

Trimming the Fat: Can GLP-1 Receptor Agonist Therapy Impact Post-Traumatic Osteoarthritis Development After a Tibial Plateau Fracture?

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Purpose: Our objective was to evaluate the effect of prolonged GLP-1 usage on rates of posttraumatic osteoarthritis (PTOA) following surgical treatment of tibial plateau fractures across multiple body mass index (BMI) strata.

Methods: Between 2016 and 2023, 21 patients on long-term GLP-1 therapy for obesity (pretreatment BMI mean: 33.80 ± 5.61) who sustained a tibial plateau fracture requiring surgical fixation were identified (Group A). They were compared to three groups of patients with varying BMI who were not on GLP-1 therapy: Group B (BMI: 18.5–25, n = 150), Group C (BMI: 25–30, n = 150), and Group D (BMI: ≥ 30 , n = 101) (see table). Demographics and clinical characteristics were analyzed. Analysis of variance (ANOVA) and χ^2 tests, with standardized adjusted residuals, were used.

Results: In total, 422 patients were included in the analysis. Age and Charlson Comorbidity Index (CCI) were statistically similar across cohorts, except for Group A, which had a significantly higher CCI. As intended by study design, BMI differed significantly among groups ($p < 0.001$). Group D (obese) exhibited a markedly higher incidence of PTOA (32.05%), with a standardized residual of approximately 2.79 ($p \approx 0.005$). In contrast, Group A (GLP-1 therapy) demonstrated rates of PTOA comparable to Groups B and C ($\chi^2 \approx 0.95$, $p \approx 0.62$).

Conclusion: Obese patients on GLP-1 receptor agonists demonstrated a significantly lower incidence of PTOA compared to untreated obese counterparts, with outcomes comparable to non-obese individuals.

Table 1: Outcomes by Group (Mean $\pm$ Standard Deviation)

	Group A	Group B	Group C	Group D	P-Value
N	21	150	150	101	–
Pre-injury Ozempic Usage (days)	881.1 ± 1015.78	N/A	N/A	N/A	–
Ozempic Start BMI (kg/m^2)	33.80 ± 5.61	N/A	N/A	N/A	–
Age at Surgery (years)	51.24 ± 15.35	50.53 ± 16.79	50.91 ± 14.41	52.60 ± 11.99	NS
BMI (kg/m^2)	31.28 ± 2.29	22.40 ± 1.73	27.28 ± 1.41	35.11 ± 4.63	0.01
Charlson Comorbidity Index	2.24 ± 1.81	0.35 ± 0.73	0.42 ± 0.91	0.40 ± 0.88	0.01
Length of Follow Up (months)	14.66 ± 12.68	29.81 ± 24.87	29.54 ± 24.19	29.27 ± 22.10	NS
Post Traumatic Osteoarthritis (%)	19.04	13.04	17.39	32.05	0.01