The aim of this study is to evaluate the accuracy of a surgical template-aided implant placement produced by rapid prototyping using a DICOM dataset from cone beam computer tomography (CBCT). On the basis of CBCT scans (Sirona® Galileos), a total of ten models were produced using a rapid-prototyping three-dimensional printer. On the same patients, impressions were performed to compare fitting accuracy of both methods. From the models made by impression, templates were produced and accuracy was compared and analyzed with the rapid-prototyping model. Whereas templates made by conventional procedure had an excellent accuracy, the fitting accuracy of those produced by DICOM datasets was not sufficient. Deviations ranged between 2.0 and 3.5 mm, after modification of models between 1.4 and 3.1 mm. The findings of this study suggest that the accuracy of the low-dose Sirona Galileos® DICOM dataset seems to show a high deviation, which is not useable for accurate surgical transfer for example in implant surgery.