

Accepted Manuscript

Design and application of a novel patient-specific 3D printed drill navigational guiding template in atlantoaxial pedicle screw placement

Xinwei Pu, MD, Mengchen Yin, MD, Junming Ma, MD, Yujie Liu, MD, Guanghui Chen, MD, Quan Huang, Guoquan Zhao, MD, Tingsheng Lu, MD, Shudan Yao, MD, Qinlin Chen, MD, Chunshan Luo, MD

PII: S1878-8750(17)31965-4

DOI: [10.1016/j.wneu.2017.11.042](https://doi.org/10.1016/j.wneu.2017.11.042)

Reference: WNEU 6873

To appear in: *World Neurosurgery*

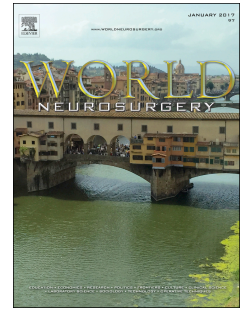
Received Date: 12 September 2017

Revised Date: 5 November 2017

Accepted Date: 7 November 2017

Please cite this article as: Pu X, Yin M, Ma J, Liu Y, Chen G, Huang Q, Zhao G, Lu T, Yao S, Chen Q, Luo C, Design and application of a novel patient-specific 3D printed drill navigational guiding template in atlantoaxial pedicle screw placement, *World Neurosurgery* (2018), doi: 10.1016/j.wneu.2017.11.042.

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Authors

Xinwei Pu^{a,#}MD, Mengchen Yin^{b,#}MD, Junming Ma^{b,#}MD, Yujie Liu^{c,#}MD, Guanghui Chen^{d,#}MD, Quan Huang^c, Guoquan Zhao^aMD, Tingsheng Lu^aMD, Shudan Yao^aMD, Qinlin Chen^aMD, Chunshan Luo^{a,#}MD

^a Department of Orthopaedics, Guizhou Province Osteological Hospital, Guizhou, China.

^b Department of Orthopaedics, LongHua Hospital, Shanghai University of Traditional Chinese Medicine, Shanghai, China

^c Department of Bone Tumor Surgery, Changzheng Hospital, Second Military Medical University, Shanghai, China

^d Department of Orthopaedics, Shanghai pudong new district people's hospita, Shanghai, China.

Corresponding author.

Chunshan Luo, DO, MD.

Department of Orthopaedics, Guizhou Province Osteological Hospital, Guizhou, China.

E-mail: lyz8088@163.com

Xinwei Pu, Mengchen Yin, Junming Ma, Yujie Liu and Guhuanghui Chen contributed equally to this work.

Introductions

Internal fixation of atlantoaxial pedicle screws via posterior approach is a gold-standard surgery for atlantoaxial fracture, dislocation and disability. Due to the complex adjacent structure of the atlantoaxial vertebra, the high risk of blood vessel and nerve damage restricts its domain of application. Screwing determines the success or failure of the surgery. In recent years, with the promotion of 3D printing technology in the medicine, pedicle navigation template has been gradually used in spinal surgery for its high accuracy of screwing.[1-3] There are also some disadvantages, such as: shaking or dislocated navigation template leads to screwing derivation; fine guide plate is not easy to control and fix; the navigation template is prone to deformation after high-temperature disinfection; the navigation template is fragile and easy to be damaged during the application. At present, most studies focus on the accuracy of the 3D-printing-navigation-template-assisted placement of atlantoaxial pedicle screws, and few on the accuracy and clinical curative effect. In

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