Intraoperative and dynamic 3D rotational X-ray imaging
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Chapter 10

General Conclusions
The BV Pulsera with 3D-RX provides a practical solution for intra-operative 3D imaging during surgery because it is based on a mobile C-arm system. The imaging quality of 3D-RX approximates that of MSCT for imaging of even the smallest bony structures in terms of spatial resolution and contrast to noise ratio. The geometry limits, however, application of this system to extremities, and the head and neck.

Because it gives certainty about the relative position of implants and bony parts during surgery 3D-RX has added great value during complex operations such as cochlear implantation. The technique provides more information than conventional 2D fluoroscopy imaging and visual inspection. The extra surgery time and radiation dose is generally justified by the added precision. In addition, revision surgery is sometimes avoided.

We also developed a four-dimensional X-ray technique that allows imaging of periodic motion in 3D. Despite the presence of noise and suboptimal sampling, anatomical structures of the wrist can be clearly identified. Image registration allows then accurate and non-invasive measurement of the motion patterns of the carpal bones. The method distinguishes itself by measuring dynamically and in vivo, and is the first technique to detect complex motion such as hysteresis in the wrist.
General Conclusions