

Value of body-worn sensors to assess functioning in the follow-up of patients with a hip fracture

Submission date 11/02/2022	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 30/01/2023	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 27/05/2025	Condition category Surgery	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Osteoporotic hip fracture treatment remains challenging both due to the increasing age of the population and the high number of complications including death. As a consequence, multiple guidelines have been developed during the last decades to improve the care for geriatric hip fracture patients. Early surgery (surgery within 24 to 48 hours after admission), as well as early mobilization after surgery allowing for full weight bearing, have been proven to be important process indicators. To evaluate the postoperative functionality of geriatric hip fracture patients, both patient-reported, as well as observer-based measurement methods, are used. The aim of this study is to explore the added value of wearable technology for evaluating postoperative functionality through continuous measurement of posture and movement.

There are two primary study aims:

1. To describe patient-reported and observer-based evaluations of functional status during hospitalization for geriatric hip fracture treatment and at follow-up consultations at 6 weeks, 3 months and 6 months after surgery.
2. To evaluate the responsiveness of patient-reported, observer-based and sensor-provided functional assessment methods.

Who can participate?

Patients undergoing surgical repair for proximal femoral fracture, aged 50 years or over, allowed to execute any form of weight bearing

What does the study involve?

Detailed longitudinal follow-up of functioning using patient-reported, sensor-based and observer-based assessments of functioning up to 6 months after surgery.

What are the possible benefits and risks of participating?

Participating will help with the development of feasible, reliable and valid assessments of functioning. This will help with the detection of unfavourable functional outcomes in patients undergoing hip fracture repair. There are no risks associated with this study

Where is the study run from?

1. University Hospitals Leuven (Belgium)
2. KU Leuven (Belgium)

When is the study starting and how long is it expected to run for?

April 2021 to April 2024

Who is funding the study?

1. University Hospitals Leuven (Belgium)
2. KU Leuven (Belgium)

Who is the main contact?

Prof Dr An Sermon (Belgium)

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Additional identifiers

Study information

Scientific Title

Added value of a technology-driven assessment of functioning in patients with proximal femoral fracture

Acronym

IMU

Study objectives

1. To describe and compare patient-reported, observed, and technology-measured assessments of physical function (physical activity and functionality) during hospitalization and during follow-up consultations up to 6 months over time in patients with proximal femoral fracture.
2. To compare the responsiveness of patient-reported, observed, and technology-measured assessments of physical functioning (physical activity and functionality) in patients with proximal femoral fracture.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Approved 21/05/2021, Ethics Committee Research UZ/KU Leuven (Herestraat 49, 3000 Leuven, Belgium; +32 (0)16 34 86 00; ec@uzleuven.be), ref: S65163

Study design

Single-centre prospective interventional study with retrospective use of Good Clinical Practice data

Primary study design

Interventional

Study type(s)

Other

Health condition(s) or problem(s) studied

Surgical repair of proximal femur fractures in patients older than 50 years

Interventions

This study is a monocentric prospective study with an intervention (additional use of one sensor on the chest without health risk to the patient), with retrospective use of Good Clinical Practice

(GCP) data collected from 01-01-2021 to 22/04/2021 (physical activity measured by one similar sensor on the leg, the Timed-Up-and-Go test and observation of functioning during the hospitalization period).

After surgery, a sensor will be attached to the affected leg and the chest as soon as possible. This sensor measures physical activity throughout the hospitalization period. These sensors will be re-installed during a consultation at 6 weeks, 3 and 6 months after surgery to measure physical activity for at least 7 days at home. In addition, participants complete several questionnaires: Global Ratings of Perceived Effect, Parker Mobility Score, Pain Assessment, Fall Efficacy Scale and questionnaires on the ease of use of sensor measurements.

In addition, the researchers will perform the following measurements: Harris Hip Score, the Morton Mobility Index (DEMMI) and the timed up-and-go (TUG) test.

Finally, the researchers will also collect general information from the patients' medical records, as well as information about the surgery and rehabilitation.

Intervention Type

Mixed

Primary outcome(s)

1. Patient-reported functional status assessed using the Harris Hip Score: Pre-surgery status at day 9 after surgery; week 6, and months 3 and 6 after surgery
2. Observed functional status assessed using DEMMI at Day 9, week 6, and months 3 and 6 after surgery
3. Performance-based functional status assessed using TUG test at Day 9, week 6, and months 3 and 6 after surgery
4. Physical activity assessed using activity sensors during hospitalisation, at least 7 days at home, week 6, and months 3 and 6
5. Health status assessed using Global ratings of perceived effect at week 6, and months 3 and 6

Key secondary outcome(s)

The following outcomes will be extracted from the patients' medical records or questioned to the patient during hospitalisation and at day 9, week 6, months 3 and 6 after the surgery:

1. Pre-surgery status assessed at day 9 after surgery
2. Demographics and anthropometrics
3. Medical history
4. Time of admission, surgery
5. Surgical procedure, history of hip surgery
6. Time to start mobilization and gait rehabilitation, number and timing of physical therapy sessions
7. Date of admission, medical discharge and discharge (calculation of admission time, admission time until medical discharge)
8. Mental status assessed using a categorical clinician score (electronic patient record), at all time points
9. Comorbidity assessed using the American Society for Anaesthesiologists Physical Status classification
10. Comorbidity assessed using the Charlson Comorbidity Index
11. Medication schedule
12. Fear of falling assessed using the Fall Efficacy Scale
13. Mortality

14. Pain assessed using Numerical Rating Scale
15. Participation assessed using the Parker Mobility Score
16. Feasibility of sensor measurements assessed using Numerical Rating Scale

Completion date

26/04/2024

Eligibility

Key inclusion criteria

1. Surgical treatment of proximal femur fracture
2. Age >50 years
3. Immediate weight bearing allowed after surgery

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Other

Sex

All

Key exclusion criteria

1. Revision surgery (affected leg)
2. Pathological fracture
3. Preoperative bedridden, not able to stand up
4. Current COVID-19 infection or other infectious risk requiring isolation
5. Polytrauma/multiple injuries

Date of first enrolment

21/05/2021

Date of final enrolment

21/05/2025

Locations

Countries of recruitment

Belgium

Study participating centre

UZ Leuven

Herestraat 49

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Sponsor information

Organisation

Universitair Ziekenhuis Leuven

ROR

<https://ror.org/0424bsv16>

Funder(s)

Funder type

University/education

Funder Name

KU Leuven

Alternative Name(s)

Katholieke Universiteit Leuven

Funding Body Type

Private sector organisation

Funding Body Subtype

Universities (academic only)

Location

Belgium

Results and Publications

Individual participant data (IPD) sharing plan

Data are available on reasonable request from the corresponding study lead, Prof Dr An Sermon (an.sermon@uzleuven.be), but not publicly, given possible intellectual property affairs related to raw sensor data processing or classification algorithms in this specific population.

IPD sharing plan summary

Available on request