The conventional orthogonal film based 2D-brachytherapy provides the incomplete visualization and inaccurate reconstruction of multiple needles or catheters. We evaluated the CT based high dose rate (HDR) 3-D brachytherapy in 22 patients (12 prostate, 7 bronchi, 2 esophagi, and 1 head and neck). In prostate cases, 17 gauge hollow stainless steel needles (16-18) were placed transperineally through Syed/Neblett template using transrectal ultrasound guidance. Bronchial (5F) and esophageal catheters were placed through bronchoscope and upper endoscopy, respectively. A guide wire was inserted in these catheters for CT (5 mm) visualization. The distal and proximal extents of tumor treatment were determined from CT slices. The indexer length of each catheter or needle was measured on the basis of the most distal slice to be treated. The farthest distance up to which source could travel in each catheter or needle was determined by sending the dummy source in each needle or using source simulator ruler. Using PLATO (Nucletron) 3-D HDR treatment planning computer, the treatment dwell positions on the slices to be treated and the patient points on critical structures were marked. The CT reconstruction was done and isodose distribution were computed utilizing volume or distance optimization. The 3-D visualization of dose cloud allowed manipulation of normalization and optimization of 3-D plan so that the full coverage of tumor volume and sparing or minimal coverage of critical structures could be maximized. In conclusion, 3-D CT-based HDR brachytherapy is an accurate, fast, and practical technique for complex interstitial and intraluminal implants with multiple catheters.