

Abstract

Are laryngeal papilloma virus-infected cells viable in the plume derived from a continuous mode carbon dioxide laser, and are they infectious? A preliminary report on one laser mode.

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The purpose of this study was to determine the potential risk of transmitting viable viral infected cells as well as viral infectivity of laryngeal papilloma in the plume derived from a continuous mode carbon dioxide laser. Each of 10 juvenile recurrent laryngeal papilloma specimens was divided into two equal parts, and one part was irradiated with a carbon dioxide laser employing a continuous mode at the power setting of 10 watts with 0.5 mm spot size and a power density of 1667 W/cm². The resultant laser plume was trapped and was cultured simultaneously with the other part of the specimen which served as the control. All irradiated specimens tested yielded negative culture results while all the control counterparts revealed viable cell growth. To detect the viral infectivity, laser plume was cultured with two separate cell systems, one was the porcine PS clone D cell line and the other normal mucosal cells obtained from the same patient, and to control these systems both cell lines were also designed to be infected with polio virus. Both cell lines in the viral infectivity testing systems revealed no sign of viral infection. The results suggest that papilloma virus-infected cells cannot survive the continuous mode of carbon dioxide laser irradiation. We primarily conclude that, to avoid airborne transmission of plume containing laryngeal papilloma viral-infected cells and infectious viral particles, the carbon dioxide laser parameters should be in a continuous mode with the power density equal to, or more than, 1667 W/cm².