Radiation is typically used in the treatment of patients with head and neck cancers. When dental implants reside in the volume being irradiated, the integrity of the implant is often compromised as a result of the treatment. \(^1\) As part of an investigation to determine the cause of such failures, the distribution of radiation dose proximal to the dental implant is being investigated. Dosimetric measurements have been performed using phantoms designed to approximate the geometry of dental implants in bone. The phantoms are mostly comprised of various configurations of steel rods mounted in low-density polyethylene sheets. Thermoluminescence measurements were performed using thin 3.2x3.2x0.15mm chips of lithium fluoride. Typical of the beam energies used in head and neck treatments, the phantoms were exposed to 6MV x-ray and \(^{60}\)Co gamma rays. In agreement with recently published data, results indicate that there is a 5-10% dose enhancement proximal to the surface of the implant upon which the radiation beam impinges. \(^2,3\) A rudimentary model is being developed to assist in evaluation of the dosimetric impact of different implant geometries and configurations.

\(^1\) Gullane,P.J. "Primary mandiular reconstruction: Analysis of 64 cases and evaluation of interface radiation dosimetry on bridging plates." Laryngoscope 101:1-23, 1991  