

Case 13

Screw Placement and Pelvic Osteoplastie Under CT – Fluoroscopic Guidance

By Ralf-Thorsten Hoffmann, MD*, Bianca Beyer, MD**, Tobias F. Jakobs*, Maximilian F. Reiser, MD*

*Department of Clinical Radiology, University of Munich, Campus GroBhadern, Munich, Germany

**Department of Surgery, University of Munich, Campus GroBhadern, Munich, Germany

HISTORY

A 68-year-old male patient with a history of renal cell carcinoma 4 years prior, presented in the department of radiology. Due to pelvic pain occurring during his follow-up, a MSCT of the pelvis was obtained.

DIAGNOSIS

The examination showed a large osteolysis in the sacrum and the adjacent iliac bone (Fig. 1). Furthermore, a pathological fracture was detected as stigmata of the recurring tumor.

After an inter-disciplinary case discussion, the decision was made to treat the patient with a combination of angiographic embolization of the strongly vascularized tumor, followed by CT guided placement of two screws supported by

a CT guided osteoplasty during the same treatment session.

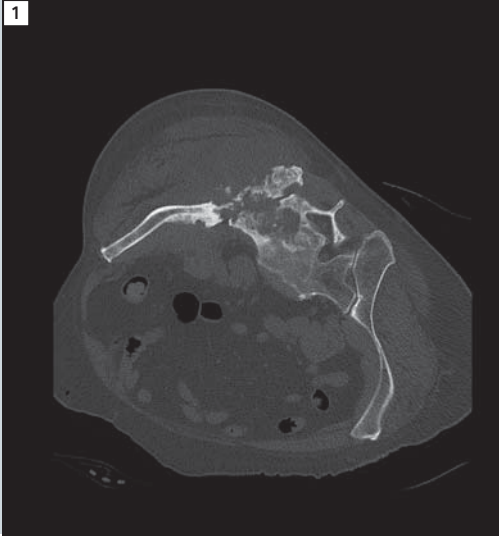
COMMENTS

After placing the patient in a stable lateral position with the help of a vacuum bed, a CT scan was performed using the i-Spiral mode. The correct positioning of the screws was planned on axial images. Furthermore, path planning and calculation of the screw length was performed on the automatically obtained 3D images using the needle oriented view. The following procedure was monitored by repeated control with i-Fluoro mode. By using Hand CARE mode, K-wires were positioned through small skin incisions by the interventional radiologist under CT fluoroscopic guid-

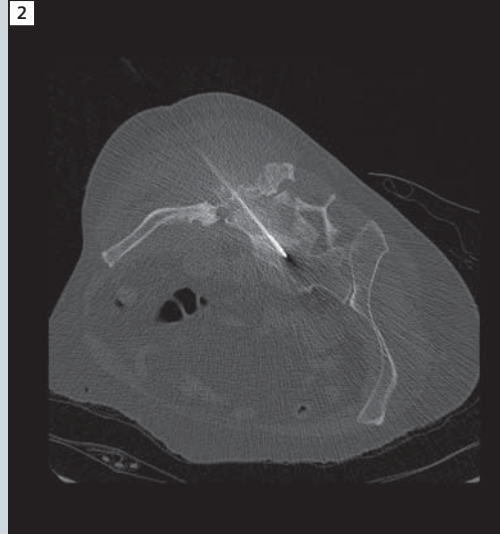
ance using the i-Fluoro mode (Fig. 2). The screws were placed via K-wires by the surgeon in order to avoid a too deep insertion of the screw head into the weakened bone (Figs. 3A-B). A major support for these control scans is the One Click Table Position, bringing the patient back to the exact same position, avoiding additional fluoroscopic CT examination. Procedure times and radiation exposures are thereby significantly reduced. After the insertion of two screws, (Fig. 4) the next step was the insertion and positioning of two vertebroplasty canulas into the osteolysis and application of the PMMA cement under CT fluoroscopic guidance by the radiologist using the needle artefact reduction tool i-Needle Sharp (Figs. 5A-B).

EXAMINATION PROTOCOL

Scanner	SOMATOM Definition		
Scan area	pelvis	Rotation time	0.5 s
Scan length	4.8 mm	Slice collimation	12 x 1.2 mm
Scan time	i-Fluoro	Slice width	4.8 mm
Tube voltage	120 kV	Reconstruction kernel	B50s
Tube current	25 Eff. mAs	Postprocessing	Intervention Pro
CTDI vol	289 mGy		Adaptive 3D Intervention



1 The CT examination showed a large osteolysis in the sacrum and the adjacent iliac bone.



2 K-wires were positioned under CT fluoroscopic guidance using the i-Fluoro mode.



3 The screws were placed via K-wires in order to avoid a too deep insertion of the screw head into the weakened bone.



4 Two screws were inserted into the broken pelvic bone.



5 Two vertebroplasty canulas were inserted and positioned into the osteolysis (Fig. 5A) and PMMA cement was supplied under CT fluoroscopic guidance using i-Needle Sharp (Fig. 5B).

