

Supplementary Methods:

To assess optimal D_{RBE} and LETd threshold we evaluated all the thresholds with corresponding AUC values > 0.7 and then selected one with highest safe D_{RBE} and LETd (Figure 4). RILSN-free survival at $D_{RBE|LEM-I}$ cutoff = 64 Gy (RBE), in patients with $< 12\%$ voxels of sacral-nerves-to-spare receiving LETd < 55 keV/ μ m had significantly higher 2-year RILSN-free survival (100%) than those with LETd ≥ 55 keV/ μ m (75%) ($p < 0.05$). The sensitivity at $D_{RBE|LEM-I}$ cutoff = 64 Gy (RBE), and LETd = 55 keV/ μ m was 100% and specificity was 67%. Hence, $D_{RBE|LEM-I}$ cutoff = 64 Gy (RBE), and LETd = 55 keV/ μ m was considered appropriate predictor. Appropriate thresholds for whole sacral-nerves and cauda equina were selected following the same approach.