Evaluation Of The Accuracy Of Templating Before Canine Total Knee Replacement

Adheip Prabakaran[1]
Laurent Guiot[2] and Denis Marcellin-Little[3]
[1] Small Animal Specialist Hospital, Central Coast
[2] ACCESS Specialty Veterinary Hospitals
[3] School of Veterinary Medicine, University of California

The aim was to compare the accuracy of templating radiographs and computed tomography (CT) for predicting femoral prosthesis size in canine total knee replacement (TKR). The secondary aim was to compare the accuracy of the femoral prosthesis alignment and fit in the sagittal and frontal planes using each templating modality.

Preoperative radiographs, CT and postoperative radiographs were collected from 18 dogs that underwent TKR at a single institution. The femoral prosthesis was templated using orthogonal radiographs and CT images following segmentation. Anatomic and mechanical angles were measured for preoperative templated radiographs and CTs, and postoperative radiographs.
There was no difference in prediction of femoral implant size with radiographs or CT. Each group accurately predicted implant size in 12 out of 18 cases. There were more angular errors in the CT group in the frontal plane whereas there were more angular errors in the radiograph group for angles in the sagittal plane. The mean differences from Bland-Altman analysis ranged between -2.66 and 1.44 degrees for angular measurements.
We concluded that templating method had no effect on accuracy for prediction of prosthesis size in canine TKR. There was minimal difference in anatomic and mechanical alignment of the femoral prosthesis between groups. The authors conclude that 2D and 3D templating techniques are acceptable planning methods for TKR, but only accurately predict femoral prosthesis size in 66% of cases. It is therefore recommended that surgeons have a prosthesis available one size above and one size below the predicted size when performing TKR.

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