3000—B98

Post-brachytherapy dynamics of uveal melanoma. J.J. Pe'er, I. Kaiserman, I. Anteby, I. Chowers, E.Z. Blumenthal, I. Kliers. Department of Ophthalmology, Hadassah University Hospital, Jerusalem, Israel.

Purpose: To analyzing the tumor mass dynamics of uveal melanoma post brachytherapy. **Methods:** 131 uveal melanoma patients with a mean age of 62 years (range 29-97) who were treated with RU-106 brachytherapy were included in the study. The patients were followed ultrasonically using both standardized A scan and B scan every 6.7+/-0.3 (mean+/-se) months (a total of 884 US exams). On average each patient was examined 6.8 times (range 3-17). The ultrasonic examination included measuring the tumors' base, height, reflectivity, regularity, vascularity and extra-scleral extension. In order to compare tumors of different sizes, all tumors were standardized to their size at brachytherapy. **Results:** At the time of brachytherapy the mean height of the tumors was 5.2mm (range 2.2-11.8) and the mean base size was 90.2 mm^2 (range 35-300). After brachytherapy almost all tumors responded by a decrease in height and base size. The decrease in height was at an initial rate of about 3% per month, which stabilized on a constant value (61%) after about 18 months. We fitted the dynamics of the high (h) decrease with various mathematical functions. The function that fitted best was a sum of a first order exponential decay and a constant ($h=61+35*e^{-0.12t}$ (t=time in months)). The half-life of this decay is 5.8 months. Tumors of larger sizes had a faster initial decrease in height and stabilized on a lower percentage of their initial height. Thus, the half-life of the height decay was 5.3 months for small tumors (2-4mm) while it was 3.3 months for the large tumors (>8mm). The small tumors stabilized on 70% of their initial height while the large ones on 49.5%. **Conclusions:** The post-brachytherapy dynamics of uveal melanomas resembles a function composed of the sum of a constant and a first order exponential decay, suggesting the possible existence of 2 types of cell populations - one not affected by brachytherapy and another with a constant probability in time to be damaged by the treatment. This can implicate that the post brachytherapy death of each tumor cell is a stochastic markovian process and it is independent of the death of other tumor cells.

CR: None