

Computer-unterstützte perkutane muskuloskeletale Interventionen

Computer-assisted percutaneous musculoskeletal interventions

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Purpose

Our purpose was the development and evaluation of a novel patient immobilization device and a novel aiming device (Medical Intelligence, Germany) for frameless stereotactic interventional procedures in various body regions.

Material and Methods

For the CT scan the patient is placed upon a vacuum mattress, wrapped up with special cushions and covered with a plastic sheath. When the vacuum pump is turned on the cushions harden and the patient is sucked against the CT couch resulting in patient immobilization. The pathway to the target point is determined on the 3D – CT dataset on the Treon navigation system (Medtronic, USA). After sterile draping the Vertek aiming device allows for precise alignment of the probe of the navigation system with the preplanned trajectory. The needle is advanced through the targeting device to the target. The novel technique was used in 61 patients for various reasons including bone-tumour biopsies, vertebral-disc biopsy, retrograde drilling of osteochondral lesions and percutaneous fixation of pelvic fractures.

Results

Depending on the depth of the lesion image-fusion revealed a needle displacement within 1-5,5 mms (mean 3D accuracy: 2,8 mm) in all patients. The whole procedure including

immobilization, general anaesthesia, adjustment of the targeting device and tissue sampling took about 1-2 hours per patient.

Conclusion: Application of navigation systems in combination with the novel devices allows for precise puncturing of different targets in the body. The novel technique allows for localization of very small lesions in the whole body.



