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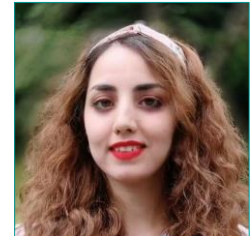
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Cemented short-stem total hip arthroplasty appears promising in patients with poor bone quality

Fahimeh Azari (1), Amelie Sas (1), Karl Philipp Kutzner (2), Andreas Klockow (3),
Thierry Scheerlinck (4), G. Harry van Lenthe (1)

1. KU Leuven, Belgium; 2. St. Josefs Hospital, Germany;
3. Mathys Medical, Switzerland; 4. University Hospital Brussels, Belgium

fahimeh.azari@kuleuven.be



KU LEUVEN

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European Orthopaedics



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Problem statement

Uncemented short stems are clinically successful:

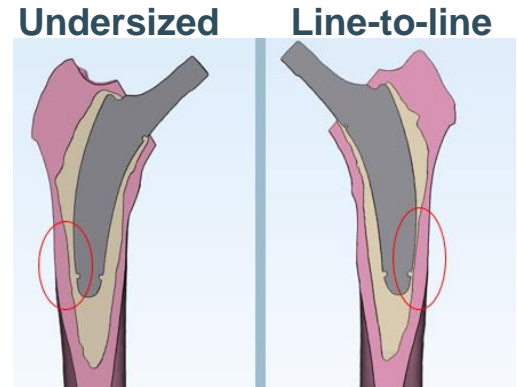
- Long term stability
- Preserve the proximal bone stock
- Simplify the implantation process



In patient with low bone quality, can cemented short stems be an alternative?

Aims:

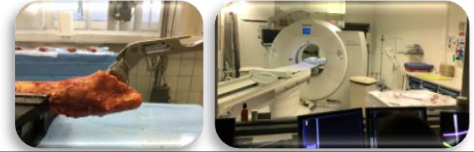
- Quantify the performance of cemented short stems
- Evaluate differences between two cementing strategies



Methods

Step1

Specimen preparation and medical imaging



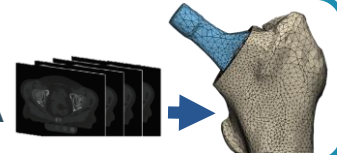
Step2

Implementing mechanical tests



Step3

Performing CT scan-based FEA



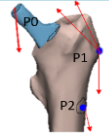
Step4

Validating FE results with experimental data



Step5

Simulating level walking under physiological Loading conditions



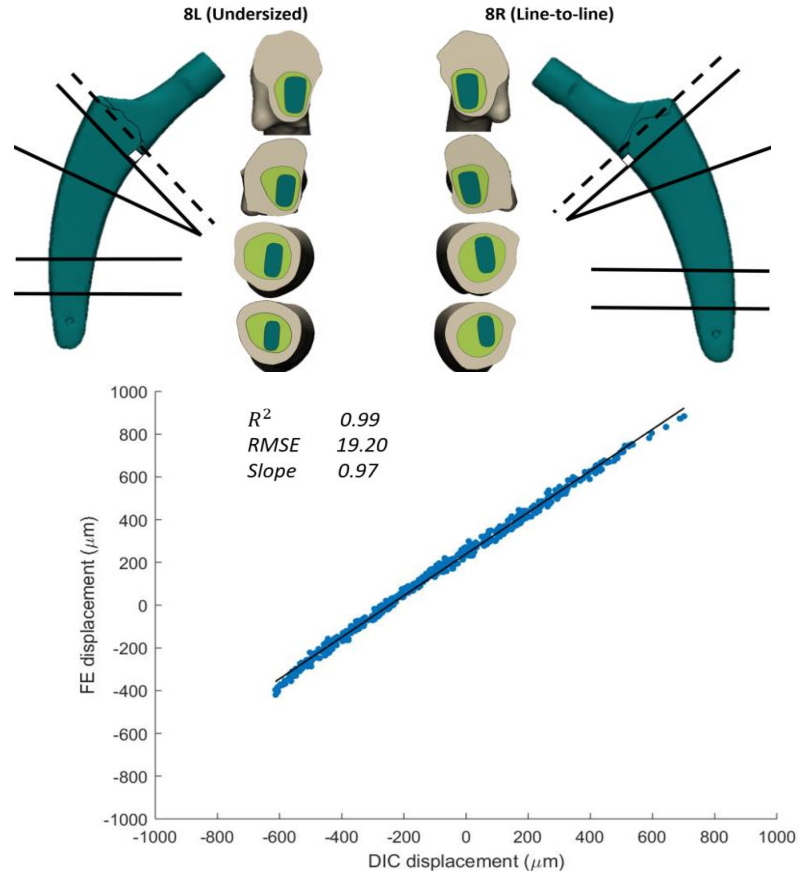
Results

Cement distribution:

Cement volume & thickness were similar in both cementing techniques

Validation study:

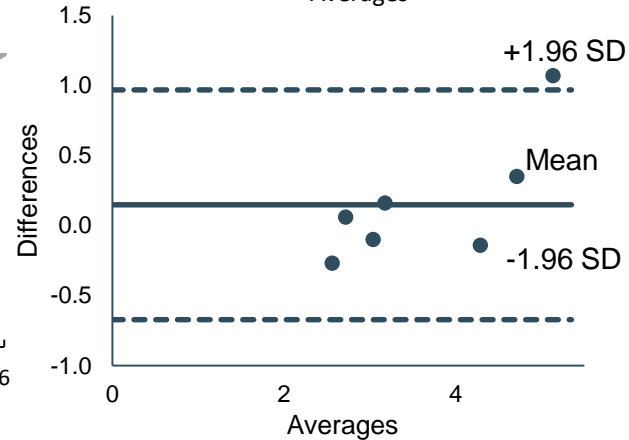
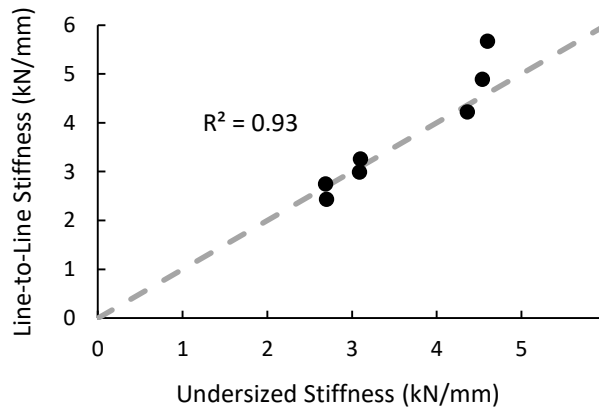
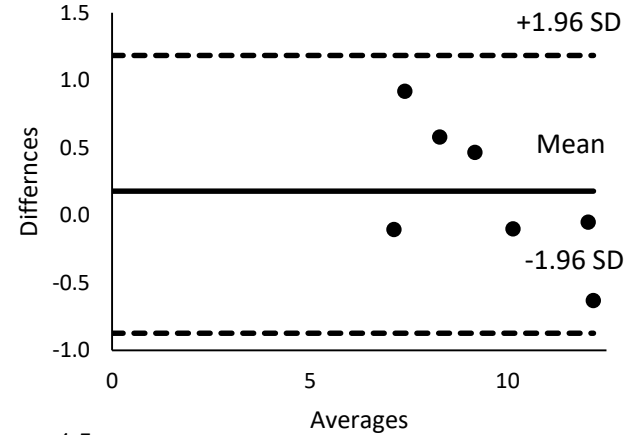
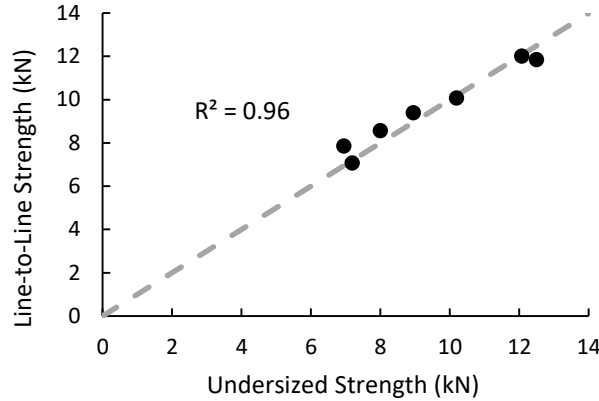
Data from the FE models agreed well with the experimentally measured data



Results

Line-to-line vs. Undersized

Strength and stiffness data showed very similar behavior for both techniques



Discussion

We concluded:

- Cemented version withstands physiological loading conditions
- Very similar behavior of the two cementing techniques

Open questions:

- Evaluating the long- term behaviour of the cemented short stems
- Comparison between the behaviour of cemented vs uncemented short stems