A single large radiation dose is delivered to exposed tumors in intraoperative radiation therapy (IORT) and the verification of the prescribed dose delivered to the target is essential. In this study, TLD dosimeter is employed to measure the dose delivered to various locations in a treatment field during IORT. TLD ribbons were selected from a uniformity and performance tests and were annealed before use. The TLD chips were grouped into batches of 10. Measurement was performed for two IORT patients with brain tumor and pancreas cancer. Ribbons were sealed in thin sterilized plastic bags and ribbon packs were located in three different regions: under the field-shaping lead block, surface of the treated region, and tumor bed. Calibration was performed with an acrylic phantom at the depths of measurement. Care was taken to reconstruct the treatment geometry. TLDs and a parallel-plate ionization chamber were irradiated simultaneously to a calibration dose. Chip doses were calculated by entering the calibration dose and using the TL output data, the calibration factor. For the pancreas cancer patient, the tumor bed and surface dose were measured 97+/-4.7 and 108+/-6.9% of the prescribed dose, respectively. Dose delivered to the lead-protected region was less than 3% of the prescribed dose. For the other case, percent dose difference between the surface and tumor bed was less than 2%. The ratio of delivered dose of lead-protected area to that of surface was measured to be 7%. TLD is routinely used for *in-vivo* IORT dosimetry in our institution.