

## Early-stage esophageal squamous cell carcinoma treated with californium-252 neutron brachytherapy: clinical report on 16 cases

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### ABSTRACT

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**Aims and background.** Californium-252 (<sup>252</sup>Cf) neutron brachytherapy is a form of high linear energy transfer radiotherapy, which has proven effective when used in combination with external beam radiotherapy to treat intracavitary cancers of the cervix, colon/rectum and esophagus. No study has been reported for treatment of intracavitary cancers with neutron brachytherapy alone. The aim of the study was to observe and analyze the long-term curative effects and complications for early stage thoracic esophageal cancer patients treated with neutron brachytherapy alone.

**Methods.** From December 2001 to August 2006, 16 patients of early stage squamous cell carcinoma underwent neutron brachytherapy. The total radiation dose to the reference point was 20-28 Gy-eq in 5 to 7 fractions with 4 Gy-eq/fraction. The 1-, 3-, and 5-year follow-up rates were 100%.

**Results.** The 2-, 3-, 4-, and 5-year survival rates were 100%, 87.5%, 87.5%, and 75%, respectively. The early complication rates for grades 1 and 2 radiation esophagitis were 75% and 25%, respectively. The late complication rates for grades 0 and 1 (according to the RTOG/EORTC standard) were 87.5% and 12.5%, respectively. Barium esophagography after treatments confirmed that the complete response rate was 100%. Fourteen patients were confirmed by endoscopy to have either normal mucosa or inflammation change.

**Conclusions.** Neutron brachytherapy alone was an effective and safe treatment for early stage esophageal squamous cell cancer.

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**Key words:** early stage thoracic esophageal cancer, neutron brachytherapy, relative biological effectiveness.

*Conflict of Interest:* None.

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