

Directional LDR Intraoperative Brachytherapy for Head and Neck Cancer

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PURPOSE

This study investigated the feasibility of using intraoperative directional brachytherapy for treatment of squamous cell carcinoma of the oropharynx. The patient had received a prior course of external beam therapy of 70 Gy in 2015. Due to positive margins near the carotid after the resection, and the increased risk of additional external radiation, brachytherapy was considered as a treatment option.

METHODS

CivaSheet[®] (CivaTech Oncology, Inc., Durham, NC), a flexible, bio-absorbable polymer membrane embedded with an array of discrete ¹⁰³Pd sources, was utilized for the implant. The ¹⁰³Pd sources were spaced 8 mm apart on a rectangular grid. Unidirectional dose was achieved by a 0.05 mm thick gold disk-shaped foil on the reverse side of each source. A dose of 120 Gy at 5 mm depth was prescribed.

After the resection, the entire polymer sheet was placed on the treatment area in the patient to determine the needed dimensions. The CivaSheet[®] was then removed and easily cut to size with scissors leaving 26 ¹⁰³Pd sources remaining. The surgeon used 3.0 vicryl sutures for attachment in a concave shape over the carotid artery, where there was a positive margin. The gold foil was positioned to protect the neck flap and closure.

The surgical team completed the procedure and the patient recovered without any problems.

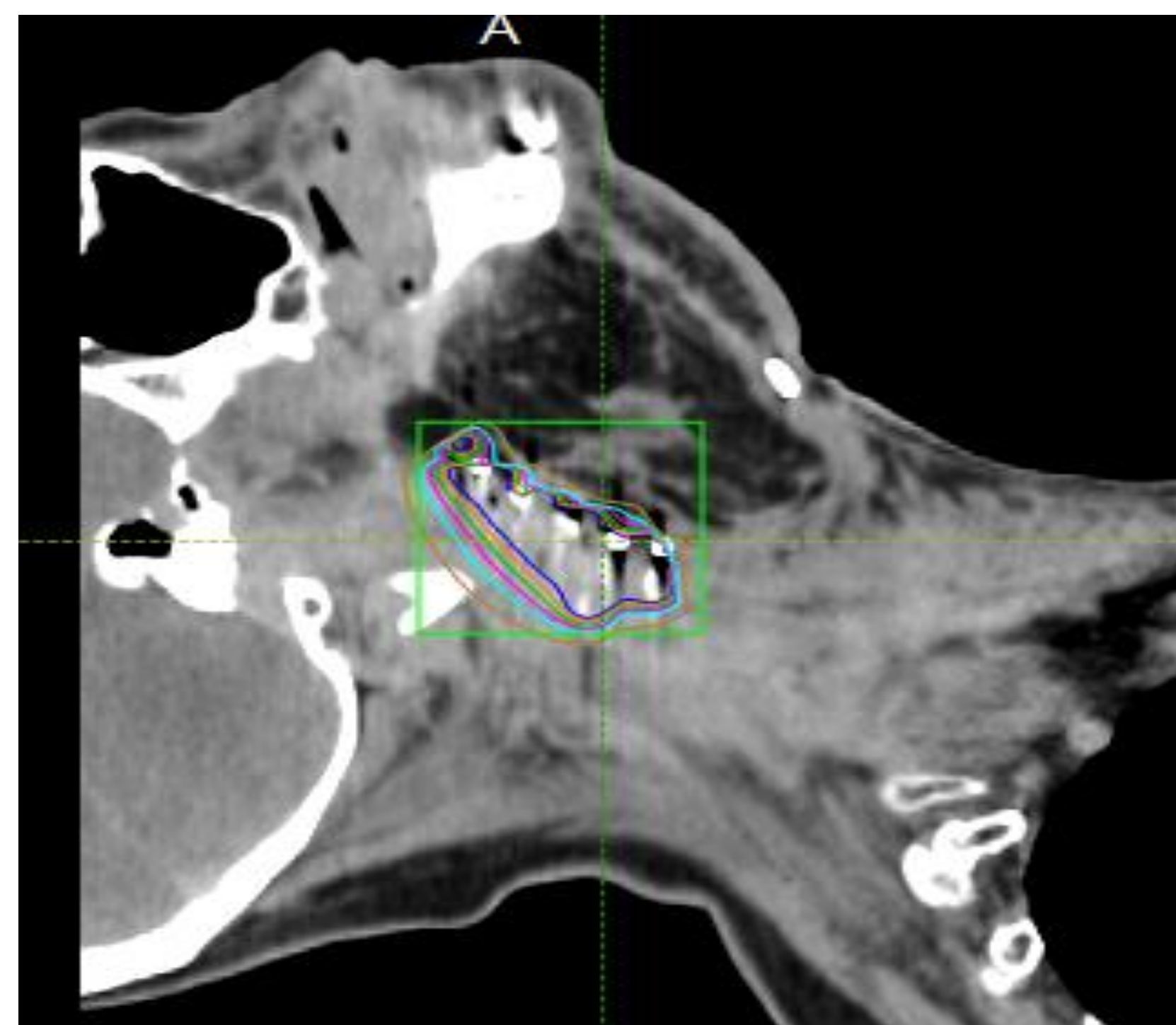


Figure 1: Sagittal View of Civasheet[®]

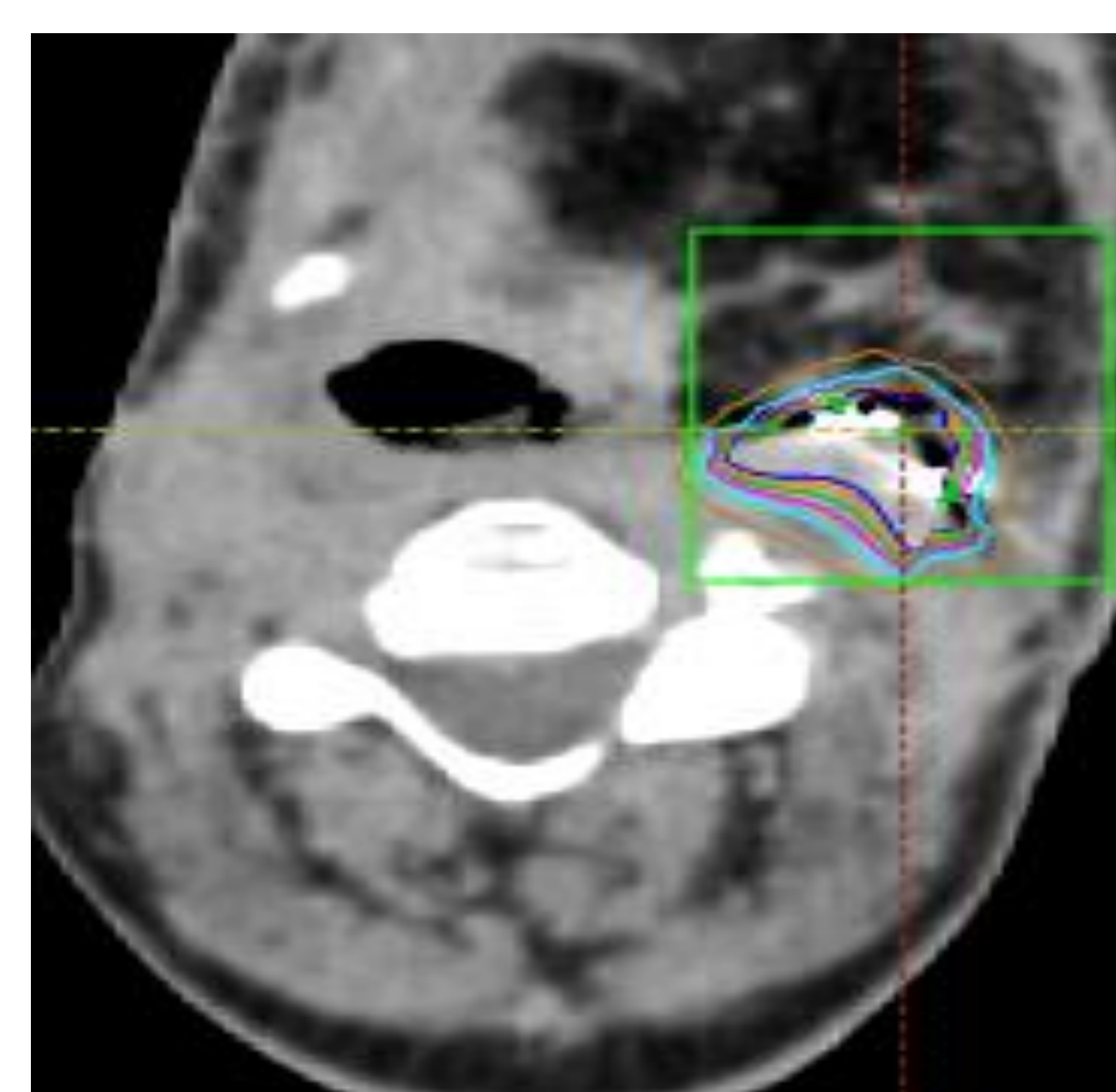


Figure 2: Transverse View of Civasheet[®]



Figure 3: Gold side of Civasheet[®] facing anterior and "hot" side against carotid

RESULTS

The patient received a CT scan in the radiation oncology department. The images were transferred to the Varian Variseed[™] computer for a post-implant treatment plan. The treatment plan indicated that the sources remained in position in a concave array pattern. Due to the dose fall-off of ¹⁰³Pd, the calculated dose to critical structures was minimized.

CONCLUSIONS

The surgical implant of the sheet proceeded as expected with no complications. The post-implant plan indicated that the CivaSheet[®] remained in position with the radioactive side contacting the treatment area, and minimal dose to adjacent structures. Directional LDR intraoperative brachytherapy is a feasible treatment strategy for positive margins near the carotid artery.

CONTACT INFORMATION

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