

Semaglutide Use is Associated with Higher Rates of Pseudoarthrosis and Dysphagia in Patients Undergoing Posterior Cervical Fusion

Mitchell K Ng, Paul G. Mastrokostas, Leonidas Mastrokostas, Ameer Tabbaa, Matthew Charles Johnson, Jad Bou Monsef, Afshin Razi

INTRODUCTION:

Semaglutide, a glucagon-like peptide-1 (GLP-1) receptor agonist, has shown efficacy in managing glycemic control and obesity but its effects on surgical outcomes, particularly in posterior cervical fusion (PCF), are underexplored. The purpose of this study was to evaluate the association between semaglutide use and postoperative complications, costs, and readmissions in patients undergoing PCF.

METHODS:

Patients undergoing PCF were queried from the PearlDiver Mariner database between 2010 and 2022. Patients with an active semaglutide prescription were propensity score-matched in a 1:5 ratio to controls based on age, sex, Elixhauser Comorbidity Index, and other clinical variables. Outcomes included medical and surgical complications, readmissions, emergency department visits, and associated costs within 90 days and two years postoperatively. Statistical analyses included chi-square tests and logistic regression, with significance set at $P < 0.003$ after Bonferroni correction.

RESULTS:

A total of 340 semaglutide users and 1,540 matched controls were included. Semaglutide use was associated with significantly higher odds of pseudoarthrosis at two years (OR 4.79, 95% CI 3.11–7.37; $P < 0.001$) and dysphagia (OR 2.12, 95% CI 1.46–3.03; $P < 0.001$). Hospital cost analyses revealed significant differences between groups. Same-day (\$5,000 vs. \$11,700; $P < 0.001$) and mean 90-day costs were significantly lower (\$12,200 vs. \$18,800; $P < 0.001$) in the semaglutide group. No differences were observed in emergency department visits or readmissions ($P > 0.003$ for all).

DISCUSSION AND CONCLUSION:

Semaglutide use is associated with an increased risk of long-term complications, including pseudoarthrosis and dysphagia, as well as lower same-day and 90-day costs in patients undergoing PCF. These findings highlight the importance of careful perioperative management of semaglutide users to optimize outcomes while leveraging its purported

benefits.

Demographic Variable	Semaglutide (N=340)	Control (N=1540)	P-value
Age			0.99
18-29	N/A	N/A	
30-39	4.2%	5.9%	
40-49	7.0%	5.7%	
50-59	12.0%	10.9%	
60-69	19.7%	18.2%	
70-79	28.2%	25.9%	
80-89	22.8%	17.0%	
90-99	17.0%	12.3%	
>75	8.0%	5.6%	
Sex			0.99
Female	47.3%	47.2%	
Male	52.6%	52.7%	
ECI			0.92
1	N/A	N/A	
2	11.0%	9.1%	
3	13.0%	10.7%	
4	2.0%	1.9%	
5	10.2%	10.9%	
6	11.4%	11.8%	
7	9.7%	9.8%	
8	11.7%	11.8%	
9	10.2%	10.1%	
10	4.7%	4.9%	
11	8.5%	8.9%	
Medical Comorbidity			0.62
Obesity	80.3%	80.8%	
Insulin use	6.0%	6.0%	
Hypertension	51.1%	51.4%	
Diabetes use	12.0%	12.0%	
Coronary artery disease	34.7%	33.1%	
Chronic kidney disease stage 1-3	0.0%	0.0%	

Outcome	Semaglutide (N=340)	Control (N=1540)	P-value
Medical Complications (90-day)			
Cardiomyopathy/infarction	3	21	0.43
Deep vein thrombosis	3	13	0.84
Pulmonary embolism	N/A	N/A	N/A
Vascular thromboembolism	3	13	0.84
Myocardial infarction	N/A	N/A	N/A
Pneumonia	4	47	0.04
Acute kidney injury	4	23	0.40
Hypotension	N/A	N/A	N/A
Sepsis	6	0	N/A
Surgical Complications (90-day)			
Adjuster segment disease	7	42	0.001
Deep infection	2	2	0.95
Pseudoarthrosis	20	18	0.80
Dysphagia	23	18	0.80
Dysphagia	N/A	N/A	N/A
Cervical spinal cord injury	4	28	0.13
Device failure	5	15	0.20
Hemorrhage/hematoma	6	13	0.44
Contrast media leak	N/A	N/A	N/A
Large vascular injury	N/A	N/A	N/A
Surgical site infection	11	59	0.001
Adjuster segment disease	N/A	N/A	N/A
Deep infection	11	42	0.001
Pseudoarthrosis	46	21	0.001
Dysphagia	49	114	0.001
Dysphagia	7	21	0.20
Cervical spinal cord injury	15	34	0.02
Device failure	18	24	0.001
Hemorrhage/hematoma	9	15	0.03
Contrast media leak	N/A	N/A	N/A
Large vascular injury	10	0	0.001
Wound dehiscence	10	23	0.001
90-day ED visits	16	31	0.001

Outcome	OR	95% CI	P-value
Medical Complications (90-day)			
Cardiomyopathy/infarction	0.65	0.15	0.48
Deep vein thrombosis	1.03	0.23	0.94
Pulmonary embolism	1.28	0.08	0.05
Vascular thromboembolism	1.04	0.24	0.93
Myocardial infarction	1.27	0.20	0.05
Pneumonia	0.38	0.11	0.003
Acute kidney injury	1.07	0.46	0.81
Hypotension	0.93	0.14	0.90
Sepsis	3.64	0.01	0.001
Surgical Complications (90-day)			
Adjuster segment disease	0.73	0.29	0.41
Deep infection	2.50	0.12	0.001
Pseudoarthrosis	0.94	0.37	0.90
Dysphagia	6.29	3.18	0.001
Dysphagia	1.83	1.00	0.01
Cervical spinal cord injury	0.69	0.04	0.13
Device failure	1.30	0.59	0.20
Hemorrhage/hematoma	1.77	0.56	0.28
Contrast media leak	2.06	0.71	0.11
Large vascular injury	1.43	0.23	0.001
Wound dehiscence	0.90	0.65	0.94
Surgical Complications (2-year)			
Adjuster segment disease	0.82	0.40	0.52
Deep infection	2.80	0.94	0.001
Pseudoarthrosis	1.14	0.55	0.11
Dysphagia	4.79	3.11	0.001
Dysphagia	2.12	1.46	0.001
Cervical spinal cord injury	1.47	0.57	0.30
Device failure	2.06	1.08	0.03
Hemorrhage/hematoma	2.22	1.22	0.001
Contrast media leak	1.47	0.32	0.001
Large vascular injury	0.90	0.68	0.001
Wound dehiscence	0.97	0.70	0.001
90-day ED visits	2.12	1.67	0.001

Postoperative Variable	Semaglutide Mean (\$)	Control Mean (\$)	P-value
Same-day	5,000	11,700	<0.001
90-day	12,200	18,800	<0.001

N = Number, % = Percentage, CI = Confidence Interval, ED = Emergency Department, Bolded P-values are significant.

OR = Odds Ratio, CI = Confidence Interval, ED = Emergency Department, Bolded P-values are significant.