LUMC RSAcore Department of Orthopaedics

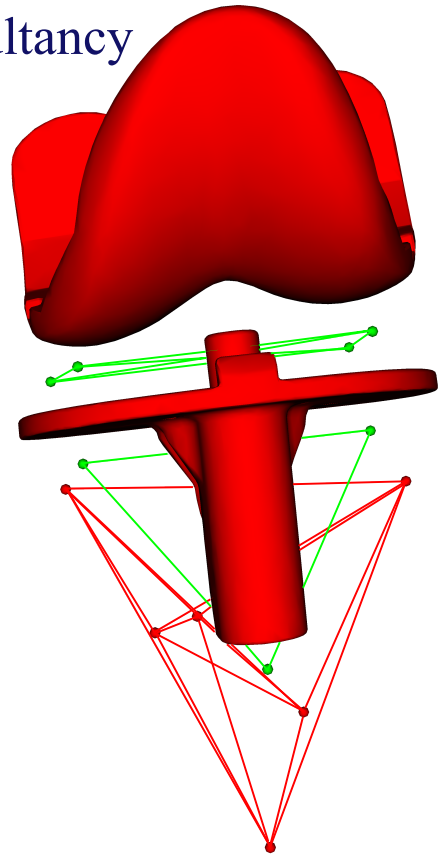
Roentgen Stereophotogrammetric Analysis

Model-based RSA

Model-based RSA Software

Study Support

Consultancy



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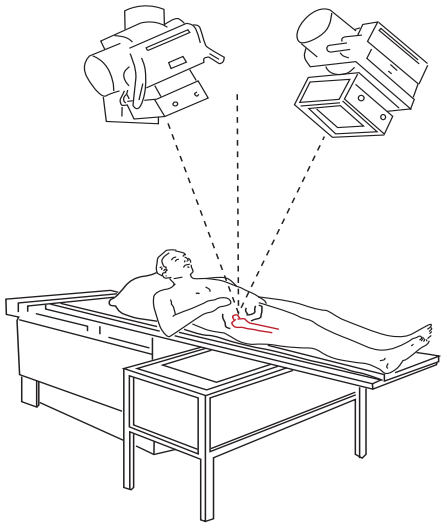
Accurate technique for 3D migration assessment

Aseptic mechanical loosening is the major factor for prosthesis failure. This loosening starts with progressive migration of 0.2 - 1.0 mm of the prosthesis. Early migration can be detected accurately with RSA making evaluation of new prosthesis design or different fixation techniques is possible in small patient groups. Publications have shown that the 2-year migration results have a predictive value for early prosthesis failure.

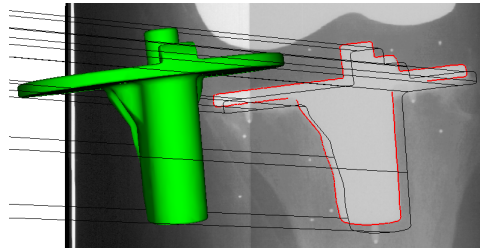
Tantalum markers inserted in the bone during surgery form a rigid body that serves as the reference to which the migration of the prosthesis is calculated.

Two roentgen images are made simultaneously while the patient is positioned over a calibration box. The calibration box defines the 3D position of the roentgen sources and it calibrates the entire setup.

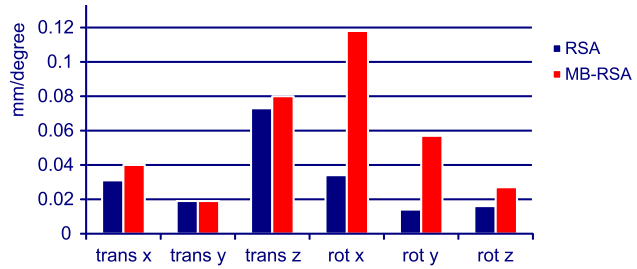


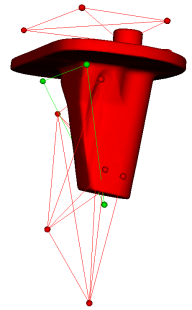
Model-based RSA software detects marker projections and prosthesis contours automatically. When several follow-up moments are analyzed, the migration of the prosthesis with respect to the bone can be calculated with sub-millimeter accuracy.

Model-based RSA calculates the position and orientation of the prosthesis by matching the projected contours of the 3D surface model to the detected contours in the roentgen images. The 3D position of the reference bone is obtained by means of the bone markers.



Several studies have shown that Model-based RSA has good clinical accuracy.





3D viewing

Multiple RSA follow-up moments can be loaded in the software at the same time and visualized in 3D.
By aligning bone markers, the actual migration of the prosthesis with respect to the bone markers can be visualized.

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RSA*core* Services

Model-based RSA software

Model-based RSA software allows you to perform both marker-based and model-based RSA studies. The 3D models necessary to perform model-based studies are specially made by RSA*core*.
Additional software modules are available to calculate Hip Wear and to analyze dynamic prosthesis behavior.
At RSA*core* we are continuously working to develop new features for the software and to improve the user-friendliness of the Model-based RSA software.

Study Support

It is also possible to have your RSA images analyzed by the specialists at RSA*core*.
At RSA*core* we have experienced staff to support all aspects of your RSA study including image collection and image analysis.
We support in *protocol writing*, *training site personel* and more. We perform all the *analyses* and provide detailed *reports.*

Consultancy

RSA*core* provides consultancy agreements to Model-based RSA software users. Whenever you run into trouble with your analyses, you can get support from the RSA*core* staff.
The agreement guarantees that you receive the latest software updates and bugfixes keeping your software in perfect condition to perform your study.

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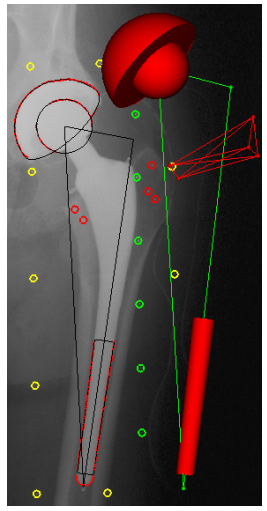
Additional software modules



Elementary Geometrical Shapes

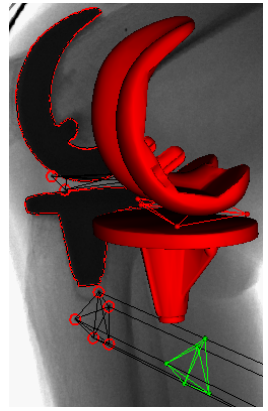
Some hip prostheses can be represented by elementary geometrical shapes (EGS). Therefore the creation of 3D prosthesis models is not necessary.
The EGS models together determine three ´markers´ which are used to calculate hip migration.

Hip Wear

The EGS module enables you to calculate the amount and the direction of hip liner wear. It is calculated by comparing the 3D positions of the center of the femoral head and the acetabular cup models.

Fluoroscopy

The fluoroscopy module enables you to easily analyze the 3D dynamic behavior of prostheses, by matching the virtual projected contours of the prosthesis with their corresponding detected contours in a fluoroscopic image sequence.



Information

References

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Contact

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