Sculpting Pear-shape Brachytherapy Dose

1. **In conventional intracavitary brachytherapy (Manchester system) for cervical cancer, a physician prescribes radiation dose to Point A. The followings are false except:**
   A. The revised Point A in 1953 introduced due to the considerable variations of original Point A locations
   B. The right and left locations of Point A represent clinical target points, so overdose, instead underdose, could be preferably allowed
   C. Conformal planning is limited when using CT datasets, and does not require CT datasets for dose calculation
   D. ABS in 2000 introduced a new Point H that is conceptually different from Point A with the aim of accounting for different cervix sizes
   E. ICRU report 38 defined rectum and bladder point doses are recommended to be less than 80% of brachytherapy prescription dose. Their point doses well represent maximum doses of OAR.

   **Answer:** C

   **Ref:**

2. **Conformal brachytherapy plans requires 3-D imaging datasets and are evaluated by DVH parameters not by point doses. The followings are true except:**
   A. The margin of CTV to PTV is recommended to 3-5 mm accounting for intra-/inter-scanning motions during CT or MR
   B. Institutional Point A dose is recommended to prescribe to target volume without changing fractionation scheme
   C. D90 values of target volumes are used for plan optimization and evaluation instead of D100.
   D. D2cc values of organs-at-risk (OAR) are used to evaluate OAR sparing
   E. In 3D imaging guided conformal brachytherapy, Point A doses and ICRU defined rectal and bladder doses are recommended to be reported.

   **Answer:** A

   **Ref:**

3. **MRI-guided, conformal brachytherapy has been overcoming challenges. The followings are true except:**
   A. The distortions on MRI have been reported as minimal but each institution still needs to verify before implementing MRI-guided brachytherapy
   B. To improve source-reconstruction accuracy, CT-MRI registrations are recommended
   C. Due to MR scan, applicators can be displaced more than a tolerable level, 3mm.
   D. Titanium applicators, along with plastic ones, can be used for MRI-guided Brachytherapy but artifacts need to be validated by each institution.
E. 2D image based planning is advantageous in terms of source-pathway reconstruction over CT / MRI guided brachytherapy. CT guided planning leads systematic 2-3mm error when a titanium applicator is used and source-pathway is simply reconstructed on CT images without verifying HU profile.

Answer: B


4. Early clinical outcomes of MRI-guided, conformal brachytherapy have been promising. The followings are true except;

A. The improvements of rectal, bladder and sigmoid sparing are depending on high risk CTV sizes when conformal plans are generated.
B. The dose volume parameters of conformal brachytherapy use radiobiologically normalized dose, equivalent dose in 2 Gy fraction of EBRT in order to account the doses from EBRT
C. When using current intracavitary applicators, MRI-guided, conformal brachytherapy allows clinicians to cover tumor with prescription dose for cervical cancer patients who are eligible for curative brachytherapy.
D. Inverse optimization itself is fast but volume optimization is recommended to be started from conventional Point A plans.
E. The recommended limits (D2cc < 70-75Gy) of rectum and sigmoid are lower than that of bladder (D2cc < 90Gy) while the dose limits of ICRU defined rectum and bladder points are same.

Answer: C

Answers
1. 3
2. 1
3. 2.


