

# Experimental topical tetracycline-induced neuritis in the rat<sup>\*1</sup>

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## Abstract

**Purpose:** Recent studies have reported that tetracycline may induce chronic inflammatory responses in the adjacent soft tissues. The purpose of the present study was to determine if dry, powdered tetracycline evoked an inflammatory response in nerve tissue.


**Materials and Methods:** Twenty male Sprague-Dawley rats were anesthetized and bilateral mental nerves were exposed. Half of the 40 nerves were intentionally injured by removing the epineurium, and the remaining nerves were uninjured. In a prospective, randomized, double-blind manner, equal volumes of color-matched, precoded tetracycline powder or Gelfoam (Upjohn, Kalamazoo, MI) powder control was placed in intimate contact with the nerves and sealed in polyethylene tubes. Forty-five days later the animals were killed and 5- $\mu$ m sections of the nerves were prepared for histologic examination. The presence of epineurium, fascicular number, and fascicular area were measured. An inflammatory response in nerve tissue and the intrafascicular and epifascicular inflammatory index was measured by counting darkly stained nuclei with a Jandel Video Analysis System (Jandel Scientific, Corte Madera, CA).

**Results:** Experimental injury (ie, epineurectomy) of nerves resulted in a statistically significant increase in fascicular number ( $P = .034$ ), but not in fascicular area. For the intrafascicular inflammatory index, there was a significant main effect for drug ( $P = .002$ ) and injury ( $P = .002$ ). Experimental injury in both Gelfoam control and tetracycline grouped nerves resulted in an increase in intrafascicular inflammation. There was no significant increase in intrafascicular inflammation in either Gelfoam control or tetracycline grouped nerves when the epineurium was intact. The combination of both tetracycline and epineurectomy resulted in the largest increase in intrafascicular inflammation found among the groups studied. For epifascicular inflammatory index, there was a significant main effect for drug ( $P = .003$ ) and injury ( $P = .001$ ) that mirrored the intrafascicular inflammatory pattern.

**Conclusion:** The results of the present study suggest that dry, powdered tetracycline accentuates the inflammatory response in intrafascicular and epifascicular nerve tissue following epineurectomy. The maintenance of epineurium inhibited the inflammatory response in intrafascicular and epifascicular nerve tissues. Gelfoam was an inert material when placed against exposed nerve tissue. These findings suggest that tetracycline should not be placed in extraction sockets when injury of the inferior alveolar and/or lingual nerves are present.

## Article Outline

### [References](#)

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