

10 Years of PMEGs For Complex AAAs

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Disclosures

- None

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Background

Long-Term Outcomes of Abdominal Aortic Aneurysm in the Medicare Population

EVAR offers a perioperative mortality advantage over open repair. Its popularity increased rapidly following its introduction

FDA approval of fenestrated devices expanded the scope of endovascular aortic surgery and enabled treatment of more complex aortic disease involving the visceral segment

Physician modification of endovascular devices has allowed individualized treatment tailored to a patient's anatomical needs without the need to wait for graft manufacturing

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Institutional Experience

JVS Journal of Vascular Surgery | SVS Society for Vascular Surgery

FULL LENGTH ARTICLE - Articles in Press, August 22, 2024

Ten years of physician-modified endografts

Andrew P. Sanders, MD^a · Jorge Gomez-Mayorga, MD^a · Mohit K. Manchella, BS^a · Nicholas J. Swerdlow, MD^b · Marc L. Schermerhorn, MD, FA^a EB

- Describe how PMEG outcomes have changed throughout our experience
- Compare PMEG outcomes to a similar method of complex endovascular aortic repair

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Institutional Experience

- Data from 2012 – 2023, stratified into four time periods (less cases in the first years):
 - 2012-2017
 - 2018-2019
 - 2020-2021
 - 2022-2023
- Includes data from:
 - Ongoing PMEG IDE trial (NCT #04746677)
 - Cases performed urgently/emergently, and patients with prior aortic surgery
 - ZFEN cases for comparison
- Trend tests to assess changes in operative characteristics of PMEGs over time and Kaplan-Meier methods to compare survival and reintervention in PMEG vs ZFEN in a 5-year period.

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Institutional Experience: Temporal Trends PMEG Outcomes

Factor	Level	2012-2017	2018-2019	2020-2021	2022-2023	p-value
N		28	59	54	45	
	Urgency	Elective 26 100%	57 97%	47 87%	35 78%	<0.001
	Urgent	0 0%	2 3%	6 11%	10 22%	
Target Vessels	Emergent	0 0%	0 0%	1 2%	0 0%	
	1	3 12%	1 2%	1 2%	1 2%	0.002
	2	1 4%	1 2%	0 0%	0 0%	
	3	7 27%	14 24%	6 11%	4 9%	
	4	15 58%	39 66%	44 81%	39 87%	
	5	0 0%	4 7%	3 6%	1 2%	
Contrast (mL)		107 (45, 188)	69 (25, 196)	140.5 (102, 200)	136.5 (107, 169)	0.074
Fluoroscopy Time (min)		73.8 (57.5, 104.7)	71 (52.7, 96.3)	59 (49.0, 85.6)	45 (32.6, 67.0)	0.004
Procedure Time (min)		189 (152, 318)	167 (135, 223)	188.5 (151, 277)	170 (144, 196)	0.068
EBL (mL)		250 (100, 500)	100 (50, 200)	100 (50, 200)	100 (50, 200)	0.010
Completion Type I	Endoleak	3 12%	10 17%	0 0%	1 2%	0.006
	Completion Type III	11 42%	15 25%	13 24%	5 11%	0.005
Endoleak						

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How do results vary with vs. without an IDE?

- Trend toward decreased fluoroscopy time and decreased rate of completion type I and type III endoleaks (all $p < .05$).
- Stable perioperative outcomes and perioperative mortality of 4.9% (includes urgent/emergent cases).
- Learning curve, increase in patient experience.
- Increased complexity of cases.
- All TAAA/CAAA PMEG patients go into IDE. FDA Mandate. Need Emergency approval from FDA and IRB for any implant outside of Inclusion/Exclusion

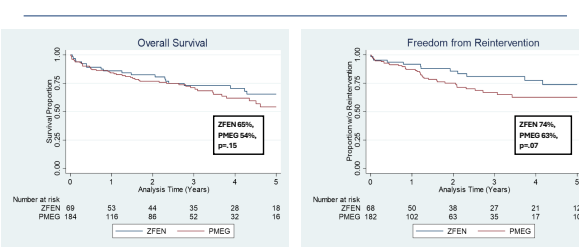
Institutional Experience: ZFEN vs. PMEG

Factor	Level	ZFEN	PMEG	p-value
N		69	184	
Prior Aortic Surgery		7 (10.1%)	46 (25.0%)	<0.001
Prior Aortic Surgery Type				0.21
	Open	1 (20%)	13 (15%)	
	EVAR	2 (40%)	57 (67%)	
	TEVAR	1 (20%)	12 (14%)	
	Combination	1 (20%)	4 (5%)	
Pre Aortic Diameter, median (IQR)		36.5 (34.0-41.0)	35.0 (34.0-40.0)	0.003
Aneurysm Extent				<0.001
	Type I TAAA	0 (0.0%)	4 (2.2%)	
	Type II TAAA	0 (0.0%)	18 (9.8%)	
	Type III TAAA	0 (0.0%)	3 (1.6%)	
	Type IV TAAA	0 (0.0%)	17 (9.2%)	
	Supraaortic	0 (0.0%)	0 (0.0%)	
	Juxtarenal	62 (91.2%)	122 (66.3%)	
Urgency				0.02
	Infrarenal	6 (9.0%)	22 (12.0%)	
	Urgent	0 (0.0%)	18 (9.8%)	
	Emergent	0 (0.0%)	1 (0.5%)	
Target Vessels				<0.001
	2	2 (2.9%)	5 (2.7%)	
	3	6 (8.7%)	2 (1.1%)	
	4	0 (0.0%)	1 (0.5%)	
	5	0 (0.0%)	137 (74.3%)	

Institutional Experience: ZFEN vs. PMEG

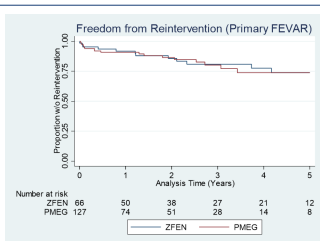
Factor	ZFEN	PMEG	p-value
N	69	184	
Perioperative Mortality	3 (4.3%)	9 (4.9%)	0.86
Any Complication	12 (17.4%)	39 (21.2%)	0.50
Any Groin Complication	6 (8.7%)	4 (2.2%)	0.02
SCI	0 (0.0%)	16 (8.7%)	0.01
Permanent SCI	0 (0.0%)	2 (1.1%)	0.38
Postop MI	2 (2.9%)	8 (4.3%)	0.60
Postop Respiratory Failure	3 (4.3%)	13 (7.1%)	0.43
Postop CVA	0 (0.0%)	6 (3.3%)	0.13
Bowel Ischemia	2 (2.9%)	2 (1.1%)	0.3
New HD	3 (4.3%)	4 (2.2%)	0.35
LOS, median (IQR)	2 (1, 5)	4 (3, 8)	<0.001

PMEG and ZFEN Five-Year Outcomes



How do results vary with previous aortic surgery?

- PMEG cohort was significantly more likely to have had prior aortic surgery.
- When looking only at primary FEVARs the groups behaved similarly.



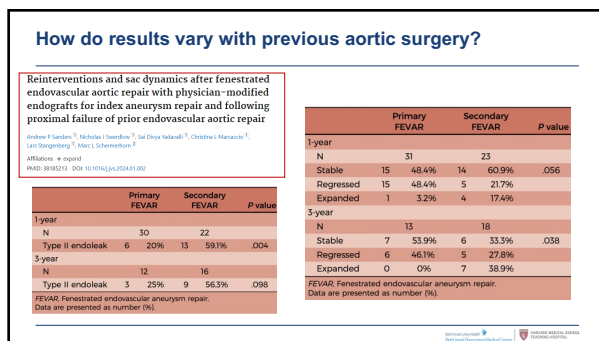
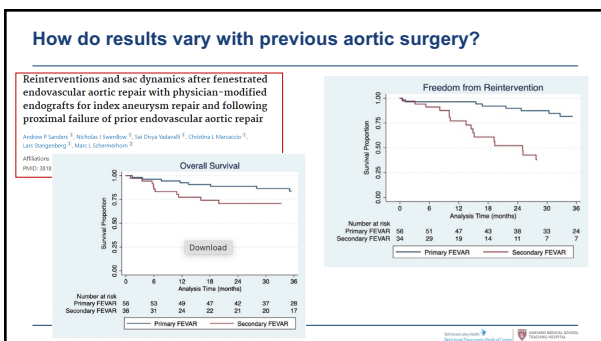
How do results vary with previous aortic surgery?

Reinterventions and sac dynamics after fenestrated endovascular aortic repair with physician-modified endografts for index aneurysm repair and following proximal failure of prior endovascular aortic repair
 Andrea P. Sardenia¹, Nicholas J. Goodrow², Sai Datta Yadav³, Christine L. Marzocco⁴, Lars Stangenberg⁵, Marc L. Schermerhorn⁶
 ARRS¹ + expand
 PMID: 39382629 DOI: 10.1093/ctj/cz324/511002

Outcomes of fenestrated-branched endovascular aortic repair in patients with or without prior history of abdominal endovascular or open surgical repair
 Andrea Veldora¹, Jiahua Wang², Arden Bagheri-Oskoui³, Emanuel R. Sorocoll⁴, Ying Huang⁵, Albert Sliwa⁶, Ahmed Saqqa⁷, Taha Suber⁸, Thomas Mena⁹, Samir C. Wender¹⁰, Gustavo S. Oliveira¹¹
 ARRS¹ + expand
 PMID: 37580442 DOI: 10.1093/ctj/cz202/504301

Midterm Outcomes and Aneurysm Sac Dynamics Following Fenestrated Endovascular Aneurysm Repair after Previous Endovascular Aneurysm Repair
 Tracy L. Squires¹, Craig D. Bann², Shyam Kishor³, Ger Lee Bann⁴, Thomas Haines⁵, Brian Hoar⁶, Mark Jovanovic⁷, Hani L. Schermerhorn⁸, Gustavo S. Oliveira⁹, James W. Thompson¹⁰
 ARRS¹ + expand
 PMID: 36281071 DOI: 10.1093/ctj/cz240/510710

Comparison of Early and Mid-Term Outcomes After Fenestrated-Branched Endovascular Aortic Repair in Patients With or Without Prior Infrarenal Repair
 Marco Di Cola¹, Jacob Butler-Lilly², David Lindstrom³, Steven Lundberg⁴, Magnus Jonsson⁵, Anders Westhagen⁶, Kristian Nygård⁷, Jan Hultcrantz⁸
 ARRS¹ + expand
 PMID: 34781751 DOI: 10.1077/1526220821105886



Key Points

- Throughout our PMEG experience, operative outcomes have improved over time
- Similar outcomes to ZFENs for primary PMEGs
- PMEGs often treating more extensive aneurysms and in more urgent cases, but with similar outcomes compared to ZFENs
- Increased physician experience and comfort, in addition to technological advances
- PMEG is a reasonable treatment, and we need to share best practices, and monitor outcomes nationally

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Thank You

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