

Arthroscopic Treatment of Acetabular Labral Tears



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TAIWAN

Acetabular Labrum

- Fibro-cartilaginous rim
- Effectively deepen the acetabulum and may assist in constraint of the femoral head within the bony socket.
- Free nerve endings and sensory organs
 - ➔ nociceptive and proprioceptive mechanism
- Vessels penetrate to a depth of 0.5 mm, leaving most of the labrum avascular

Kim & Azusa Clin Orthop 1995

Kelly et al Arthroscopy 2005

Injury Mechanism

- Acetabular labral tear may occur in the absence of specific recognizable trauma.
- 1/3 unknown causes, 2/3: sports injury, trauma, fall
Farjo LA et al Arthroscopy 1996
Hase & Ueo Arthroscopy 1996
- Femoroacetabular impingement (FAI)
- Acetabular dysplasia: Female athlete
- Joint degeneration

Physical Examination

- Pain elicited by **internal rotation** with joint **Max. flexion** (most sensitive)



Physical Examination

- Pain elicited by external rotation with joint Max. flexion



Physical Examination

- Pain elicited by axial compression to the joint flexed 90° and slightly adducted



Differential Diagnosis

- HIVD
- Avascular necrosis
- Iliopsoas bursitis
- Snapping hip syndrome
- Villonodular synovitis
- Synovial chondromatosis
- Stress fracture

MR Arthrography

- MRAr 91% accuracy
- MRI 36% accuracy

Czerny et al. Radiology 1996

Petersilgc et al. Radiology 1996



MRAr (MR Arthrography)

Normal anatomy



2004



23rd Annual Meeting

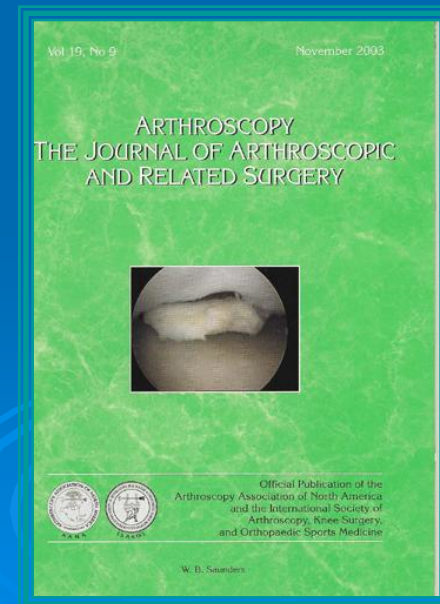


Arthroscopy Association of North America

Evaluating Hip Labral Tears Using Magnetic Resonance Arthrography: A Prospective Study Comparing Hip Arthroscopy and Magnetic Resonance Arthrography Diagnosis

Yi-Sheng Chan, M.D., Li-Chang Lien, M.D., Huei-Ling Hsu, M.D., Yung-Liang Wan, M.D.,
Mel S. S. Lee, M.D., Ph.D., Kuo-Yao Hsu, M.D., and Chun-Hsiung Shih, M.D.

Arthroscopy 21: 1250-1256, 2005





Tubular Acetabular Intraosseous Contrast Tracking in MR Arthrography of the Hip: Prevalence, Clinical Significance, and Mechanisms of Development

Li-Chang Lien¹
John C. Hunter²
Yi-Sheng Chan³

OBJECTIVE. The purpose of this study was to describe tubular intraosseous tracking of contrast medium in the acetabular fossa, to our knowledge a previously undocumented imaging finding in MR arthrography of the hip, and to discuss its prevalence, clinical significance, and possible mechanisms of development.

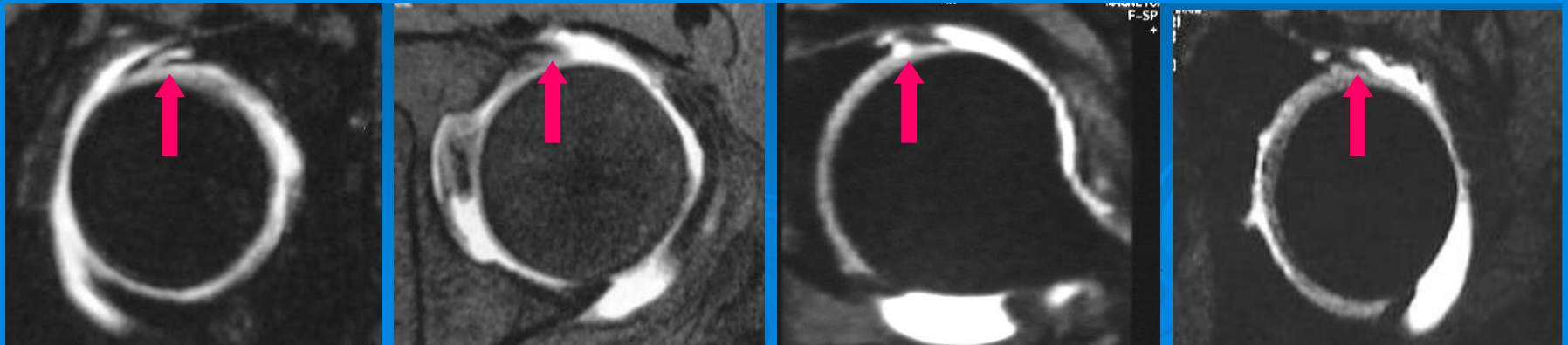
CONCLUSION. Tubular acetabular intraosseous contrast tracking is a common MR arthrographic finding that seems to have little clinical significance. Although the exact pathophysiologic mechanism is unknown, we presume repeated pumping of joint fluid through the nutrient foramina of the acetabular fossa may be one mechanism.

American Journal of Roentgenology 187: 807~810, 2006.

MRAr interpretation

➤ Labrum tears

- Contrast retention inside the labral substance
- Contrast retention in labral-acetabular junction
- Obvious contour defect



MRAr v.s. Hip Scopic Findings

- The sensitivity and accuracy of MRAr for the diagnosis of hip labral tear were 100% (16/16) and 94% (16/17), respectively.
- The sensitivity and accuracy of radial reformatted MRAr for mapping of tear location were 100% (20/20) and 95% (20/21), respectively.



Surgical Indications for Hip Labral Tears

- Patients received failed conservative treatment (over 6 months), including nonsteroidal anti-inflammatory medications, physical therapy, and partial weight bearing with crutches.
- “Patients with positive MRA findings with symptomatic hip were recommended to undergo hip arthroscopic surgery.” – **My protocol**

Hip Arthroscopy Indications

- **Labral Tears**
- **Loose Bodies**
- **Degenerative Diseases**
- **Chondral Injuries**
- **Avascular Necrosis**
- **Synovial Disease**
- **Ruptured Ligamentum Teres**
- **Impinging Osteophytes**
- **Instability**
- **Joint Sepsis**
- **S/P Total Hip Arthroplasty**
- **Unsolved Hip Pain**
- **Associated with Open Procedures**

Surgical Approach



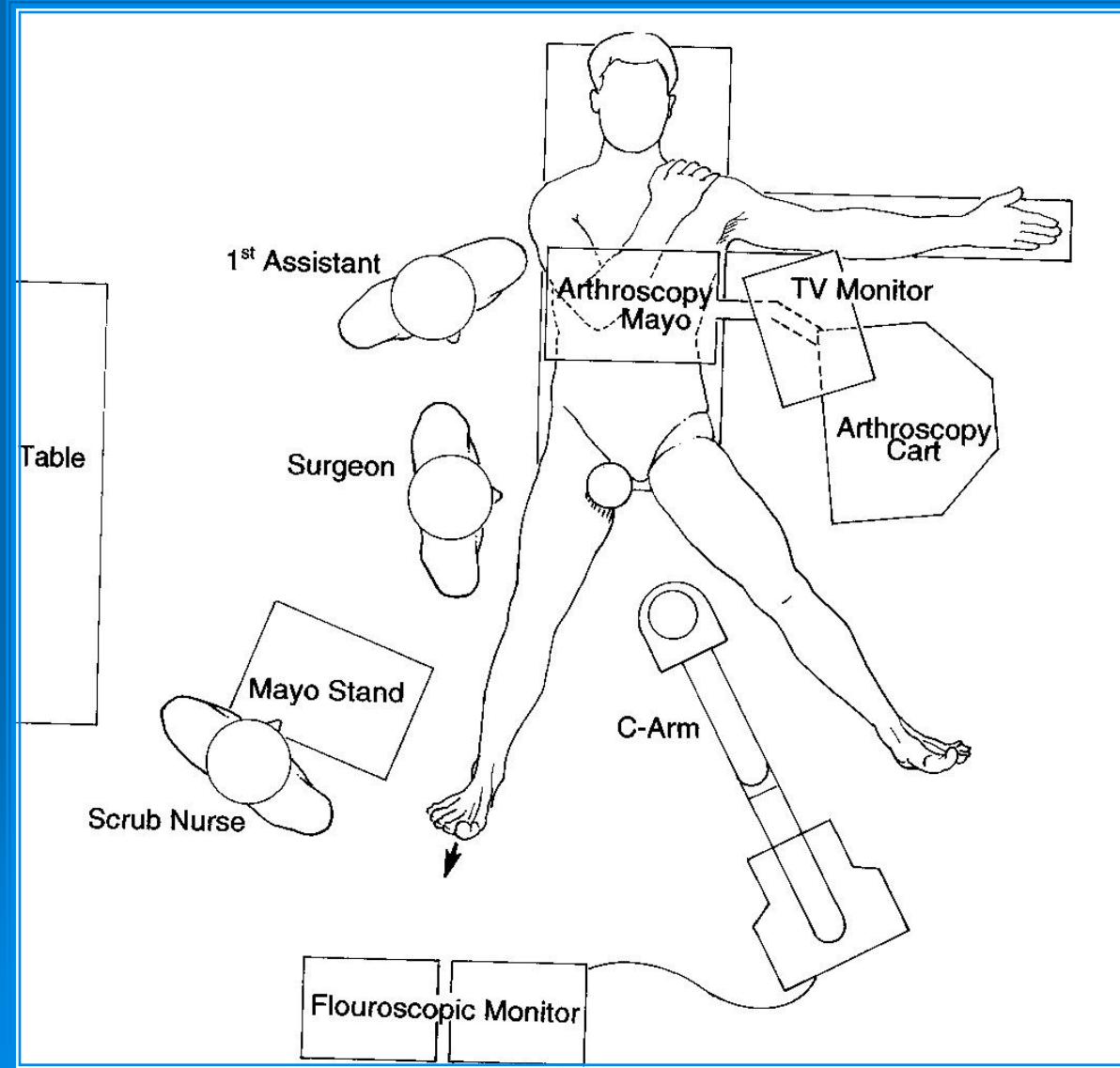
Hip Arthroscopy

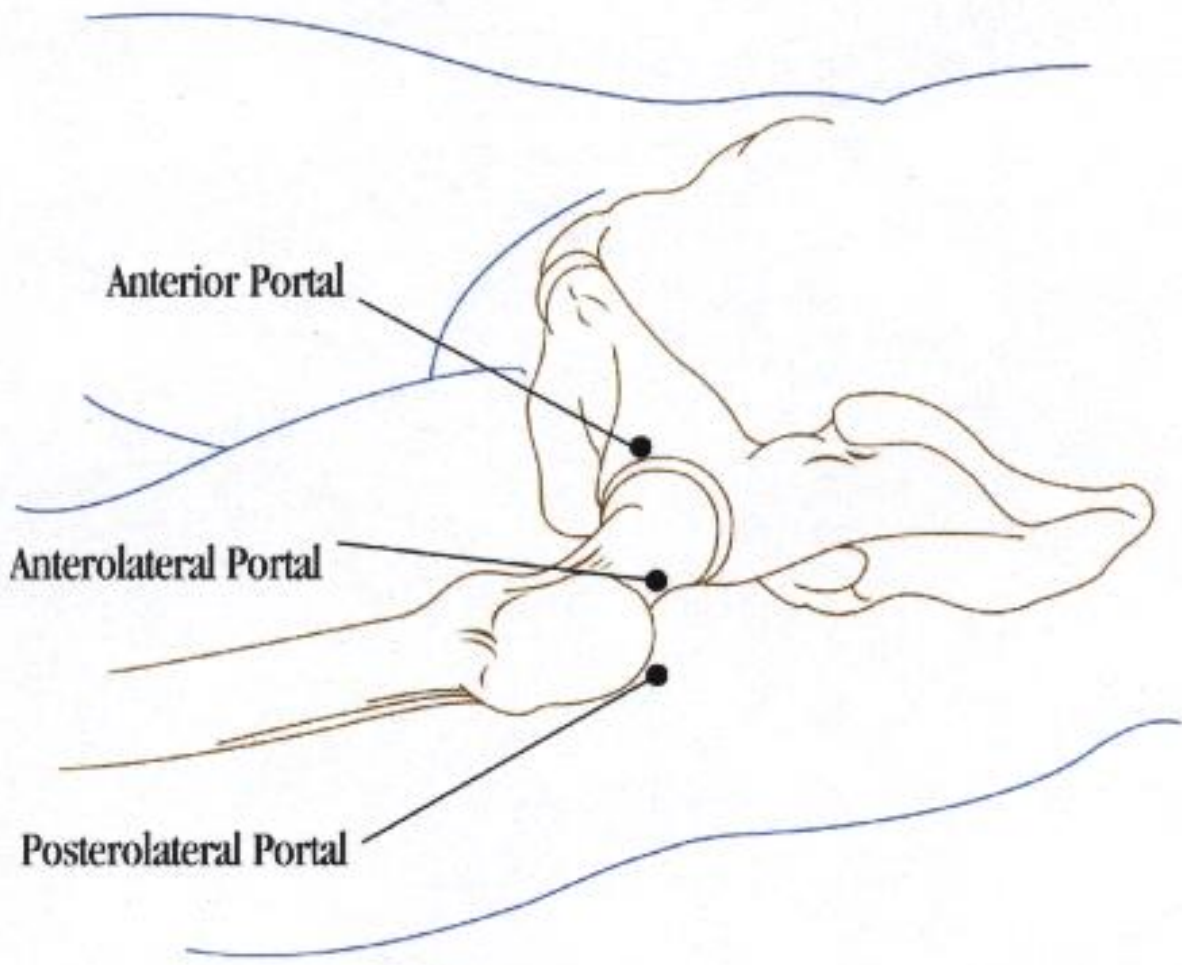
The Supine Approach

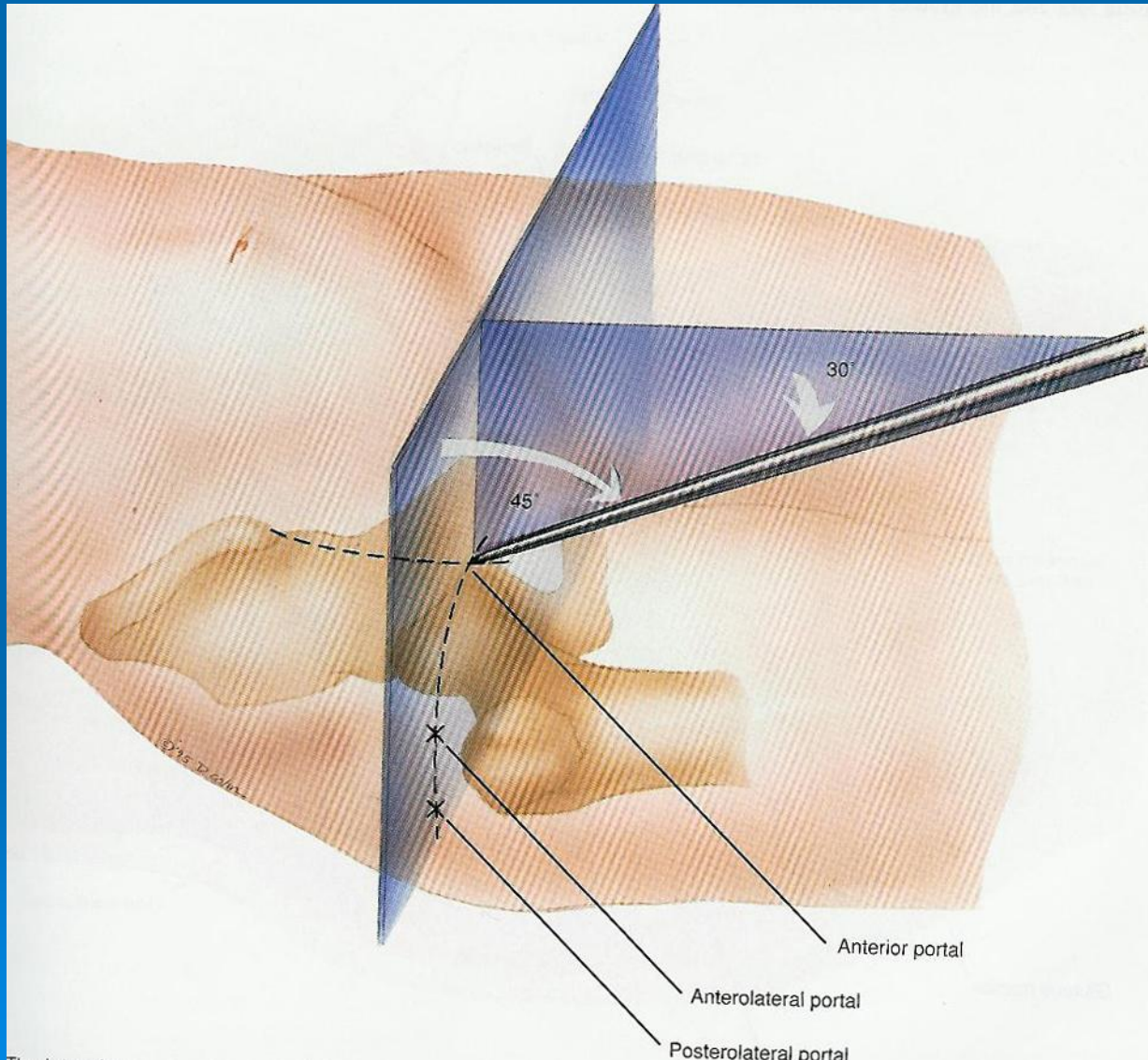
- Effective and reproducible
- Standard fracture table
- Positioning simple and time efficient
- Orientation familiar for surgeons
- OR layout user friendly for the surgeon and staff

The Lateral Approach

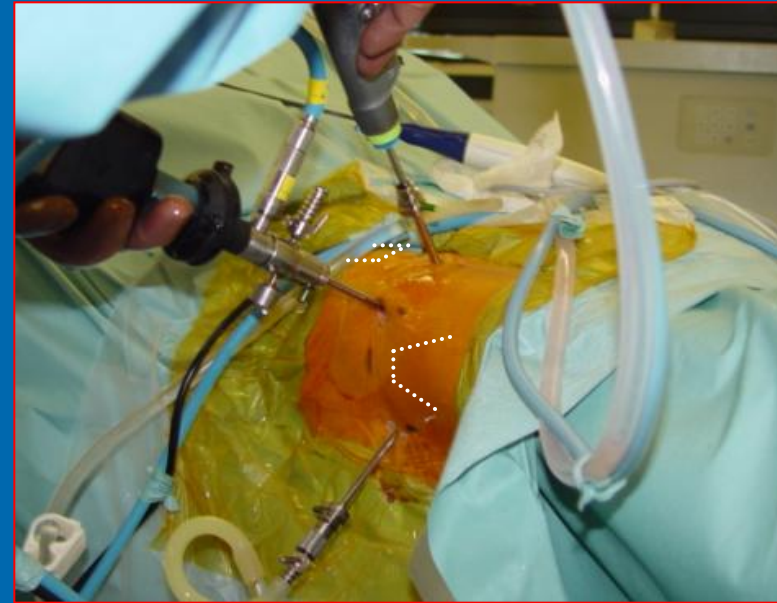
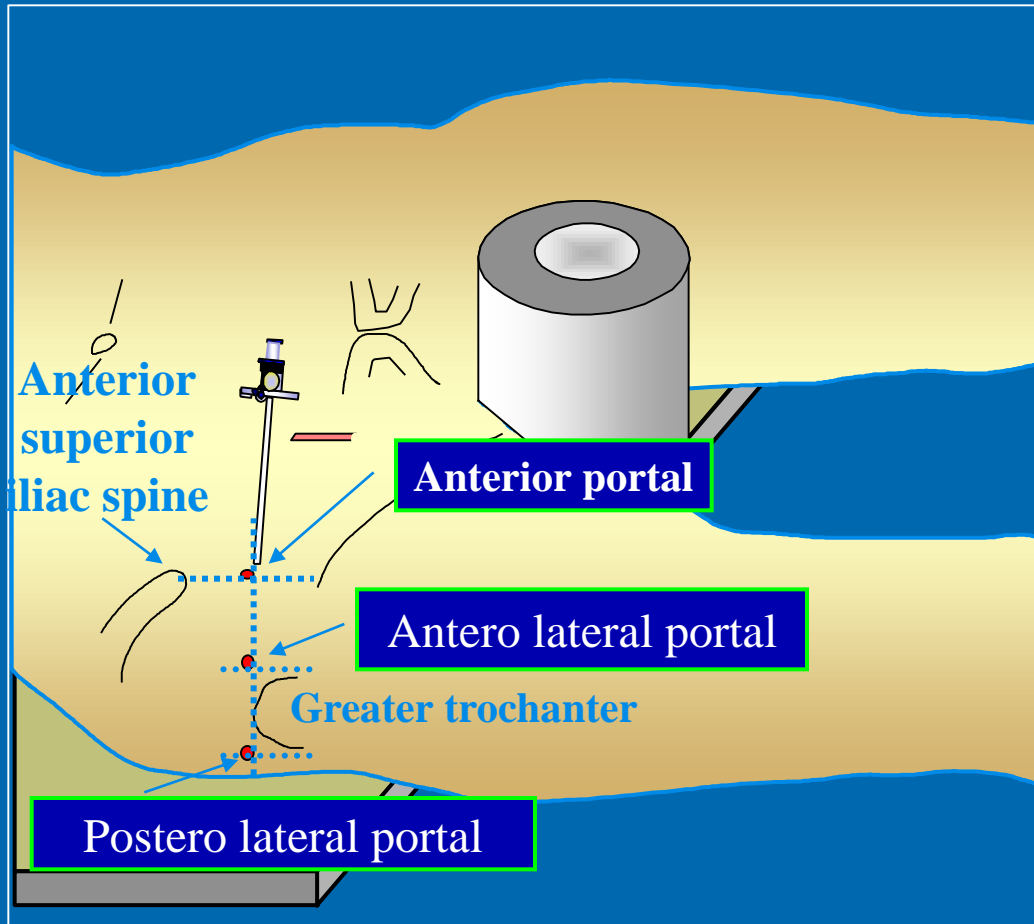
Supine Approach







Portal Placement



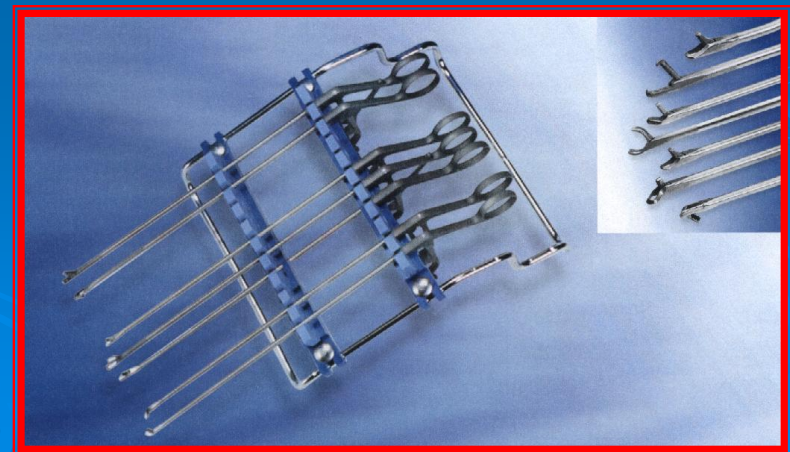
Hip Arthroscopy

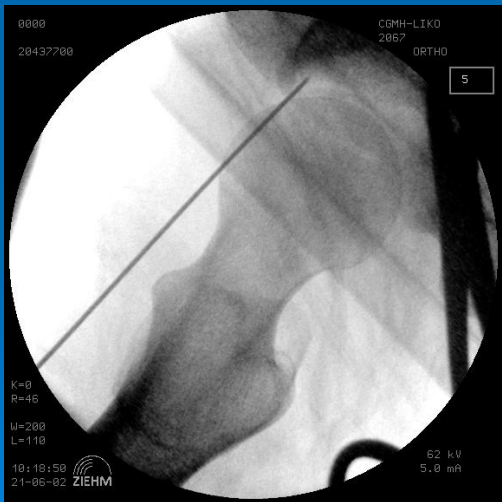
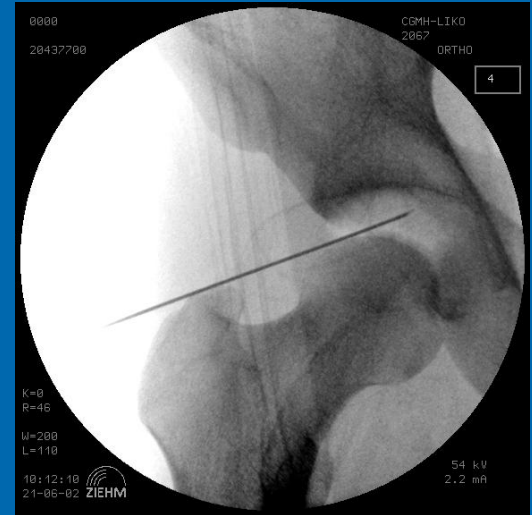
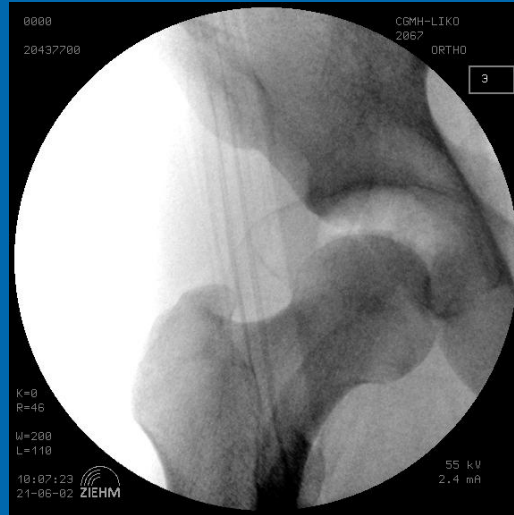
General Set-Up

- G/T anesthesia
- **Supine position**
- **Fracture table**
 - traction force 25 to 50 pounds
 - Hip extension & 25⁰ abduction
- **Image Intensifier**

Hip Arthroscope

- 30° and 70° arthroscopes
- Cannulated obturator system
- Extra length shaver
- ElectroThermal Probes





Fracture Table



Universal Hip Distractor



Clinical Application

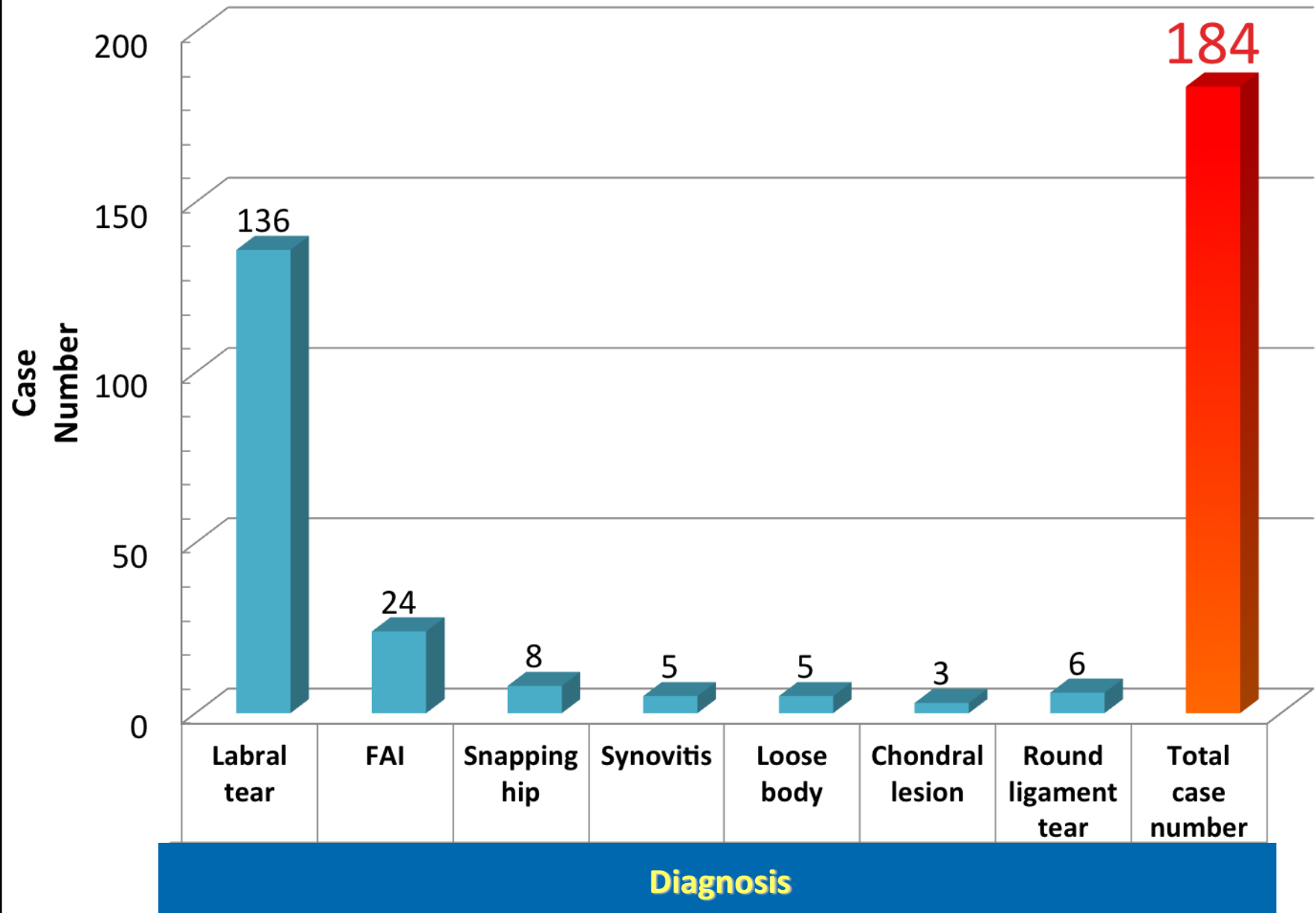
~ My Experience ~



Surgical Indications for 130 Hips 2002 ~ 2005

Diagnosis	No. of patients (%)
Labral tear	95 (73)
Painful dysplastic hip	12 (9)
Less advanced osteoarthritis with mechanical symptoms	6 (4.5)
Painful synovitis	6 (4.5)
Ligament teres tear	3 (2.3)
Chondromatosis	3 (2.3)
Femoroacetabular impingement	5 (3.8)

2006~2011 Hip Arthroscopy



Hip Arthroscopy for Labral Tears: A Minimal 5-Year Follow-up Results

Yi-Sheng Chan¹, Yang-Pin Lo¹, Li-Chang Lien²,
Kuo-Yao Hsu¹, Mel S-S Lee¹, Chun-Hsiung Shih³

¹Department of Orthopaedic Surgery, Division of Sports Medicine,

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Hospital, Taipei, Taiwan, R.O.C.



Purpose

- **In this study, we present our experience in arthroscopic treatment of acetabular labral tears and report the minimal 5-year follow-up results.**

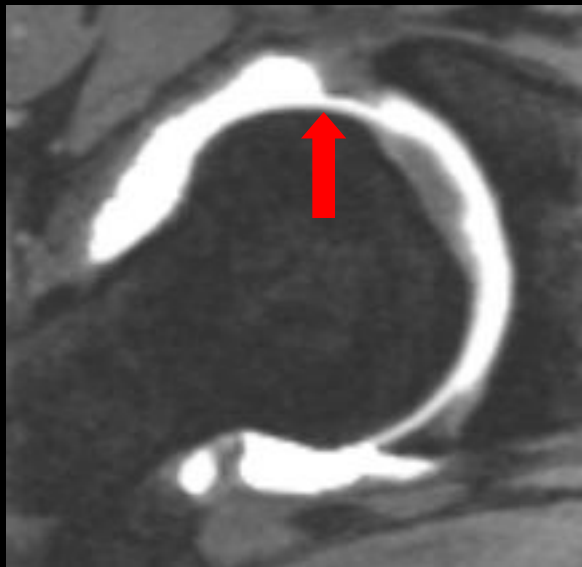
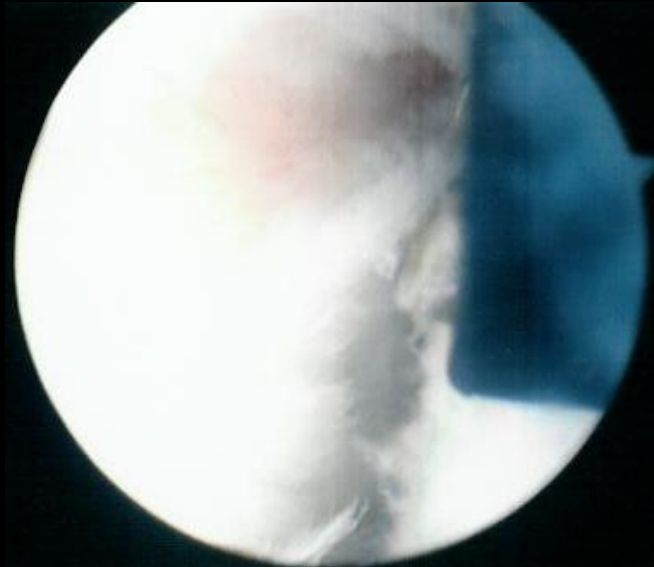
- **62 hips in 61 patients (Jun 2002 ~ Aug 2007)**
- **Male 20 / Female 42 (one of the female with both hips)**
- **Right : Left = 32 : 30**
- **Average Age : 43 Y/O (20~66 yrs)**
- **Average F/U time : 60 months (36~84 ms)**
- **Average duration of symptoms before surgery: 14 months (6~ 60 ms)**

- **All patients had standard plain radiographs and magnetic resonance arthrography (MRAr) and all have well scope correlation with labral tears**
- **Assess with modified Harris hip score pre-op and post-op or until a subsequent procedure performed**

Axial View



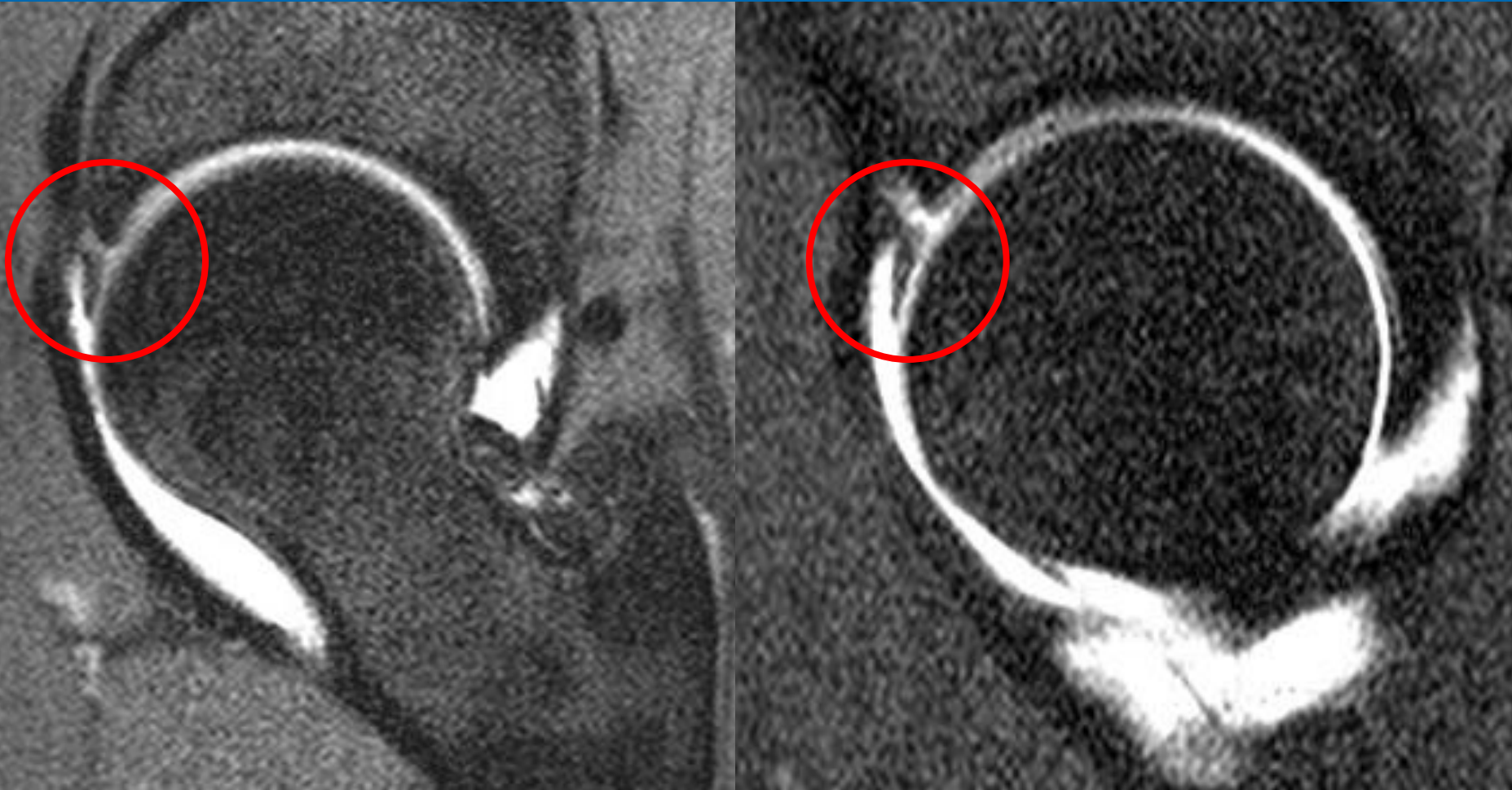
RT Ant-Sup Labral Tear



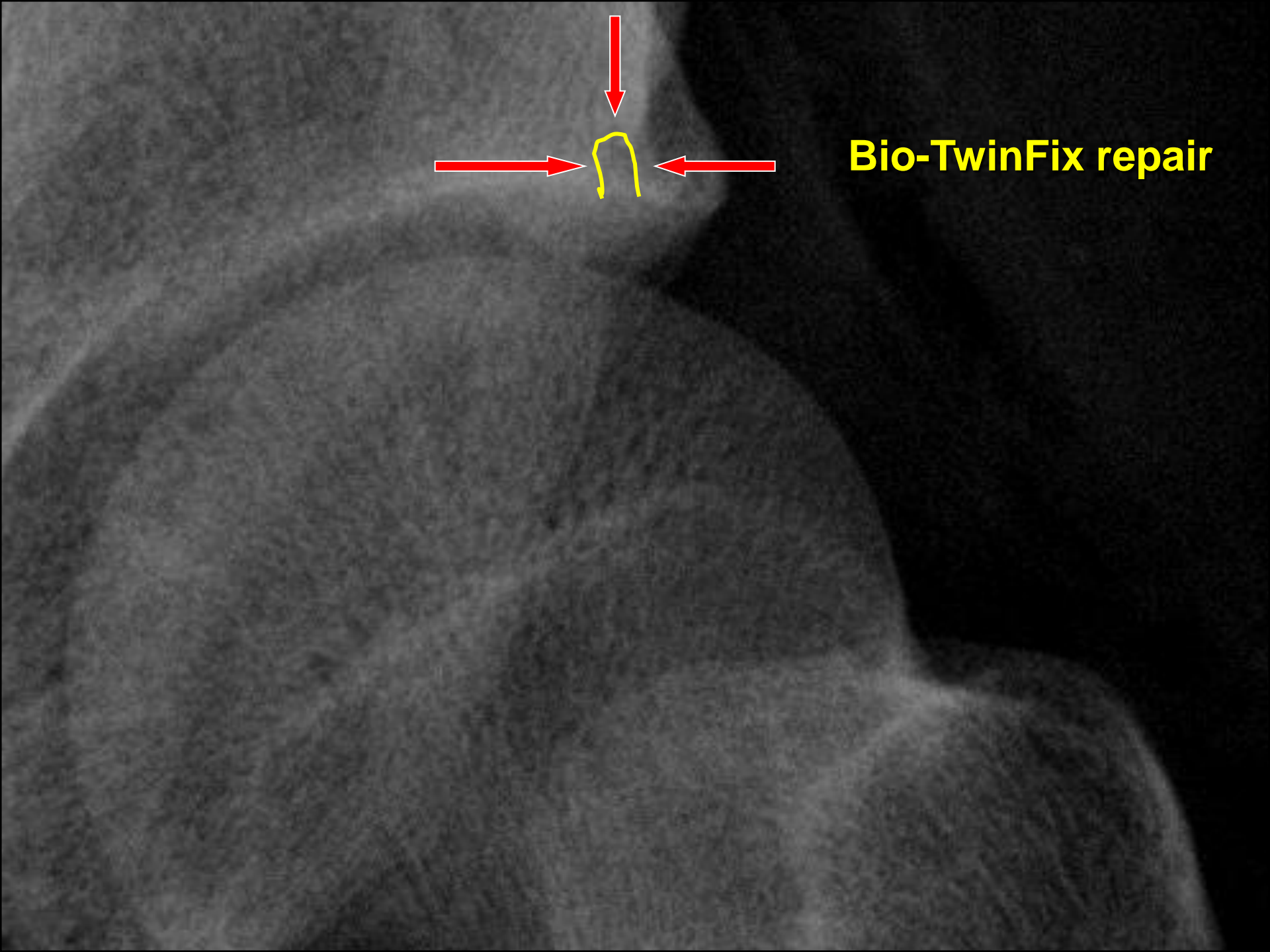
Oblique-Axial View



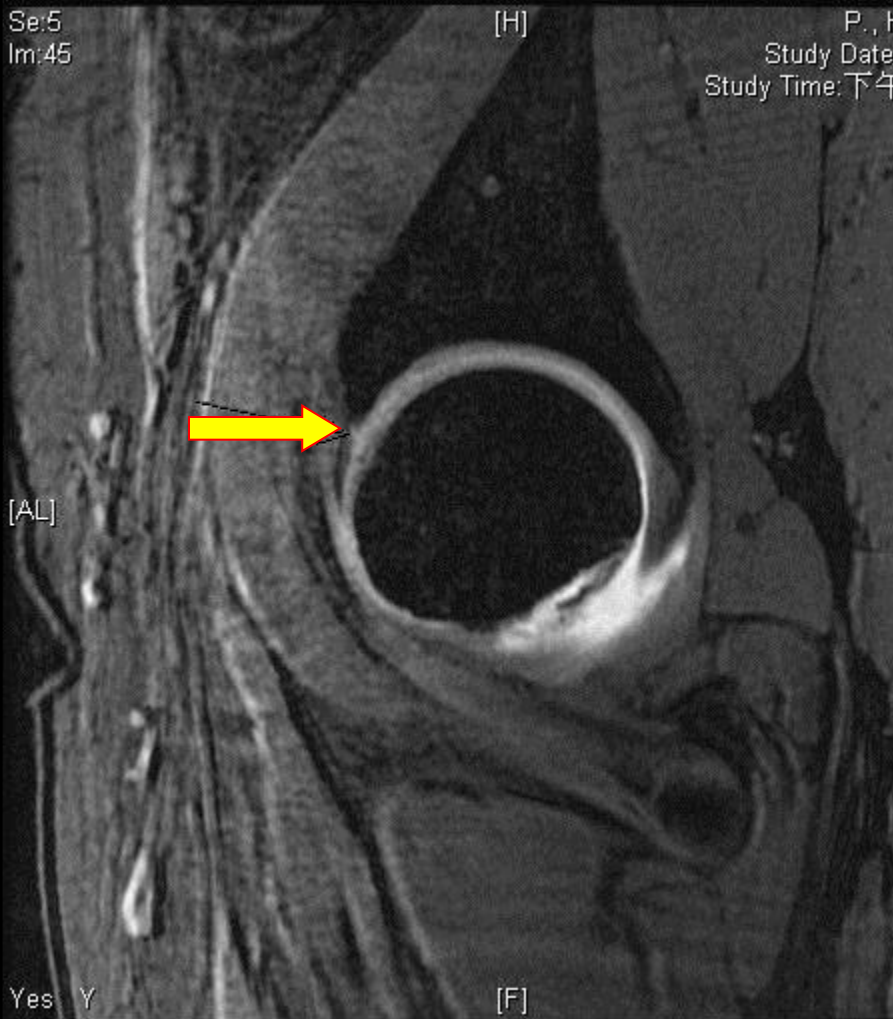
17 years old, kickboxing (Tae Kwon Do) athlete

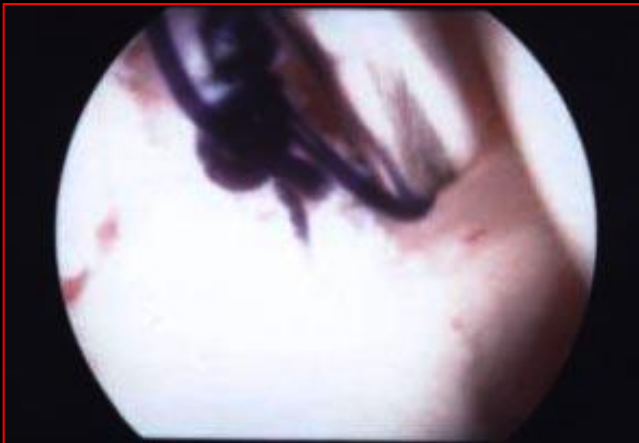
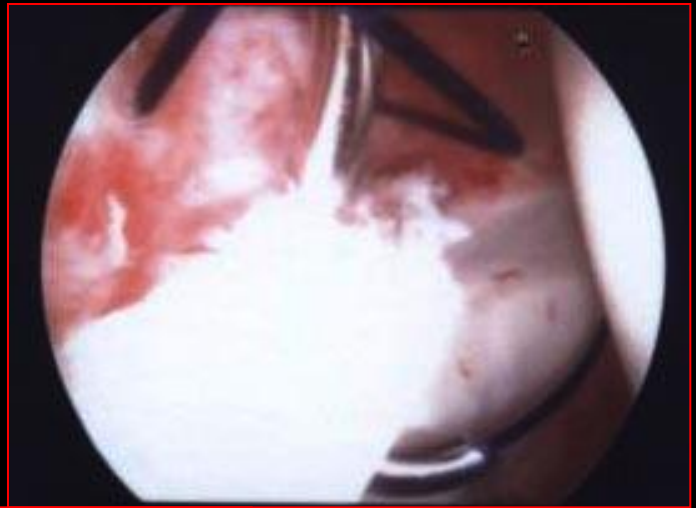
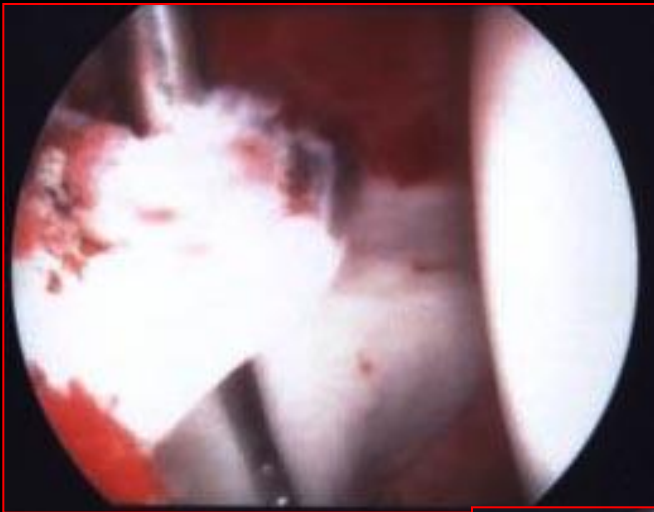


Lt hip anterosuperior labral peripheral tear



Bio-TwinFix repair





Modified Harris Hip Score

➤ **Pain (0 ~ 44)**

➤ **Functional Gait**

Limp 0 ~ 11

Support 0 ~ 11

Distance walked 0 ~ 11

➤ **Functional Activity**

Stairs 0 ~ 4

Socks/Shoes 0 ~ 4

Sitting 0 ~ 5

Public Transportation 0 ~ 1

➤ **Satisfactory Result**

Excellent 90-100

Good 80-90

➤ **Unsatisfactory Result**

Fair 70-80

Poor < 70



Small Incision Wound

Results



Injury Mechanism

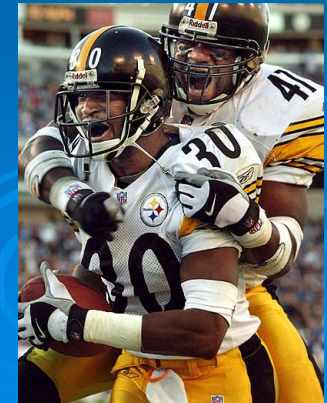
Sports Injury 10(16%)

- Golf 2
- Basketball 3
- Tennis 1
- Running 3
- Dancing 1

Trauma 25(40%)

- Traffic accident 12
- Falling down 13

Non-known 27(44%)



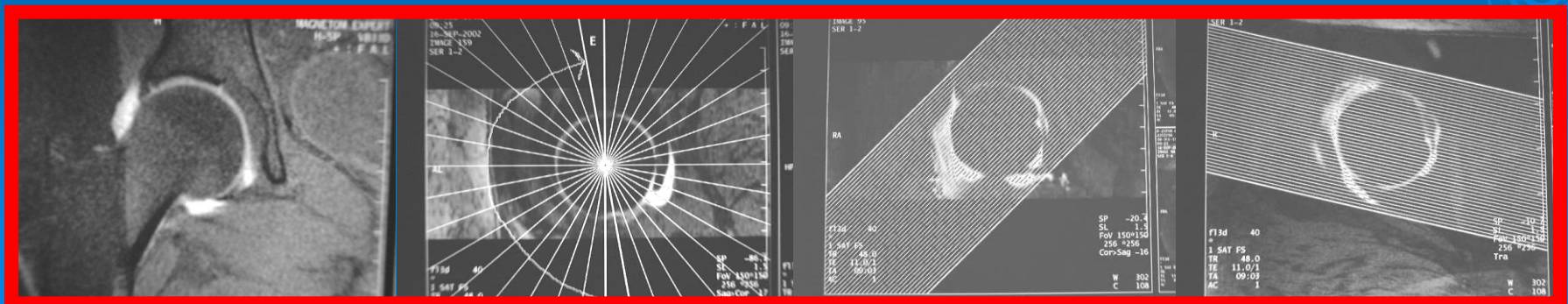
Labral Tears

Type

- Radial flap tear 25
- Degenerative tear 15
- Bucket-handle tear 8
- Horizontal cleavage 3
- Longitudinal tear 11

Location

- Anterior 1
- Superior 2
- **Ant-Sup 55**
- Posterior 4



Modified Harris Hip Score

		Labrum alone N=50		Labral & Chondral damage N=12	
		PreOP	PostOP (5 yrs)	PreOP	PostOP (5 yrs)
MHHS		68(<u>+</u> 13)	96(<u>+</u> 6)*	62(<u>+</u> 17)	85(<u>+</u> 5)*
Satis- factory	Excellent	1	46	0	8
	Good	4	2	0	0
Unsatis- factory	Fair	21	2	5	0
	Poor	24	0	7	4 (THA)

* $P < 0.05$ (Mann-Whitney test)

Complications

Mild chondral injury	13/62
Traction injury	0

Complications of Hip Arthroscopy: Analysis of 73 Cases

Yang-Pin Lo, MD; Yi-Sheng Chan, MD; Li-Chang Lien¹, MD; Mel S-S Lee, PHD;
Kuo-Yao Hsu, MD; Chun-Hsiung Shih², MD

Chang Gung Med J 29:32-38, 2005

- **The efficacy of partial limbectomy has confirmed the responsibility of this structure as a cause of hip pain**

Byrd Operative Hip Arthroscopy 1998

Fitzgerald Clin Orthop 1995

- **Mechanical symptoms disappeared dramatically after partial limbectomy for labral tear, similar to the partial meniscectomy for meniscal tear in the knee**

Yamamoto et al Arthroscopy 2005

- **Removal of the labrum does not significantly increase the loading pressure & not predispose the hip joint to premature osteoarthritis**

Konrath et al J Bone Joint Surg Am 1998

- **Simple debridement of the damaged portion of the labrum seemed not to have the subluxation potential, but great care must be taken in the partial limbectomy, especially avoiding an overzealous resection**

Byrd & Jones Arthroscopy 2003

Lesion Site & Type

- The major site of labral tears: the anterosuperior part of the acetabular rim

Klaue et al J Bone Joint Surg Br 1991

Fitzgerald Clin Orthop 1995

Lage et al Arthroscopy 1996

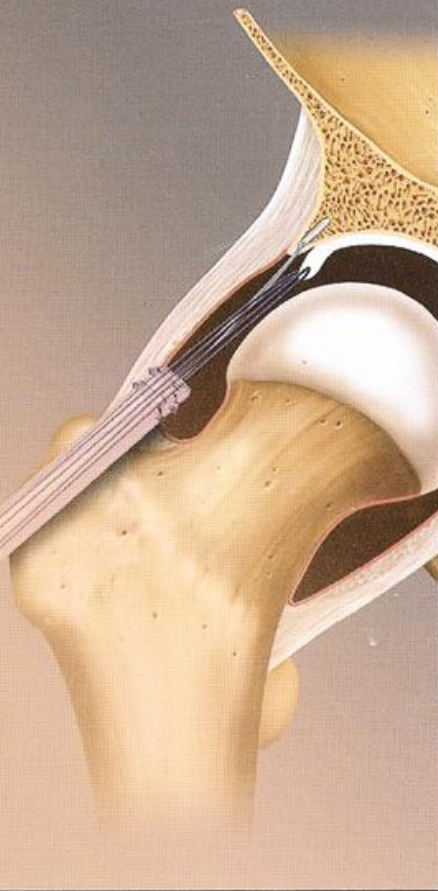
Yamamoto et al Arthroscopy 2005

- In this series(62 hips):
 - The anterosuperior part in 55 hips (88.7%)
 - The radial flap tear type in 25 hips (40.3%)

Clinical Results

	Case No.	F/U Yrs	Satisfactory Result
➤ Fitzgerald 1995	56	4.5	89%
➤ Santori 2000	58	3.5	67%
➤ Byrd T 2000	23	2	
Labrum alone	15		94%
Labrum + chondral	8		60%
➤ Our study 2010	62	5	
Labrum alone	50		96%
Labrum + chondral	12		75%

Hip Labral Repair



Hip Labral Repair

- Labral tears can be treated with debridement and surgical repair.
- A bioabsorbable suture anchor is needed to stabilize the fibrocartilaginous tissue back to the rim of the acetabulum when the labrum is detached from the bone.

Philippon MJ

Clin Sports Med. 2006

Instr Course Lect. 2006

Arthroscopy. 2007

Arthroscopy. 2006

Murphy KP

Hip Labral Repair

- Repair of the torn labrum may help re-establish the anatomic function of the labrum, thereby preventing biomechanical compromise through surgical debridement, which may lead to degenerative changes associated with osteoarthritis.
- **Although long-term results are still unknown, results of short-term follow-up are positive.**

Conclusion I

- **With the help of the new instrument and experienced technique, the quick return of the patients to normal daily activity or sports after hip arthroscopy demonstrates the effectiveness of this procedure.**

Conclusion II

- In adult with hip pain, the diagnosis of acetabular labral tear should be considered.
- Labral tears are the good indications for hip arthroscopy.

Conclusion III

- MR arthrography, a safe method, may have high accurate rate in diagnosis for hip labral lesions.
- MRAr provided the detailed information to the surgeon preoperatively and avoided the unnecessary operations for the patients if the diagnosis was not definitely confirmed.

Hip Arthroscopy for Labral Tears

- **Precise diagnosis**
- **Good surgical Indications**
- **Proper patient selection**
- **Good hip instrumentation**
- **Experienced hip arthroscopic technique**
- **The results of labral tears with osteoarthritis in aging patient is not predictable.**

Thanks for your attention

A nighttime photograph of the Chang Gung Memorial Hospital at Linkou. The hospital's modern, multi-story buildings are illuminated with warm lights, and their lights are reflected in a calm body of water in the foreground. The sky is a deep blue, and the overall scene is peaceful and well-lit.

**Department of Orthopedic Surgery
Chang Gung Memorial Hospital at Linkou**