

76. UTILITY OF INDIVIDUALISED 3D PRINTER MODEL IN PREVENTION OF TRANSCUTANEOUS VERTEBROPLASTY COMPLICATIONS

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Introduction. Percutaneous vertebroplasty is an emerging interventional technique in which surgical polymethylmethacrylate is injected via a large bore needle into a vertebral body under imaging guidance. This technique is used in the management of osteoporotic and malignant vertebral fractures.

Aim of study. The purpose of this article is to describe complications arising from the procedure, and to see whether using customised 3D printer models for preoperative planning might help prevent complications during percutaneous vertebroplasty.

Methods and materials. We have reviewed the literature concerning percutaneous vertebroplasty complications. Further, 5 cases of vertebral body compression fractures were retrospectively selected from our database that had postoperative complications. The 3D-print model was made by using CT-Scan images to determine if avoiding intraoperative complications were possible.

Results. From our 5 selected cases, 3 patients (in 60 %) had cement extravasation in soft tissues and 1 patient had paraplegia. By analysing preoperative CT and intraoperative surgical protocol, the angulation and point of entry were compared. In 2 patients the point of entry was 4mm more medial and the angulation was 10 degree more lateral. In 1 patient, the vertebral body defect was neglected but seen on a 3D model. By using a different point of entry, postoperative complication could be avoided. At 2 patients had extravasation of cement into the paravertebral veins and can lead to pulmonary embolism.

Conclusion. Preoperative planning with 3D-print models can significantly improve the accuracy, shorten the operation time, and reduce the number of fluoroscopies, which eventually leads to less postoperative complications. Background Conventional percutaneous vertebroplasty is mainly guided by C-arm fluoroscopy, and it usually leads to excessive X-ray radiation exposure to patients, surgeons, and anaesthetists. Moreover, multi-time fluoroscopes may prolong the operation time. 3D-printed template could help minimise fluoroscopy shot times and fluoroscopy dosage during operation, and shorten operation time. We will compare the efficacy and accuracy of Percutaneous vertebroplasty assisted by “three-dimensional printed individual guide template” versus conventional Percutaneous vertebroplasty.