Intraarticular Pathology Affects Outcomes In ONFH Patients

There in no conflict of interest.

1) Department of Orthopaedic Surgery, Graduate School of Biomedical Sciences, Hiroshima University
2) Department of Orthopaedic Surgery, Kure Medical Center and Chugoku Cancer Center
3) Department of Orthopaedic Surgery, Hiroshima Prefectural Rehabilitation Center

Takeshi Shoji[1)]
Takuma Yamasaki[2)] Hideki Saka[1)] Tadashi Inoue[1)] Yuichi Kato[1)]
Yusuke Fujiwara[1)] Yuji Yasunaga[3)] Nobuo Adachi[1)]

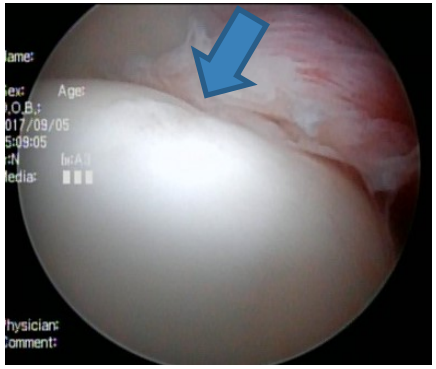
Introduction & purposes

Osteonecrosis of the femoral head (ONFH)

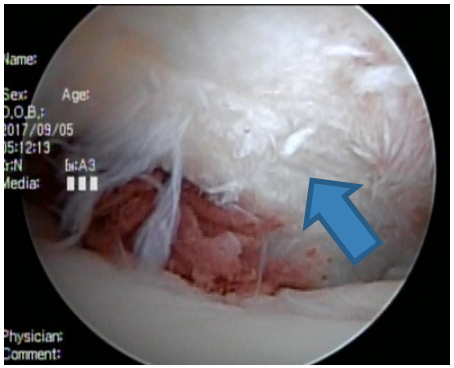
Intra-articular pathology

Arthroscopic findings

Collapse of femoral head



cartilage and labrum degeneration



Detailed knowledge and its relationship to outcomes after joint-preserving surgery is lacking.

Purposes

PURPOSE

Evaluation of the intra-articular pathology and its relationship with outcomes of joint preserving surgery in ONFH.

Patients & methods

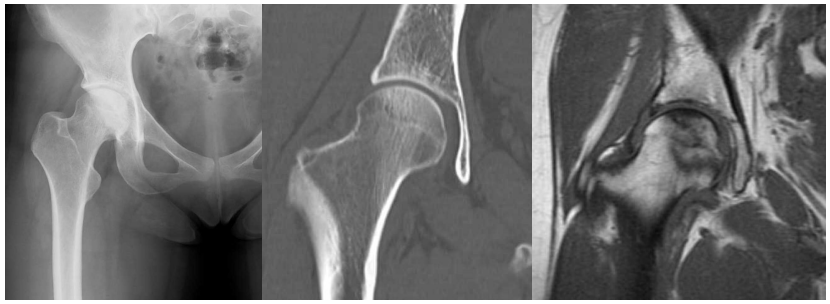
ONFH patients (pts)

41 hips 41 pts after intertrochanteric curved varus osteotomy

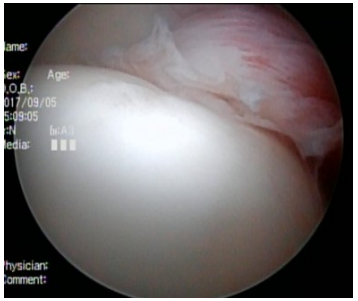
Gender	Male	(n)	14
	Female		27
Mean age		(y.o.)	34.9 ± 11
Association of osteonecrosis		(n)	
	Steroid		29
	Alcoholism		6
	Idiopathic		6
Type	C-1	(hips, %)	35
	C-2		6
Stage	2	(hips, %)	17
	3A		23
	3B		1

Radiographic & arthroscopic evaluation

Height of collapse and the minimal joint space width



Labral and cartilage evaluation



Results

Demographic date

Follow up duration after VO	(m)	58.8 ± 21.6
Radiographic findings (plain radiograph)		
Collapse of FH at pre-op	(n)	20
Height of collapse	(mm)	0.77 ± 0.78
Progression of Collapse at 3 years post-op	(n)	8
Height of collapse	(mm)	1.1 ± 1.0
Progression of collapse at last follow up	(n)	8
Height of collapse	(mm)	1.2 ± 1.1
Joint space width at pre-op	(mm)	3.8 ± 0.7
Development of OA at 3 years post-op	(n)	12
Joint space width	(mm)	3.2 ± 1.1
Development of OA at last follow up	(n)	16
Joint space width	(mm)	2.9 ± 1.3

Radiographic and arthroscopic findings

	n (%)	X-p	CT	MRI	Arthroscopy
Femoral head					
Collapse		20 (49%)	24 (59%)	6 (15%)	10 (24%)
Cystic lesion			26 (63%)	24 (59%)	
Irregularity of articular surface				13 (32%)	24 (59%)
Acetabulum					
Articular lesion				13 (32%)	22 (54%)
Labral tear				10 (24%)	13 (32%)

		Association of osteonecrosis			Type		Stage	
	total	Steroid (29)	Alcoholism (6)	Idiopathic (6)	C-1 (34)	C-2 (7)	2 (17)	3A,3B (24)
Femoral head								
Collapse (CT)	24	18 (62%)	3 (50%)	3 (50%)	20 (57%)	4 (67%)	0	24 (100%)
Cystic lesion (CT)	26	19 (66%)	4 (66%)	3 (50%)	22 (63%)	4 (67%)	7 (41%)	19 (79%)
Irregularity of articular surface (arthroscopy)	24	16 (55%)	5 (83%)	3 (50%)	18 (53%)	6 (86%)	6 (35%)	18 (75%)
Acetabulum								
Articular lesion (arthroscopy)	22	15 (52%)	3 (50%)	4 (66%)	17 (50%)	5 (71%)	7 (41%)	15 (63%)
Labral tear (arthroscopy)	13	10 (34%)	1 (17%)	2 (33%)	10 (29%)	3 (43%)	5 (29%)	8 (33%)

Results are expressed as number and percentage

Depth of collapse in femoral head

		Type of ONFH			Stage of ONFH		Cystic lesion in FH		Folds formation at FH	
		C-1	C-2		Stage2	Stage3A, 3B	None	Present	None	Present
3 years post-op	(mm)	0.27±0.5	1.27±1.3	*	0.55±1.1	0.37±0.5	0.64±1.1	0.32±0.5	0.29±0.8	0.55±0.7
Last follow up	(mm)	0.36±0.7	1.3±1.3	*	0.62±1.2	0.44±0.6	0.77±1.2	0.37±0.6	0.29±0.8	0.68±0.9

Results are expressed as mean ± SD or number. * ; $p<0.05$

Change of joint space width

		Type of ONFH			Stage of ONFH		Cartilage degeneration			Labral injury		
		C-1	C-2		Stage2	Stage3A, 3B	None	Present		None	Present	
3 years post-op	(mm)	-0.45±0.7	-1.33±1.3	*	-0.84±1.1	-0.41±0.7	-0.28±0.6	-1.18±1.2	*	-0.33±0.6	-1.26±1.1	*
Last follow up	(mm)	-0.63±0.8	-1.59±1.5	*	-0.85±1.1	-0.75±1.0	-0.45±0.8	-1.18±1.2	*	-0.5±0.7	-1.56±1.4	*

Results are expressed as mean ± SD or number. * ; $p<0.05$

Multivariate analysis of the factors influencing progressive OA

At 3 years post-op

	Odds ratio	95%CI	P-values
Degenerative changs of articular cartilage	6.4	1.34-30.1	<0.05
Labral tear	5.35	1.12-25.5	<0.05
Duration to the operation from ONFH development	1.0	0.99-1.07	0.19

CI: confidence interval

At last follow up

	Odds ratio	95%CI	P-values
Degenerative changs of articular cartilage	13.6	2.72-68.1	<0.05
Labral tear	5.14	1.17-22.7	<0.05

CI: confidence interval

Discussions

Intra-articular pathology in ONFH patients

There is no correspondence between histopathology and radiological stage.

(Mukisi-Mukaza M,et al.Histopathology of aseptic necrosis of the femoral head in sickle cell disease. Int Orthop. 2011)

This study

	n (%)	X-p	CT	MRI	Arthroscopy
Femoral head					
Collapse		20 (49%)	24 (59%)	6 (15%)	10 (24%)
Cystic lesion			26 (63%)	24 (59%)	
Irregularity of articular surface				13 (32%)	24 (59%)
Acetabulum					
Articular lesion				13 (32%)	22 (54%)
Labral tear				10 (24%)	13 (32%)

CT and MRI have not really shown the full extent of the tissue damage.

Hip arthroscopy before or during surgery may have a role if joint-preserving surgery is planned.

Discussions

Relationship with outcomes of joint preserving surgery in ONFH

Early detection of cartilage degeneration is important
to predict the natural history and decide the appropriate timing for surgery.

(Smith TO, et al. Eur J Orthop Surg Traumatol 2013)

This study

	Odds ratio	95%CI	P-values
Degenerative changs of articular cartilage	13.6	2.72-68.1	<0.05
Labral tear	5.14	1.17-22.7	<0.05

These intra-articular pathologies are associated with OA progression.

These intra-articular pathologies may possibly influence
the natural course of ONFH.

Conclusion

Our data demonstrate

the presence of labral and acetabular cartilage lesions in ONFH patients,

while images do not reveal the full extent of the tissue damage.

These intra-articular pathologies can be associated with the outcomes

after joint-preserving surgery.