Establishment of an orthotopic xenograft retinoblastoma nude mouse model by intravitreal injection of human RB Y-79 cells and histological follow up

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Abstract:

Retinoblastoma (RB), is the most frequent primary intraocular tumor in children which if left untreated, can cause death. Preclinical animal models that mimic molecular, genetic and cellular features of cancers are essential for studying cancer and searching for promising diagnosis and treatment modalities and can also help to understand tumor biology, screening of new drugs and studying new ways of drug administration.

To develop animal models of retinoblastoma that accurately resembles metastatic and non-metastatic form of the human disease, we injected human retinoblastoma Y79 cells intravitreally in both eyes of 6 BALB/c nude mice (male,5 weeks old), The incidences of retinoblastoma were analyzed by hematoxylin/eosin (HE) staining. Additionally, one injected nude mouse was kept for a longer period of time in order to study histological examination for potential metastases.

Eyes were monitored morphologically every week for five weeks, tumor growth resulted in swelling of the eyes in individual animals. 8 weeks after injection histological analysis was performed and showed that Y79 retinoblastoma cells formed intraocular tumors that were initially confined to the vitreous cavity. Tumors progressively invaded the retina, subretinal space and anterior chamber of the eyes. The model described here has several advantages. It is readily available, easily established, and easy to work with. The existence of an in vivo model may offer new opportunities for the further cellular and molecular analysis of a human intraocular tumor.

Key words: Retinoblastoma, Xenograft, Mouse model, Histology