

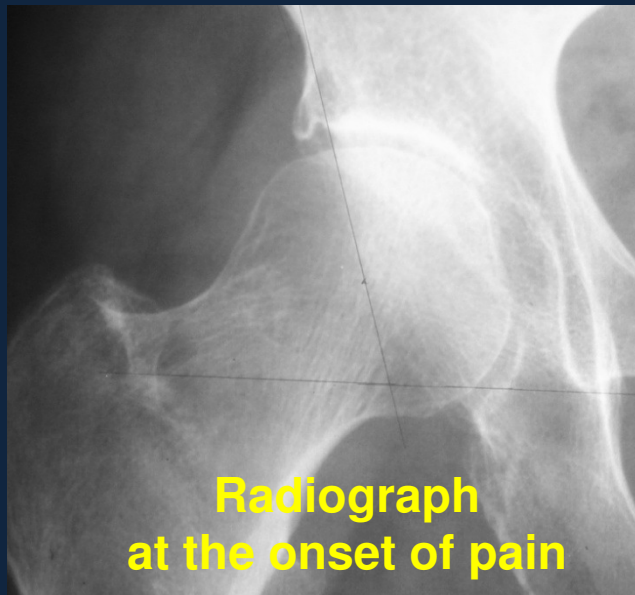
## <BACKGROUND>

There have been several case reports of subchondral insufficiency fracture of the femoral head (SIF) after the first report of Bangil.

Bangil M: Rev Rhum, 1996

Some cases of SIF have been managed by conservative treatment, while others demonstrated disease progression until bone collapse, which necessitated surgery.

There have **not been reported** about **the prognostic factors** in SIF.



## <OBJECTIVE>

To show the variable clinical and radiographic features and to determine the prognostic factors of progressive collapse in SIF

## <METHODS>

SIF diagnosed by MRI or histology

25 hips in 24 cases (4 males, 20 females)

MRI: T1 low signal band at the subchondral bone  
and bone marrow edema of the femoral head

Histology: a linear fracture paralleling the subchondral bone with fracture callus,  
reactive cartilage, and granulation tissue



Yamamoto T: Arthritis Rheum, 1999

Average age at the onset: 68.1 y.o. (range, 45 - 92 y.o.)

These cases were classified into three groups at the radiograph of final follow up.

Group	N	Treatment	Radiograph of final follow up
A	10	conservative treatment	no changes or slightly joint space narrowing
B	8	surgery	acute <b>progressive collapse</b> of the femoral head
C	7	surgery	progressive joint space narrowing <b>without collapse</b> of the femoral head

## Analysis

Clinical features

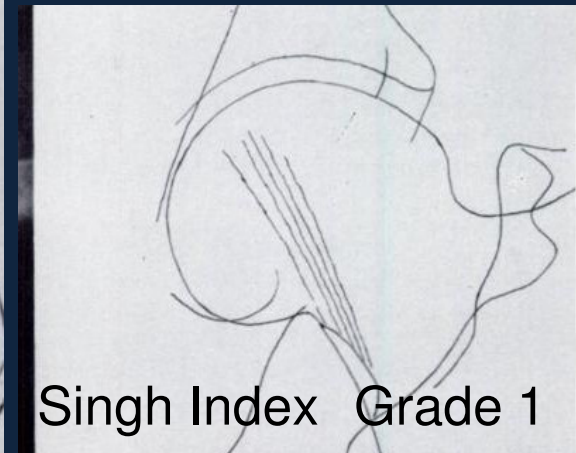
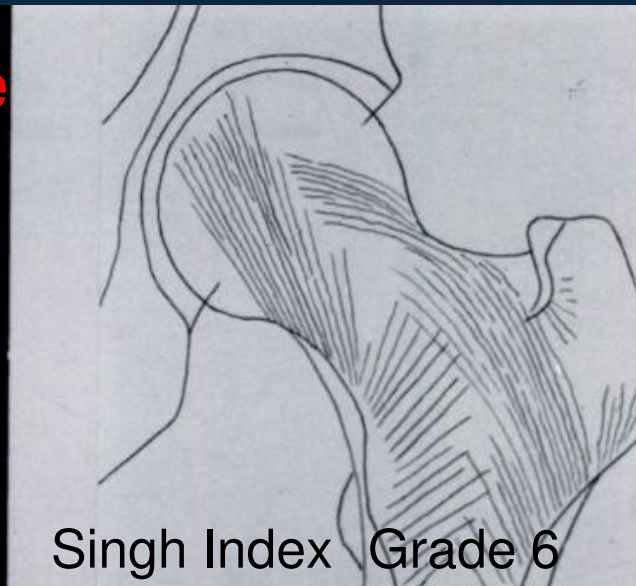
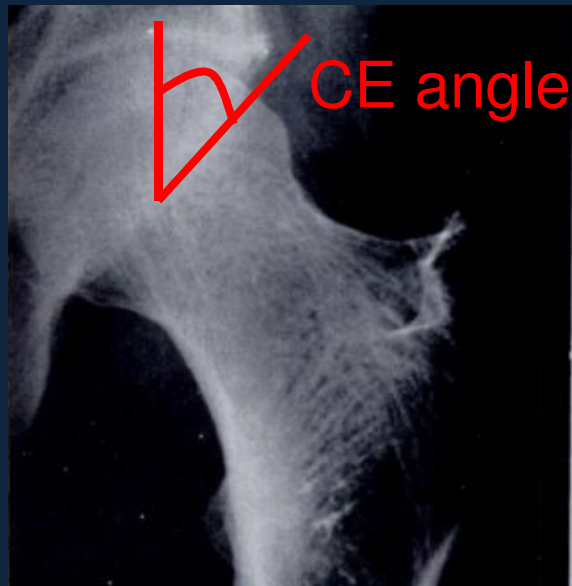
Period from onset to healing or surgery

Radiographs

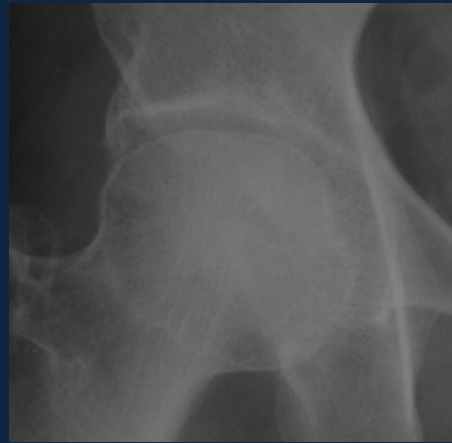
CE angle (Center-edge angle)

Singh Index

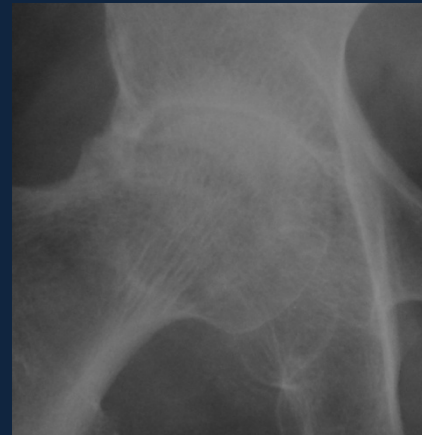
Grade 1, 2 were defined as severe osteoporosis.



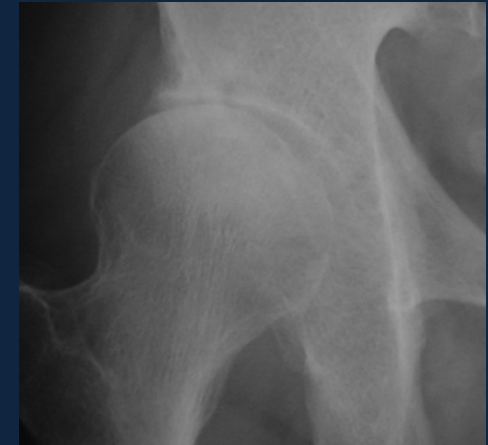
# <RESULTS>



Group A



Group B



Group C

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Average age  
(y.o.)

62.7  
(range, 51 - 77)

80.8  
(70 - 92)

72.4  
(66 - 86)

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Average period  
from onset to  
healing or surgery  
(months)

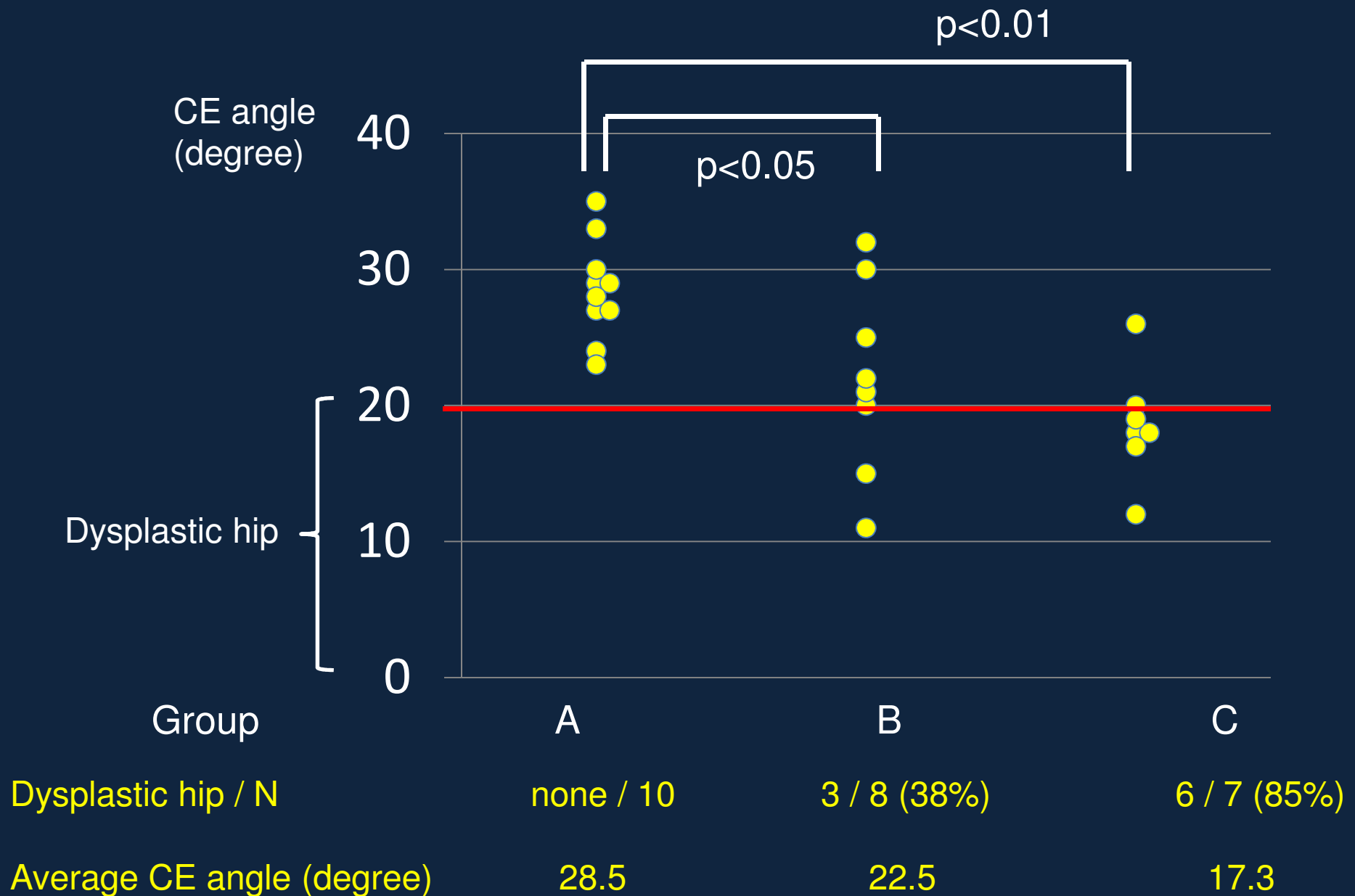
3.2  
(range, 2 - 6)

2.3  
(1 - 4)

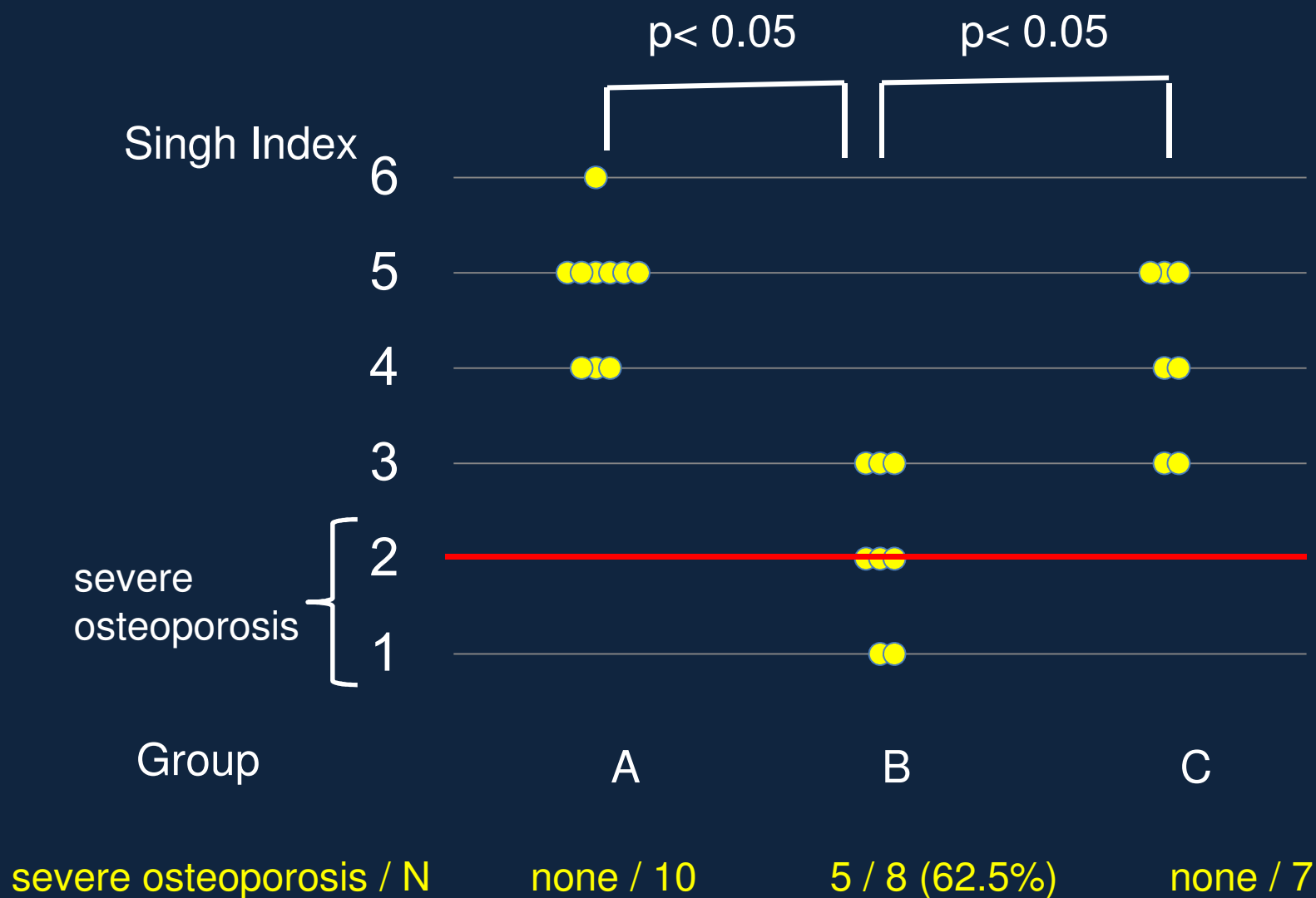
6  
(2 - 12)

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# CE angle in an initial radiograph of the hip among three groups

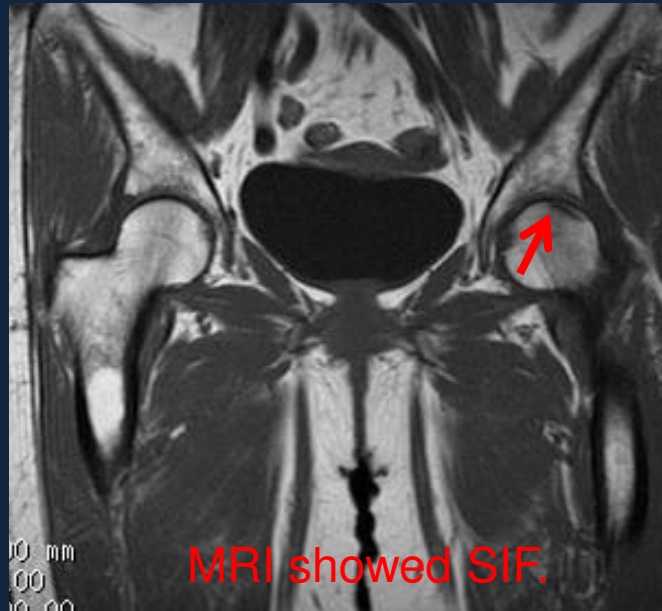
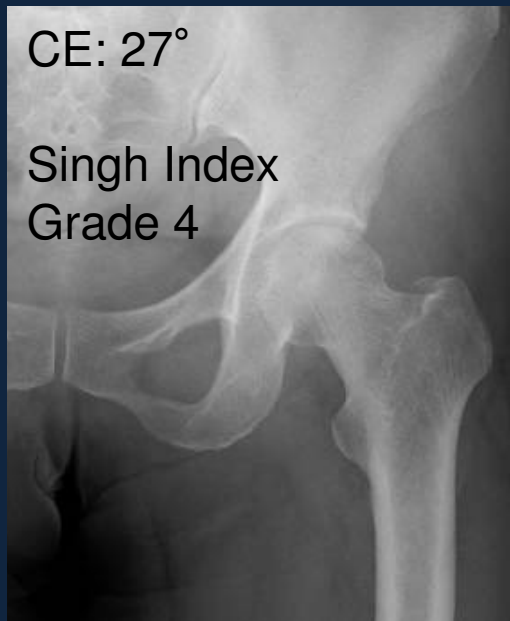


# Singh Index in the initial radiograph of the hip among three groups



## <DISCUSSION>

Current study revealed that **SIF** with **no dysplasia** or with **no severe osteoporotic bone** did not need surgery.



This case was cured by conservative treatment with no radiographic changes (Type A).

**Acetabular dysplasia** and **osteoporosis** were prognostic factors.

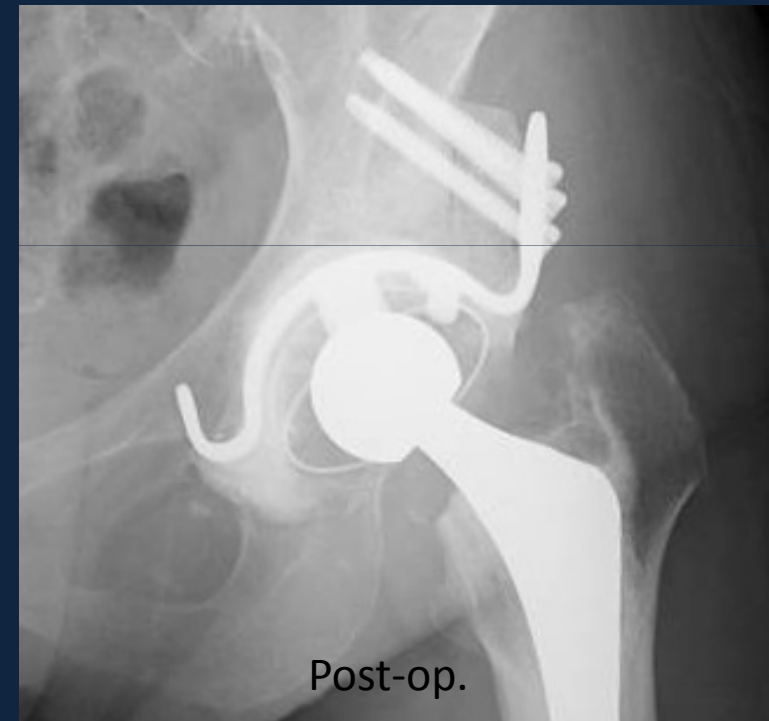
Future study: a multivariate analysis for other prognostic factors, such as patient activity, body mass index, extent of fracture, and initial treatment.

The hypothesis: SIF precedes rapidly destructive arthritis of the hip joint (RDA)

Yamamoto T: Arthritis Rheum, 2000

Watanabe W: Skeletal Radio, 2002

**RDA needs early surgery before severe acetabular and femoral bone loss.**



severe acetabular bone loss



required acetabular reconstruction  
with bone graft



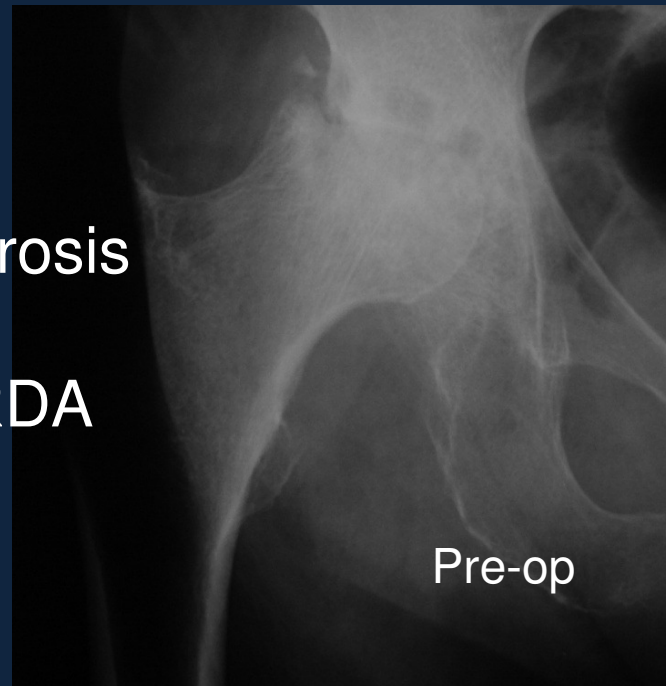
SIF with severe osteoporosis (Singh index 1 -2) is easy to develop acute progressive collapse of the femoral head (type B).

Type B SIF often needed early surgery  
(average period from onset to surgery: 2.3 months).



Early surgery should be performed for SIF with severe similar to RDA.

SIF w/ Osteoporosis  
=  
Precursor of RDA  
?



before severe acetabular bone loss



Bone graft was not needed.

## <CONCLUSIONS>

- The clinical and radiological features of SIF in 25 hips were revealed.
- Acetabular dysplasia (CE angle) and osteoporosis (Singh index ) were prognostic factors.
- Type B SIF (performed surgery for acute progressive collapse of the femoral head) required early surgery (2. 3 moths after onset ).
- Early surgery should be performed in SIF with severe osteoporosis (Singh Index Grade1 - 2).
- SIF with severe osteoporosis may be a precursor of RDA.