

# Study of bone cell changes in steroid-related femoral head necrosis using discarded tissue from routine hip replacement surgery

<b>Submission date</b> 24/02/2026	<b>Recruitment status</b> Recruiting	<input type="checkbox"/> Prospectively registered
<b>Registration date</b> 03/03/2026	<b>Overall study status</b> Ongoing	<input type="checkbox"/> Protocol
<b>Last Edited</b> 25/02/2026	<b>Condition category</b> Musculoskeletal Diseases	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data
		<input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

Not provided at time of registration

## Contact information

### Type(s)

Scientific, Principal investigator, Public

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## Additional identifiers

## Study information

### Scientific Title

Case-control study of osteoblastic mitochondrial quality control disorder in glucocorticoid-induced osteonecrosis of the femoral head

**Acronym**

MQC-GONFH-PP

**Study objectives****Ethics approval required**

Ethics approval required

**Ethics approval(s)**

approved 04/02/2026, Ethics Committee of Luoyang Orthopedic-Traumatological Hospital of Henan Province (Henan Provincial Orthopedic Hospital) (Henan Province, Luoyang City, 471200, China; +86 (0)15837982681; hnslyzgyllwyh@aliyun.com), ref: 2026KYKT0001-01

**Primary study design**

Observational

**Secondary study design**

Case-control study

**Study type(s)****Health condition(s) or problem(s) studied**

Glucocorticoid-induced osteonecrosis of femoral head

**Interventions**

This is a non-interventional case-control study with a 1:1 matching design. The case group consists of patients diagnosed with glucocorticoid-induced osteonecrosis of femoral head (GONFH) who require total hip arthroplasty, and the control group consists of patients with femoral neck fracture who require total hip arthroplasty and are matched with the case group by age ( $\pm 5$  years) and the same gender. No additional interventions are provided except routine clinical treatment for all participants. During the study, relevant samples are collected after total hip arthroplasty, and tests including Western Blot, qRT-PCR, transmission electron microscopy (TEM), immunohistochemistry (IHC), HE staining and Masson staining are performed to detect the expression levels of key molecules in the PINK1/Parkin signaling pathway, mitochondrial morphology and cristae structure, and the degree of osteoblast mitochondrial quality control disorder. Statistical analysis is used to explore the correlation between mitochondrial quality control disorder and GONFH Ficat stage.

**Intervention Type**

Other

**Primary outcome(s)**

1. Expression levels of key molecules in PINK1/Parkin signaling pathway (PINK1, Parkin and Drp1) measured using Western Blot and qRT-PCR at the end of sample collection, which is after total hip arthroplasty of the participants

**Key secondary outcome(s)****Completion date**

31/12/2026

# Eligibility

## Key inclusion criteria

1. Patients diagnosed with glucocorticoid-induced osteonecrosis of femoral head (GONFH) or femoral neck fracture, who need total hip arthroplasty
2. Aged 18-70 years old
3. Femoral neck fracture patients are matched 1:1 with GONFH patients by age ( $\pm 5$  years) and same gender
4. The interval between injury and total hip arthroplasty is less than 3 weeks for femoral neck fracture patients
5. GONFH patients meet Ficat stage II-IV
6. Voluntarily participate and sign the informed consent form

## Healthy volunteers allowed

No

## Age group

Mixed

## Lower age limit

18 years

## Upper age limit

70 years

## Sex

All

## Total final enrolment

0

## Key exclusion criteria

1. Complicated with other metabolic bone diseases, such as severe osteoporosis, hyperparathyroidism
2. Complicated with other diseases that may cause abnormal bone metabolism, such as severe diabetes, gout
3. Complicated with malignant tumors

## Date of first enrolment

01/03/2026

## Date of final enrolment

31/10/2026

# Locations

## Countries of recruitment

China

# Sponsor information

## Organisation

Luoyang Orthopedic-Traumatological Hospital of Henan Province

## ROR

<https://ror.org/05br7cm44>

# Funder(s)

## Funder type

## Funder Name

State Administration of Traditional Chinese Medicine of the People's Republic of China

## Alternative Name(s)

State Administration of Traditional Chinese Medicine, State Administration of TCM, SATCM

## Funding Body Type

Government organisation

## Funding Body Subtype

National government

## Location

China

# Results and Publications

## Individual participant data (IPD) sharing plan

## IPD sharing plan summary

Not expected to be made available