Purpose: to assess the response of EBT2 Gafchromic film* to stresses that might be imposed on the film when used as an in-vivo dosimeter. The following stress factors were investigated: bending the film; compression; and the shearing that occurs when cutting the film.

Methods: For bending stress, the film was rolled into cylinders of various radii, submerged in water, and exposed to X-rays. For compression, 64 cm^2 pieces of the film were sandwiched within a stack of solid water and weights were placed on top of the solid water in order to compress the film while being exposed to X-rays. For artifacts that arise from cutting the film, pieces of the film were cut either with scissors or a paper cutter. The cut film was then exposed uniformly and shearing artifacts introduced from cutting the film were identified. The effects of 'light piping' from the cut edges of the film were also investigated. A felt tip pen was used to darken the cut edges in order to mitigate light piping. The film was scanned with an Epson 10000 XL scanner in transmission mode and images in the red spectrum were analyzed.

Results: At 200 cGy exposures, a compression corresponding to 0.6 kg/cm^2 'weight pressure' had less than a 2% influence on the film's response. Bending the film had a larger influence, >5%, when the radius of curvature was 1 cm. Also, larger artifacts were identified when the film was cut with scissors and the cut edges were not darkened with a pen.

Conclusions: EBT2 film can readily be used as an in-vivo dosimeter within the compression and dose ranges investigated. The user should avoid cutting the film with scissors, and also avoid excessively bending the film.

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