INTRODUCTION
Establishing the causes of root fracture in endodontically treated teeth is paramount in helping prevent them in the first place. Some theories suggest a change in the mechanical properties of dentin due to the effects of obturation and restorative materials [1]. Calcium hydroxide has many uses including as a liner [2], a pulp-capping agent [3], and an intracanal medicament in endodontic therapy [4]. Its use as an intracanal medicament is twofold: as an antimicrobial agent and in the induction of hard tissue formation as in apexification procedures. During apexification procedures, calcium hydroxide can be left within root canals for up to several years or as long as necessary for apical bridge formation [5]. The effects of calcium hydroxide on the fatigue properties of human root dentin have not been reported. The objective of this study was to determine if exposure to intracanal calcium hydroxide reduces the fatigue strength of human root dentin.

RESULTS
Figure 3 shows that the primary data collected for both the calcium hydroxide and HBSS treated root dentin do not appear consistent. Micrographs of the fracture surfaces were obtained using the SEM and used to study the orientation of the dentin tubules. It was found that the tubule orientation was not constant (Fig 4) and had tubules both parallel and perpendicular to the fracture surface.

DISCUSSION/ FUTURE WORK
Results from the preliminary study show that an evaluation of the mechanical behavior of root dentin in flexure, and an examination of the potential influence of clinical treatments, is complicated by the effects of tubule orientation. The tubule orientation plays a significant role on the fatigue life of dentin [6] and appeared to contribute to the experimental results. Consequently, it was not possible to identify if calcium hydroxide treatments contribute to the fatigue strength of dentin. To isolate the affect of calcium hydroxide on the fatigue properties of dentin it is necessary to use dentin specimens with constant tubule orientation, despite the diversion from clinical protocol. Therefore, an additional study is presently underway using the coronal dentin of unrestored third molars that has been treated with calcium hydroxide.

REFERENCES

ACKNOWLEDGEMENTS
Funding for this investigation was provided in part by the National Institute for Dental and Craniofacial Research (1R01DE014640-01).