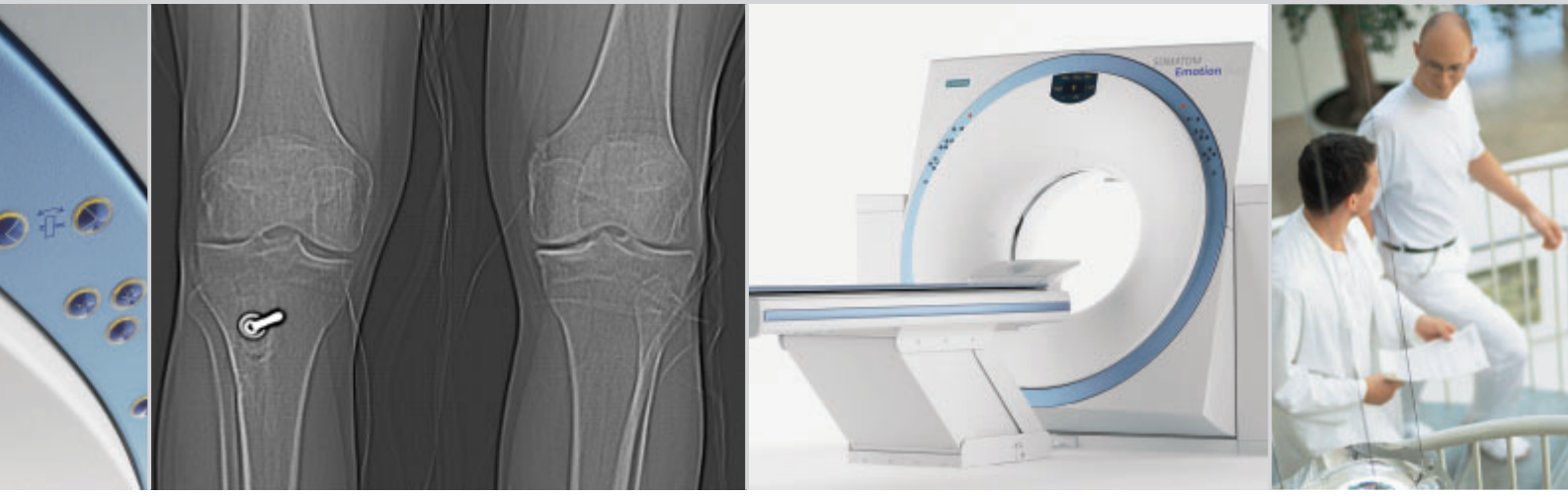
Case Study



Extremity CT –
Orthopaedic Knee Imaging

3D visualizing of the knee for individual prosthesis planning

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Extremity CT –
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3D visualizing of the knee for individual prosthesis planning

Patient History

A 53-year-old patient was presented for a CT examination of the knee. The examination was performed to evaluate the degenerative changes in the patellofemoral joint and for the planning of a patellofemoral prosthesis. A high resolution CT of the knee was performed, along with Multi-Planar Reformation (MPR) and Volume Rendering Technique (VRT) using the acquired spiral data set.

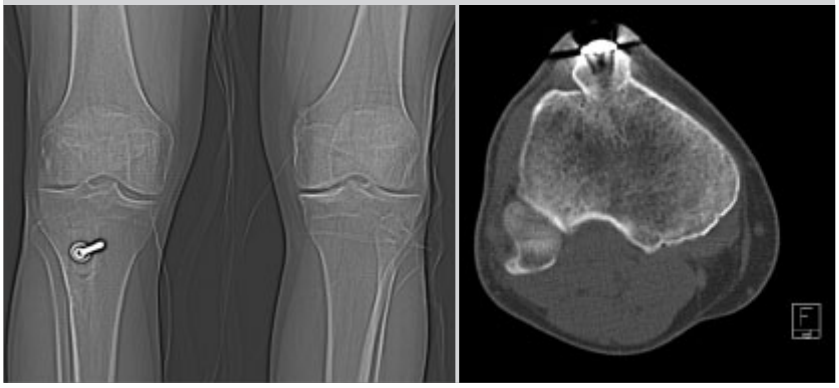
Examination Protocol

Scanner	**SOMATOM Emotion Duo**
Scan area	*From distal femur to proximal tibia*
Scan length	*25.6 cm*
Scan direction	*Cranio-caudal*
kV	*130 kV*
Effective mAs	*50 mAs*
Rotation time	*1 s*
Slice collimation	*2 x 1 mm*
Slice width	*1.25 mm*
Table feed/rotation	*2 mm*
Pitch	*2*
Reconstruction increment	*0.6 mm*
Kernel	*B80*

Contrast	*No contrast media was used*

Post processing	*Multi-Planar Reformations (MPR), Volume Rendering Technique (VRT)*

[1] Axial images (A) complemented by coronal (B) and sagittal (C) reformats allows the complete visualization of the patella in relationship to the femur. The full amount of osteoarthritis can be observed



[2] Localization of tibial screw

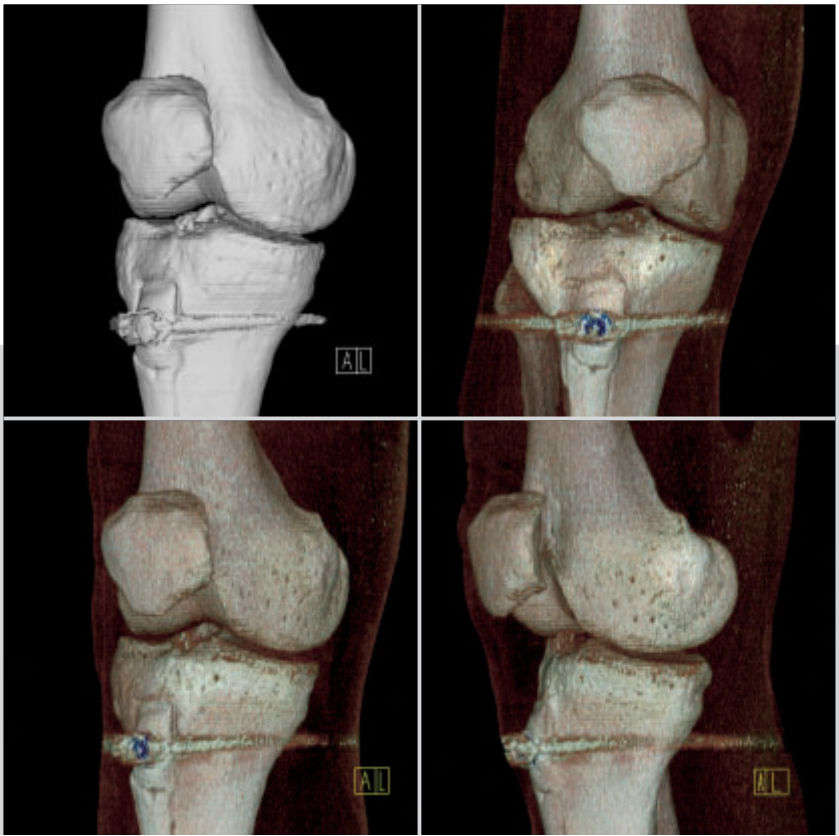
Diagnosis and Comments

The use of axial scans complemented by coronal and sagittal reformats allows the complete visualization of the patella in relationship to the femur [1]. The degenerative changes in the knee were easily depicted whilst the patellofemoral osteophytes were clearly visualized.

It was considered feasible that a patellofemoral replacement would be suitable in this patient. This was due to the presence of the osteophytes that were encroaching on the patellofemoral joint.

The presence of a tibial screw from previous surgery was also easily identified [2]. The screw in the tibial tubercle region was able to be demonstrated in relation to the entire knee joint with the use of VRT. This also allowed the prosthetic manufacturer to visualise the patella in relation to the femur as well as the entire knee [3].

From the axial, sagittal and coronal images, the prosthesis was able to be custom-made so as to prevent the patient experiencing patellar tracking difficulties. The prosthesis was made to the correct size so as to sit in the trochlea of the femur. It must be able to function in the same manner as a “normal” patellofemoral joint.



[3] The use of VRT allows a detailed planning for the manufacturing of custom-made prosthesis in orthopaedic surgery procedures/practice

Author:

Cameron Robertson
South Coast Xray
341-349 Crown St Wollongong 2500
Australia
Ph 02 42280055

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Siemens AG, Medical Solutions
Henkestr. 127, D-91052 Erlangen
Germany
Telephone: +49 9131 84-0
www.siemens.com/medical

Siemens AG, Medical Solutions
Computed Tomography
Siemensstr. 1, D-91301 Forchheim
Germany
Telephone: +49 9191 18-0

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