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Radiolucent carbon-fiber reinforced pedicle screws for the treatment of spinal tumors: Advantages for radiation planning and follow-up imaging

Florian Ringel, Yu-Mi Ryang, Jan S. Kirschke, Birgit S. Müller, Jan J. Wilkens, Jeremy Brodard, Stephanie E. Combs, Bernhard Meyer

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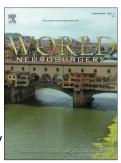
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- ACCEPTED MANUSCRIPT Radiolucent carbon-fiber reinforced pedicle screws for the treatment of 1 spinal tumors: Advantages for radiation planning and follow-up imaging 2 Florian Ringel<sup>1,4</sup>, Yu-Mi Ryang<sup>1</sup>, Jan S. Kirschke<sup>3</sup>, Birgit S. Müller<sup>2</sup>, Jan J. Wilkens<sup>2</sup>, Jeremy 3 Brodard<sup>1</sup>, Stephanie E. Combs<sup>2,5</sup>, Bernhard Meyer<sup>1</sup> 4 5 Departments of <sup>1</sup>Neurosurgery, <sup>2</sup>Radiation Oncology and <sup>3</sup>Neuroradiology, Klinikum rechts 6 7 der Isar, Technische Universität München, Ismaninger Str. 22, 81675 Munich, Germany <sup>4</sup>Department of Neurosurgery, University of Mainz, Langenbeckstr. 1, 55131 Mainz, Germany 8 <sup>5</sup>Institut für Innovative Radiotherapie (iRT), Department of Radiation Sciences (DRS), 9 Helmholtz Zentrum München HMGU, Ingolstädter Landstr. 1, 85764 Neuherberg, Germany 10 11 Email-addresses and highest academic degrees: 12 F. Ringel, MD: florian.ringel@tum.de Y. Ryang, MD: <a href="mailto:yu.ryang@tum.de">yu.ryang@tum.de</a> 13 J. Brodard, MD: jeremy.brodard@tum.de B. Müller, PhD: birgit.mueller@tum.de 14 J.J. Wilkens, DSc: wilkens@tum.de 15 Jan Kirschke, MD: jan.kirschke@tum.de S. Combs, MD: <a href="mailto:stephanie.combs@tum.de">stephanie.combs@tum.de</a> B. Meyer, MD: <u>bernhard.meyer@tum.de</u> 16 17 Corresponding author: 18 Florian Ringel, Phone: +49-6131-17-7331, Fax: +49-6131-17-2274 19 20 Email: florian.ringel@unimedizin-mainz.de

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- 23 Carbon fiber, pedicle screws, spinal chordoma, spinal metastasis, spinal radiation, spinal
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