Quality of Life in Diabetics with Multi-Vessel Coronary Artery Disease: Real-World Experience Comparing PCI and CABG

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BACKGROUND – CAD & REVASC

- Despite advances in care, coronary artery disease (CAD) remains a leading cause of death, second to only cancer in Canada (Stats Can Data).
- Over the last 20 years, PCI has become the revascularization modality of choice in most patients with CAD (Figure 1).

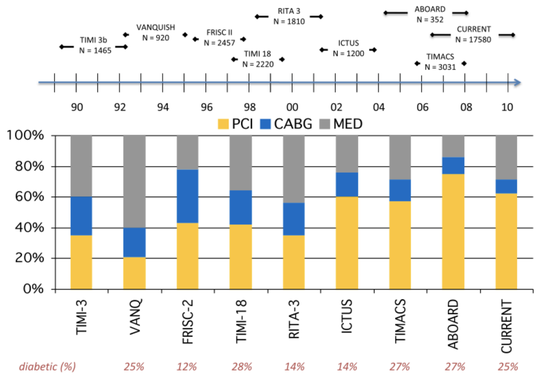

FIGURE 1: Changing pattern of revascularization from 1990-2008, compiled from published data from various trials (From Teo et al. 2014).

REVASCULARIZATION & QOL

- The higher peri-operative mortality and stroke combined with longer recovery times have lead some to question the effects of CABG on patient QOL.
- Recent data from the FREEDOM trial suggest that CABG is statistically superior to PCI in terms of health status and quality of life out to 2 years of follow-up (Figure 5).
- However, this was a study population and it is unclear if these differences would reflect real-world experiences.

STUDY AIM

- To compare the effects of CABG and PCI on QOL in Diabetics with multi-vessel CAD.

METHOD

- The Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease (APPROACH) is an outcomes initiative for patients undergoing cardiac revascularization.
- Like in FREEDOM, health status is measured using the well-validated Seattle Angina Questionnaire (SAQ):
  - ✓ SAQ is a 19-item self-admin disease-specific questionnaire measuring five domains of health status on a Likert scale: Anginal Stability, Anginal Frequency, Exertional Capacity, Treatment Satisfaction and Quality of Life.
- We identified 1319 diabetic patients (599 CABG and 720 PCI) with mvCAD requiring revascularization from Jan 2009 to Dec 2012 who reported health status outcomes using SAQ at baseline, 1, 3 and 5 years.
- Adjusted analysis was performed using a propensity score-matching technique with a resultant 732 patients matched.

BACKGROUND – CABG vs PCI in MULTI-VESSEL CAD

- That said, early studies demonstrated benefit in terms of major adverse cardiovascular and cerebrovascular events (MACCE), MI, repeat revascularization and overall mortality supporting CABG over PCI in diabetics with mvCAD (CARDia, FREEDOM).
- In spite of advances in medical therapy, CABG has maintained its superiority when compared to both bare metal (ARTS, MASS II, SoS) and drug-eluting (SYNTAX, CARDia, FREEDOM) stents in mvCAD.
- Moreover, a recent meta-analysis suggests the benefits of CABG extend out over the long-term in both diabetic and non-diabetic patients with mvCAD (Figures 2 & 3).

Source	Statistics for Each Study: RR (95% CI)	*Z* Value	*P* Value	MACCE/Total: CABG	PCI
ARTS[10,11]	0.53 (0.45-0.64)	-6.95	<.001	132/584	250/590
CARDia[7]	0.59 (0.38-0.90)	-2.44	.01	28/242	49/248
SYNTAX multivessel[9,12]	0.65 (0.53-0.81)	-3.83	<.001	103/547	158/548
FREEDOM[16]	0.71 (0.57-0.89)	-2.95	<.001	112/947	158/953
Meta-analysis	**0.61 (0.54-0.68)**	-8.55	<.001	375/2320	615/2339

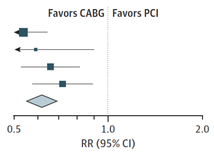

FIGURE 2: MACCE According to Treatment Arm (N=5067) (From Sipahi et al. 2014).

Source	Statistics for Each Study: RR (95% CI)	*Z* Value	*P* Value	Death/Total: CABG	PCI
ARTS[10,11]	0.97 (0.66-1.43)	-0.16	.87	46/584	48/590
MASS II[6]	0.67 (0.37-1.23)	-1.29	.20	16/203	24/205
SoS[2,15]	0.63 (0.41-0.95)	-2.23	.03	34/500	53/488
CARDia[7]	1.02 (0.39-2.69)	0.05	.96	8/242	8/248
SYNTAX multivessel[9,12]	0.60 (0.39-0.92)	-2.36	.02	31/547	52/548
FREEDOM[16]	0.73 (0.56-0.95)	-2.31	.02	86/947	118/953
Meta-analysis	**0.73 (0.62-0.86)**	-3.69	<.001	221/3023	303/3032

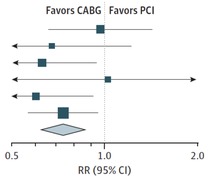

FIGURE 3: Mortality According to Treatment Arm (N=6055) (From Sipahi et al. 2014).

- Although CABG is superior in terms of all-cause mortality it is associated with longer recovery times and higher rates of stroke (Figure 4).

Source	Statistics for Each Study: RR (95% CI)	*Z* Value	*P* Value	Stroke/Total: CABG	PCI
ARTS[10,11]	0.92 (0.52-1.65)	-0.27	0.79	21/584	23/590
MASS II[6]	1.73 (0.70-4.31)	1.18	0.24	12/203	7/205
CARDia[7]	7.17 (0.89-57.87)	1.85	0.06	7/242	1/248
SYNTAX multivessel[9,12]	1.14 (0.56-2.32)	0.38	0.71	16/547	14/548
FREEDOM[16]	1.69 (1.01-2.85)	1.98	0.05	37/947	22/953
Meta-analysis	**1.36 (0.99-1.86)**	**1.91**	**0.06**	93/2523	67/2544

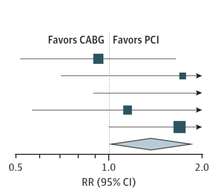

FIGURE 4: Strokes According to Treatment Arm (N=5067) (From Sipahi et al. 2014).

- In FREEDOM QOL was better with PCI at baseline, with CABG patients trending higher thereafter (Figure 5).

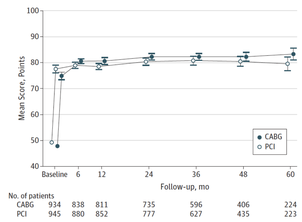

FIGURE 5: SAQ – Quality of Life (From Abdallah et al. 2013).

RESULTS

- Baseline characteristics were similar between groups following propensity matching (Table 1).
- At baseline, CABG patients reported significantly lower scores in terms of exertional capacity, angina stability, angina frequency, treatment satisfaction and quality of life (Figures 6-10).
- At 1 year, CABG patients reported significantly higher scores in terms of angina stability, treatment satisfaction and quality of life compared to PCI.
- By 5 years, CABG and PCI patients were similar across the five SAQ domains.

TABLE 1: Baseline Patient Characteristics.

	CABG (N=366)	PCI (N=366)	p-Value
Age (years)	65.2	65.2	0.992
Women (%)	19.4	18.0	0.636
Mean BMI	29.7	29.9	0.630
HTN (%)	19.9	22.1	0.468
Dialysis (%)	1.1	0.5	0.412
Dyslipidemia (%)	79.0	80.9	0.518
Smoker (%)	18.3	17.8	0.848
X-Smoker (%)	48.4	48.1	0.941
Previous MI (%)	31.4	32.2	0.812
CHF (%)	13.4	12.3	0.659
Prior CABG (%)	4.6	5.5	0.613
Prior PCI (%)	8.5	9.0	0.794
Creatinine > 200 (%)	4.1	3.3	0.556
COPD (%)	11.5	10.1	0.551
PVD (%)	8.7	9.3	0.796
Stroke (%)	5.2	4.9	0.866
Age ≥ 75 years (%)	11.2	16.4	0.042
Multi-Vessel CAD (%)			
2 vessel disease	0.8	2.5	0.055
2 vessel > 75%	5.0	5.6	
2 vessel with 95% LAD	5.8	6.4	
2 vessel with 95% pLAD	9.4	7.8	
3 vessel disease	0	0.3	
3 vessel with 1 vessel 95%	37.8	42.9	
3 vessel with pLAD	11.3	10.9	
3 vessel with 95% pLAD	16.3	17.3	
Left Main	9.7	3.6	
Severe Left Main	3.9	2.8	

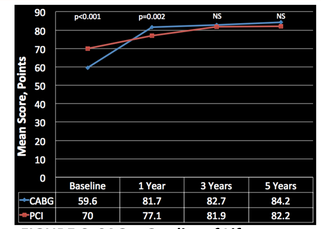

FIGURE 6: SAQ – Quality of Life

FIGURE 7: SAQ – Angina Frequency

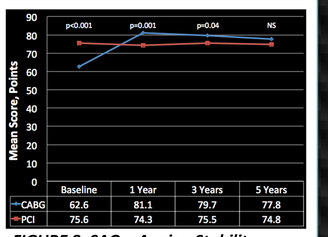

FIGURE 8: SAQ – Angina Stability

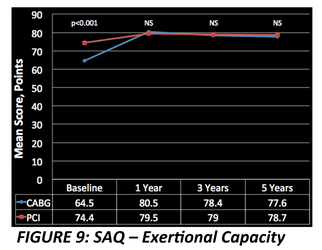

FIGURE 9: SAQ – Exertional Capacity

FIGURE 10: SAQ – Treatment Satisfaction

CONCLUSIONS

- In spite of a worse baseline status, diabetics with multi-vessel CAD reported greater improvement in Health Status and Quality of Life at 1 year following CABG when compared to PCI-treated patients.
- By 5 years, the two groups were similar in all SAQ domains.
- These results confirm those of the FREEDOM trial in a real-world patient population and should be considered when deciding upon revascularization in diabetic patients with multi-vessel CAD.

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