CHICAGO SPORTS MEDICINE SYMPOSIUM 2018 WORLD SERIES OF SURGERY

fore FOUNDATION for ORTHOPAEDIC RESEARCH and EDUCATION

It's All About the Correction of FAIS

Joshua Harris, MD

HOUSTON Methodist ORTHOPEDICS & SPORTS MEDICINE

Disclosures

Research support: Smith & Nephew, Depuy Synthes, Ossur; Consultant: NIA Magellan, Smith & Nephew, Ossur;
Royalties: SLACK, Inc.;
Editorial board: Arthroscopy, Am J Orthop, Arthritis Res UK;
Committees: AANA, AOSSM, AAOS, ACOEM

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FAI Correction >>> Labrum

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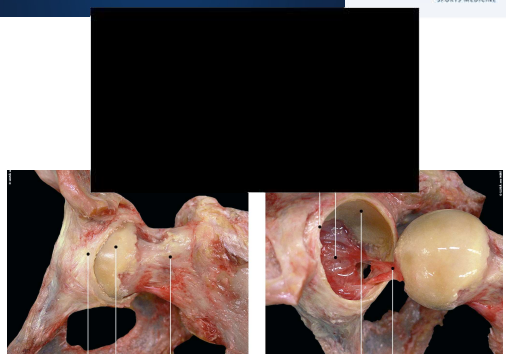
Goal:

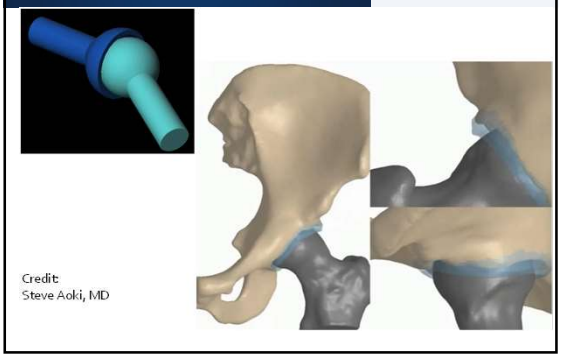
#1 - ***PROVE*** to you, unequivocally, that patient outcome is primarily due to correction of FAIS

#2 – Give you top 5 tips on how to comprehensively correct FAIS every time

What is Normal?

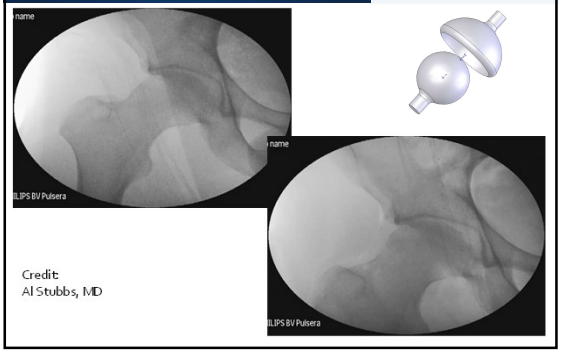


Round Ball, Round Socket



Credit:
Steve Aoki, MD

End Result



Credit:
Al Stubbs, MD

FAI #1 Cause of Labral Tear

Clin Orthop Relat Res (2011) 469:831–838
DOI 10.1007/s11999-010-1539-6

CLINICAL RESEARCH

CT Reveals a High Incidence of Osseous Abnormalities in Hips with Labral Tears

Mark M. Dolan MD, Benton E. Heyworth MD, Asheesh Bedi MD, Gavin Duke MD, Bryan T. Kelly MD

90%

CLINICAL ORTHOPAEDICS AND RELATED RESEARCH
Number 430, pp. 145–150
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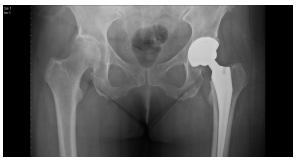
Acetabular Labral Tears Rarely Occur in the Absence of Bony Abnormalities

Doris E. Wenger, MD; Kurtis R. Kendell, MD*; Mark R. Miner, MD†; and Robert T. Trousdale, MD‡*

87%

FAI #1 Cause of OA

70-90% of OA that leads to THA is due to FAI



CLINICAL ORTHOPAEDICS AND RELATED RESEARCH
Number 417, pp. 112–120
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Femoroacetabular Impingement

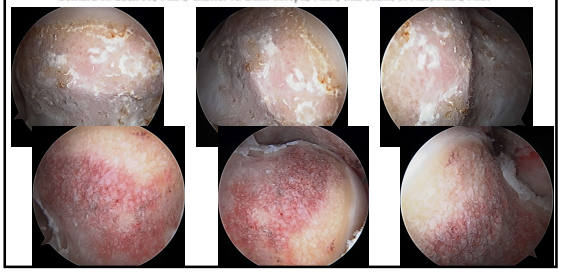
A Cause for Osteoarthritis of the Hip

Reinhold Ganz, MD; Javad Parvizi, MD**; Martin Beck, MD*; Michael Leunig, MD*; Hubert Nötzli, MD*; and Klaus A. Siebenrock, MD**

Residual FAI #1 Cause of Failed Hip Arthroscopy

Revision Hip Arthroscopy: A Systematic Review of Diagnoses, Operative Findings, and Outcomes

Gregory L. Cvetanovich, M.D., Joshua D. Harris, M.D., Brandon J. Erickson, M.D., Bernard R. Bach Jr., M.D., Charles A. Bush-Joseph, M.D., and Shane J. Nho, M.D., M.S.



Residual FAI #1 Cause of Failed Hip Arthroscopy

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Arthroscopic Hip Revision Surgery for Residual Femoroacetabular Impingement (FAI)

Surgical Outcomes Compared With a Matched Cohort After Primary Arthroscopic FAI Correction

Revision Hip Preservation Surgery With Hip Arthroscopy: Clinical Outcomes

Revision hip arthroscopy: findings and outcomes

Revision Hip Arthroscopy Indications and Outcomes: A Systematic Review

>90%

Quantitative evaluation of residual bony impingement lesions after arthroscopic treatment for isolated pincer-type femoroacetabular impingement using three-dimensional CT

Clinical Orthopaedics and Related Research

SYMPOSIUM: 2016 BERNESE HIP SYMPOSIUM

What Are the Risk Factors for Revision Surgery After Hip Arthroscopy for Femoroacetabular Impingement at 7-year Followup?

Pascal Cyrill Haefeli MD, Christoph Emanuel Albers MD, Simon Damian Steppacher MD, Moritz Tannast MD, Lorenz Büchler MD

Cam Deformity Is the Most Common Reason for Revision Hip Arthroscopy: A Three-dimensional CT Study

James R. Ross MD, Christopher M. Larson MD, Olusanjo Adeyeye MD, Bryan T. Kelly MD, Ashesh Bedi MD

Dynamic Hip Examination for Assessment of Impingement During Hip Arthroscopy

Renato Locks, M.D., Jorge Chahla, M.D., Justin J. Mitchell, M.D., Eduardo Soares, M.D., and Marc J. Philippon, M.D.

Revision Arthroscopy Outcomes

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Get it right the first time!!

Conclusion: Arthroscopic hip revision surgery for residual FAI yielded significantly improved outcome measures, but these were inferior to those after primary arthroscopic FAI corrective surgery. Improved femoral head-neck offset after cam decompression, identification and treatment of subspine/AIIS impingement, labral preservation/reconstruction, and capsular preservation/plication may be paramount to achieve satisfactory outcomes.

arthroscopy (59.7%). **Conclusions:** The current evidence examined in this review supports revision hip arthroscopy as a successful treatment option to improve functional outcomes (modified Harris Hip Score) and relieve pain in patients with residual symptoms after primary FAI surgery, although the outcomes are inferior when compared with a matched cohort of patients undergoing primary hip arthroscopy for FAI. The main indication for revision is a candidate who has symptoms due to residual cam- or pincer-type deformity that was either unaddressed or under-resected during the index operation. However, it is important to consider that the studies included in this review are of low-quality evidence. Surgeons should consider incorporating a minimum 2-year follow-up for individuals after index hip-preservation surgery because revisions tended to occur within this time frame. **Level of Evidence:** Level IV, systematic review of Level III and IV studies.

Conclusion: *In conclusion, young patients who required revision hip arthroscopic surgery showed significant improvement in patient-reported outcome scores;* however, final outcome scores in the revision group for sport activity, general health, and satisfaction were lower than those in the primary group. Patients who underwent 1 revision surgical procedure had higher outcome scores than patients who underwent more than 1 revision surgical procedure.

But…. Caveat Resector!

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Don't over-correct!

In Search of the Spherical Femoroplasty

Cam Overresection Leads to Inferior Functional Scores Before and After Revision Hip Arthroscopic Surgery

Investigation performed at the American Hip Institute, Westmont, Illinois, USA

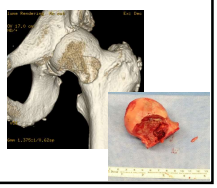
*30% THA conversion
*Lower chance meet MCID
*Lower chance meet PASS

Femoral head-neck junction reconstruction, after iatrogenic bone resection

Alberto Guevara-Alvarez[1-*], Nicholas Lash[2] and Martin Beck[3]

Remplissage of the Femoral Head-Neck Junction in Revision Hip Arthroscopy: A Technique to Correct Excessive Cam Resection

Jonathan M. Frank, M.D., Jorge Chahla, M.D., Justin J. Mitchell, M.D., Eduardo Soares, M.D., and Marc J. Philippon, M.D.



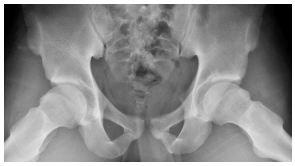
How Common is FAI?

Systematic Review

Prevalence of Femoroacetabular Impingement Imaging Findings in Asymptomatic Volunteers: A Systematic Review

Jonathan M. Frank, M.D., Joshua D. Harris, M.D., Brandon J. Erickson, M.D., William Slikker III, M.D., Charles A. Bush-Joseph, M.D., Michael J. Salata, M.D., and Shane J. Nho, M.D., M.S.

- 26 studies; 2,114 hips – ALL asymptomatic
  - 57% male, 43% female
  - Cam: 37%
  - Pincer: 67%
  - Labral tear: 68%



How Common is FAI?

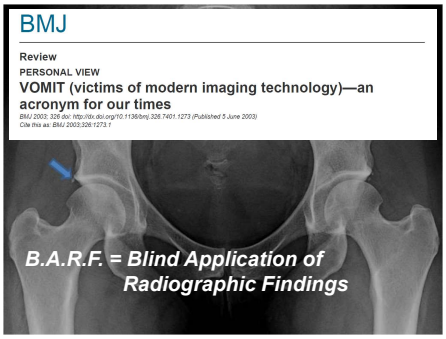
BMJ

Review

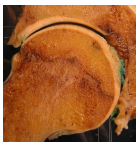
PERSONAL VIEW

VOMIT (victims of modern imaging technology)—an acronym for our times

BMJ 2003; 326 doi: http://dx.doi.org/10.1136/bmj.326.7401.1273 (Published 5 June 2003)
Cite this as: BMJ 2003;326:1273.1



Pelvis is a Ring



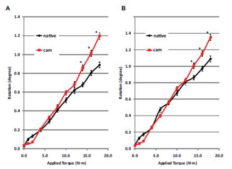
Pelvis is a Ring - AP

The Effect of Dynamic Femoroacetabular Impingement on Pubic Symphysis Motion

A Cadaveric Study

Patrick M. Birmingham,*† MD, Bryan T. Kelly,‡ MD, Robert Jacobs,† BS, Linda McGrady,† BS, and Mei Wang,† PhD

Pubic symphysis rotation @ transverse plane



Pubic symphysis total rotation

Pelvis is a Ring - Spine

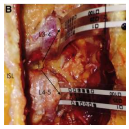
Editorial Commentary: **The Hip Bone's Connected to the Spine Bone—But Correlation Does Not Equal Causation**

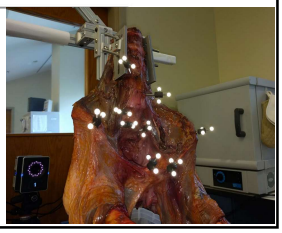
Joshua D. Harris, M.D.
Associate Editor

Abstract: A significant correlation was observed between the degree of lumbar spine arthritis and 2 quantitative markers of cam morphology (alpha angle and anterior femoral head-neck offset) in a large osteological collection of cadaveric lumbar spine and femurs. Although this study does not prove causation, it does impart further insight into the "hip-spine syndrome" in nonarthritic hips with proximal femoral asphericity.

The Hip-Spine Effect: A Biomechanical Study of Ischiofemoral Impingement Effect on Lumbar Facet Joints

Juan Gómez-Hoyos, M.D., Anthony Khoury, M.S., Ricardo Schröder, P.T., Eric Johnson, B.S., Ian J. Palmer, Ph.D., and Hal D. Martin, D.O.





Pelvis is a Ring - ACL

Editorial Commentary: The Hip Bone's Connected to the Knee Bone, but Correlation Does Not Equal Causation—The Association of Hip Motion, Femoroacetabular Impingement, and Anterior Cruciate Ligament Injury

Joshua D. Harris, M.D., Associate Editor

Range of motion and radiographic analysis of the hip in patients with contact and non-contact anterior cruciate ligament injury

Osmar Valadão Lopes Jr. · João Luiz Elkera Gomes · Leandro de Freitas Spinelli

Influence of hip restriction on noncontact ACL rerupture

João L. Ellera Gomes · Humberto M. Palma · Roberto Ruthner

Limited hip rotation and non-contact anterior cruciate ligament injury: A case–control study

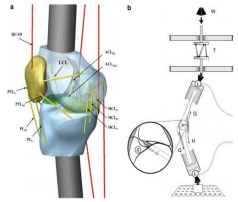
Kōji Tainaka [a,d], Tsuyoshi Takizawa [a], Hiroyuki Kobayashi [b], Masakazu Umimura [c]

Decreased femoral head–neck offset: a possible risk factor for ACL injury

Marc Philippon · Christopher Dewing · Karen Briggs · J. Richard Steadman

Restricted Hip Rotation Is Correlated With an Increased Risk for Anterior Cruciate Ligament Injury

Corin Vandenberg, M.D., Eileen A. Crawford, M.D., Elizabeth Sibilsky Enselman, M.Ed., A.T., C.C.R.P., Christopher B. Robbins, Ph.D., Edward M. Wojtys, M.D., and Ashesh Bedi, M.D.



Pelvis is a Ring - UE

Pitch Volume and Glenohumeral and Hip Motion and Strength in Youth Baseball Pitchers

Josie L. Harding, MS*; Kelsey J. Picha, MS, ATC†; Kellie C. Huxel Bliven, PhD, ATC*

*Department of Interdisciplinary Health Sciences, Arizona School of Health Sciences, A.T. Still University, Mesa; †University of Kentucky, Lexington

Glenohumeral and Hip Range-of-Motion and Strength Measures in Youth Baseball Athletes

Kelsey J. Picha, MS, ATC*; Josie L. Harding, MS, ATC†; Kellie C. Huxel Bliven, PhD, ATC†

Relationship Between Tightness of the Hip Joint and Elbow Pain in Adolescent Baseball Players

Manabu Saito,* PT, Tomonori Kenmoku,†‡ MD, PhD, Kentaro Kameyama,* PT, Ryo Murata,§ MD, PhD, Takashi Yusa,* PT, Nobuyasu Ochiai,‖ MD, PhD, Takehiro Kijima,† MD, Naonobu Takahira,† MD, PhD, Kensuke Fukushima,† MD, Noriyuki Ishiga,¶ MD, PhD, and Masashi Takaso,† MD, PhD

Decreased hip flexion, IR (cam morphology)

*Increased elbow inj risk
*Increased shoulder inj risk
*Less shoulder motion (IR)
*Less shoulder motion (TAROM)

Pelvis is a Ring – JD Kelly, IV

Correlation Between Cam-Type Femoroacetabular Impingement and Radiographic Osteitis Pubis

Elizabeth Phillips, BS; Viviane Khoury, MD; Andrew Willmot, MD; John D. Kelly IV, MD

Orthopedics. 2016;39(3):e417-e422 https://doi.org/10.3928/01477447-20160404-03

Posted April 12, 2016

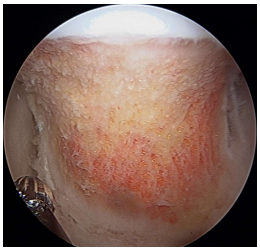
Correlation Between Femoroacetabular Impingement and Hamstring Tendon Pathology on Magnetic Resonance Imaging and Arthrography

Nakul Talathi, BS; Scott LaValva, BS; Angel Lopez-Garib, MD; John D. Kelly IV, MD; Viviane Khoury, MD

Orthopedics. 2017;40(6):e1086-e1091 https://doi.org/10.3928/01477447-20171020-04

Posted November 8, 2017

How to do it – Tips - #1



Use T capsulotomy –
If you can't see it,
you cant treat it

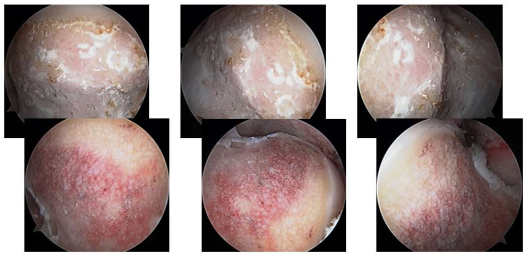
T-Capsulotomy to Improve Visualization of the Peripheral Compartment and Repair

A T- Capsulotomy Provides Increased Hip Joint Visualization compared to An Extended Interportal Capsulotomy: Implications For Improved Capsular Management

Gregory L. Cvetanovich MD, Benjamin Kahan MD, Thomas Wuerz MD, David Levy MD, Alexander E. Weber MD, Jeff Gerybowski MD, Mike Khair MD, Shane J. Nho MD

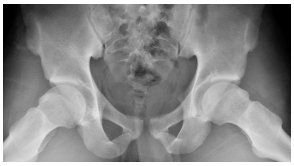
How to do it – Tips - #2

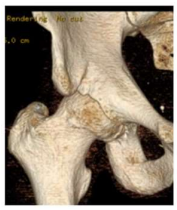
Use multiple arthroscopic views, including dynamic exam, different portals, to confirm accurate correction



How to do it – Tips - #3

Use multiple radiographs (esp Dunn 45), including CT if necessary, to optimally characterize morphology PRE-OP





HIP
ISSN 1120-7000

ORIGINAL RESEARCH ARTICLE

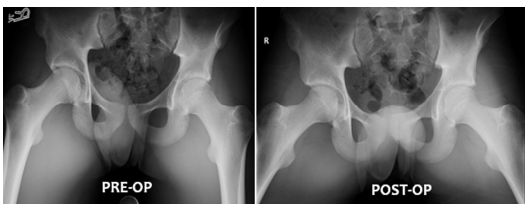
Comparison of MRI, CT, Dunn 45° and Dunn 90° alpha angle measurements in femoroacetabular impingement

Kevin M. Smith, Brayden J. Garria, Patrick C. McCulloch, David M. Lintner, Joshua D. Harris

Houston Methodist Orthopaedics and Sports Medicine, Houston Methodist Hospital, Houston, Texas - USA

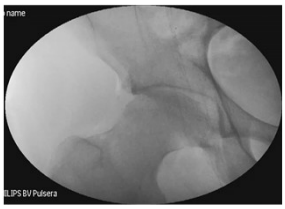
How to do it – Tips - #4

Be critical of your post-op imaging – always strive for perfect, but be prepared to be humble



How to do it – Tips - #5

If you're resecting bone and the x-ray isn't changing –
The solution is to not to keep resecting – AVOID overcorrection



Conclusions

- FAIS related to cam, pincer morphology is common source of hip pain
- Correction of pathomorphology is the primary determinant of outcome
  - Round ball, round socket
  - Correct it perfectly the first time
  - Don't undercorrect
  - Don't overcorrect

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