

AbstractID: 11334 Title: Treating Ocular Melanoma with Eye Plaque Brachytherapy: COMS or NAG Eye Plaque?

Purpose: To compare dosimetry characteristics of Nag-eye plaque with COMS eye plaque using I-125 and Cs-131 brachytherapy sources.

Material and methods: Monte Carlo technique was used to generate 3D dose distributions of a 16-mm Nag eye plaque and 16-mm COMS eye plaque loaded with the I-125 and Cs-131 brachytherapy sources separately. The Nag eye plaque is a comparatively simpler eye plaque that uses fewer seeds than the COMS and does not require a Silastic seed carrier. The simulations were carried out with gold alloy plaques. A water equivalent seed carrier was used instead of the Silastic trough designed for the traditional COMS eye plaque. The Nag eye plaque used only eight sources forming two squares; the COMS eye plaque was loaded with thirteen sources forming three isocentric circles. A spherical eyeball 24.6 mm in diameter and an ellipsoid tumor 6 mm in height and 12-mm in diameter were used to evaluate the doses delivered.

Results: The doses along the eye plaque axis and the DVHs of the tumor were calculated. Our results indicated that, to achieve a prescription dose of 85 Gy at 6 mm from the inner sclera edge, the Nag eye plaque required 6.156 U/source for I-125 and 6.82 U/source for Cs-131; the COMS eye plaque required 4.015 U/source and 4.433 U/source for the same source types. The doses from two types of eye plaques on the central axis were almost the same at distances greater than 5 mm; the OSU-Nag plaque gave slightly larger doses than the COMS at distances less than 5 mm. The DVHs of the tumor showed that the NAG plaque tended to create slightly more hot dose regions than the COMS.

Conclusion: The dosimetric characteristic of Nag-eye plaque is comparable to COMS in using either I-125 or Cs-131 source.