Abstract:
Proximal humerus fractures treated with intramedullary nails show good results. However, the correct anatomical reconstruction of four-part fractures is demanding especially when using intramedullary nails. We therefore compared different intramedullary nail designs for the proximal humerus in a virtual morphological manner. Three commercially available nailing systems where virtually implanted in virtually generated reproducible four-part fractures of 25 digitised humeri. The objective of this study was to quantify and characterise the anatomical position of the proximal screws in the most vulnerable case of a four-part fracture. Taking into account a minimum distance of 5mm between the screw head and the fracture line, osteosynthesis was possible in 54 out of 75 cases. Difficulties placing the proximal screws could be observed at the localisation of the lower lesser tubercle or/and at the sulcus intertubercularis. This morphological analysis could be the basis for choosing the most sufficient implant intraoperatively or even improving the nail design.