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Patient Specific Instruments for Complex Tumor Resection-Reconstruction Surgery within the Pelvis: A Series of 4 Cases

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Abstract
The pelvis bone resection-reconstruction surgery is one of the most challenging fields in orthopedics. Being applied for tumors, as for other complex reconstruction cases, this type of surgery needs careful planning and is time consuming, in order to obtain proper accuracy. Unfortunately not all the time the expected accuracy is met, with consequences for the patients. PSI proved to provide good cutting accuracy during simulated tumor surgery within the pelvis. This article present a series of 4 patients operated in our department between June 2014 and Mars 2015 for tumors resection-reconstructions. The patients were imaged using a CT and an MRI scan and the images were reconstructed in 3D. According to the bone bank stock, the most similar allograft was chosen and the stored CT scan was reconstructed in 3D. Patient specific instruments (PSI) were designed and manufactured using rapid-prototyping technology for the resection of the native tissues as for the resection of the careful selected hemipelvic allografts. Allografts' fitting to the pelvis of the patients was excellent and allowed stable osteosynthesis.
Key words: resection-reconstruction surgery, pelvis