1998;116:990-6)

Summary I

- Re-implantation is slightly more complex procedure with longer operative times
- This has not seemed to affect early M&M
- Long-term outcomes are comparable mainly due to stratification of type I root to the re-implantation

Summary II

- Procedures are not competitive to each other:
 - For type 2 root aneurysm, the remodeling chould be the preferred approach
 - For younger pts with type 1 root aneurysm and genetic syndromes, re-implantation has proven to be effective with excellent long term outcomes.
- D3 or the remodeling + annuloplasty (Lansac/Schafers), may also provide acceptable outcomes, long-term FU is needed

The wolf also shall dwell with the lamb, and Tiger with the kid

Thank you

The Leviev Heart Center