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Impact of Interventional Pain Procedures on Pain Severity, Pain Interference, and Quality of Life in Dogs with Chronic Pain Refractory to Conservative Therapy: A Retrospective Analysis

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Keywords: Quality of Life, Pain, Dogs, Interventional Pain Treatment.

Introduction: Chronic pain in dogs adversely affects mobility, behavior, and quality of life (Brown et al. 2007), often remaining insufficiently managed despite multimodal conservative approaches (Mathews et al. 2014; Epstein et al. 2015). Interventional pain techniques may provide superior control, but data regarding outcomes and owner satisfaction are limited.

Objective: To assess the effect of interventional pain procedures on pain severity and Quality of Life using the Canine Brief Pain Inventory (CBPI) at 7, 30, and 90 days post-procedure.

Hypotheses:

H1: Interventional treatment significantly reduces CBPI scores over time.

H2: Owner satisfaction and willingness correlate with improved outcomes.

Material and Methods: This retrospective cohort study analyzed 30 dogs with refractory chronic pain treated with interventional techniques (epidural, intra-articular injections, nerve blocks). Inclusion required complete CBPI scores at baseline, 7, 30, and 90 days post-treatment, and final owner feedback at 90 days. Data were extracted from a clinical database ($n = 336$), with case selection based on completeness using Python-based filtering. Statistical analysis included the Shapiro-Wilk test for normality, Friedman test for longitudinal CBPI comparison, and Wilcoxon signed-rank tests for post-hoc pairwise analysis. Significance was set at $p < 0.05$.

Results: All 30 dogs had chronic pain >3 months and underwent at least one interventional pain procedure. CBPI total scores decreased significantly from baseline (mean 78.2 ± 3.6) to Day 7 (mean 43.1 ± 5.3), Day 30 (mean 36.3 ± 6.4), and Day 90 (mean 34.6 ± 6.1) (Fig. 1). All CBPI timepoints were normally distributed ($p > 0.16$). Friedman test: $\chi^2 = 54.74$, $p < 0.00001$. Post-hoc Wilcoxon tests: Pre vs Day 7: $p < 0.000000002$; Day 7 vs Day 30: $p = 0.97$; Day 30 vs Day 90: $p = 0.93$; Pre vs Day 90: $p < 0.000000002$. Owner feedback: 100 % (30/30) of owners were satisfied and would opt to repeat the procedure if pain recurred.

Discussion: Interventional pain procedures led to a rapid and statistically significant reduction in pain severity, with the most pronounced improvement observed within the first 7 days post-treatment. While the greatest changes occurred early, pain relief remained stable through Day 90. The absence of significant changes between 7, 30, and 90 days suggests a plateau effect after initial improvement. Consistently high owner satisfaction supports the clinical utility of these techniques in refractory cases.

Conclusion and Clinical Relevance: This study demonstrates that interventional pain management significantly improves quality of life in dogs with chronic pain unresponsive to conservative therapy. The CBPI proved to be a reliable tool for tracking progress. Interventional techniques should be considered earlier in the treatment plan, especially for patients with poor response to conventional medications. Future prospective studies are warranted.

References

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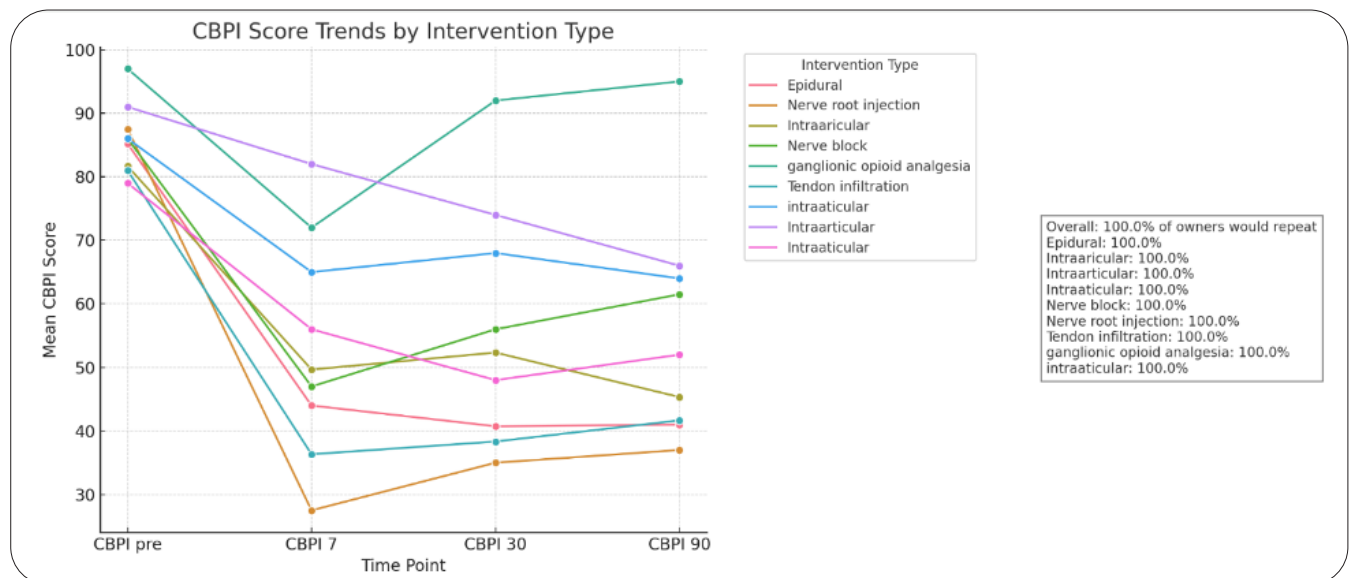


Fig. 1: Graph showing CBPI score improvement over time, grouped by type of interventional procedure. Each line represents the mean CBPI score per treatment group. The Info box shows the overall percentage of owners willing to repeat the procedure.