Thesis Day

Wednesday May 9, 2001

Henry Mankin

Vernon Tolo

Senior Resident Thesis Presentations

James Kasser

First Session

Moderated by James R. Kasser, MD

1. Bipolar Hemiarthroplasty in Juvenile Rheumatoid Arthritis

Andrew Yun, MD
Advisors: Scott Martin, MD and Richard Scott, MD
Discussor: Daniel Estok, MD

Andrew Yun

Daniel Estok

Dr. Andrew Yun retrospectively reviewed 24 patients with JRA who underwent 39 hemiarthroplasties. After an average 12 year follow-up, 14 hips were revised and 25 hips still had their original hardware. Harris hip scores done preop and at the time of follow-up for the study showed a mean improvement of 40 points. Osteolysis around the components was associated with bead shedding of the Osteonics HS2P prosthesis, accounting for 71% of failures requiring revision. Other factors that were found to be significant risks for failure included unilateral replacement and need for acetabular grafting.

Dr. Daniel Estok, in his discussion, noted the challenge in finding an optimal treatment for this very disabling and progressive disease. He discussed the frequent need for nonstandard implants and techniques, as well as the importance of preserving and hopefully restoring bone stock in these young patients. Dr. Estok also commented on the study's finding of progressive acetabular erosion and pointed out the need to closely follow these patients so that revision can be planned while there is still adequate bone stock to hold a hemispheric screw-fixed implant.

2. Total Hip Arthoplasty Using the Modular S-ROM

Greg Erens, MD
Advisor: Greg Brick, MD
Discussor: Dennis Burke,MD


Greg Erens


Dennis Burke

Dr. Greg Erens presented a retrospective review of 63 consecutive patients who underwent revision total hip arthroplasty by a single surgeon. The average time to follow-up was 4.2 years. The mean Harris hip score increased 34 points from preoperative evaluation. He disussed the complications encountered, including 2 hips requiring revision of both components for recurrent dislocation, and a third requiring revision of the acetabular component only for recurrent dislocation. Dr. Erens found that radiographic evaluation showed stable fixation in all femoral components, with only one femur having evidence of osteolysis. He did a comparison with other published series of femoral revisions as well as a series of primary THA using the S-ROM and found this study's results to compare favorably with the literature in terms of rates of re-revision, mechanical failure, and osteolysis.

Dr. Dennis Burke discussed the history of revision hip arthroplasty, noting that cementless revision is the standard. He outlined the development of the S-ROM approximately 20 years ago, and how its 8000 combinations provide excellent versatility, particularly in revision surgery. He commended Dr. Erens on his work evaluating the intermediate-term outcomes of S-ROM for revision arthroplasty, but encouraged the investigators to also analyze the relationship of technique to the higher rate of dislocation in this series.

3. Treatment of Diffuse Pigmented Villonodular Synovitis

Kingsley Chin, MD
Advisor: Greg Brick, MD
Discussor: Henry Mankin, MD


Kingsley Chin


Henry Mankin

Dr. Kingsley Chin reviewed the outcomes of 38 patients with persistent diffuse pigmented villonodular synovitis, who had undergone at least one previous arthroscopic synovectomy, and were then referred for open synovectomy +/- radiation due to ongoing symptoms. 57.9% of the patients had undergone at least one additional procedure after their index synovectomy. 89.5% of patients had noted improvement in symptoms after their synovectomy, but all found their symptoms at latest followup (mean 3.6 years) worse than prior to the first synovectomy. Dr. Chin concluded that arthroscopic synovectomy may alleviate short-term symptoms but if it fails to eradicate DPVNS, it may delay more aggressive, definitive treatment. Longterm MRI followup was recommended to monitor staging of disease and assess results of arthroscopic synovectomy.

Dr. Henry Mankin served as discussor for this work, giving a historical perspective to the proposed etiologies and treatments of DPVNS. He raised the question as to whether radiation around the knee should be limited when the patient may likely require future surgery. He commented on the need for further research into the genetics of DPVNS, as well as into the outcomes of various treatment protocols, including the possibility of a prospective trial of open synovectomy vs open synovectomy with radiation.


Harry Rubash

Second Session

Moderated by Harry E. Rubash, MD

4. A Comparison of Clinical Management Systems

Shawn Hayden, MD, PhD
Advisor: James Herndon, MD, MBA
Discussor: John Emans, MD


Shawn Hayden


John Emans

Dr. Shawn Hayden presented his work evaluating the current requirements of a Clinical Management System (CMS), and then comparing commercially available systems against this benchmark. He subdivided the four main aspects of a CMS (the electronic health record, the technology functions, the practice management, and the consumer functions) in order to better allow for comparison. Dr. Hayden found that no companies exceeded the benchmark, one met it in all four categories, two met it in three categories, and three companies met it in two categories. He highlighted the importance of standards for comparing potential systems as well as the need for newer improved systems to allow physician groups to better comply with increasingly stringent regulations.

Dr. John Emans, in his discussion of this work, pointed out the importance and relevance for younger physicians to educate themselves in the new advances as they go out into practice. He noted that with the new requirements for rigorous coding practices and compliance with HIPPA, information systems will become crucial for physicians with regards to privacy of patient information, billing of procedures and visits, and practice management.

5. Reconstruction of Symptomatic Chronic Achilles Tendon Disorders with Flexor Hallucis Longus Transfer

Domingo Cheleuitte, MD
Advisor: Michael G. Wilson, MD
Discussor: George Theodore, MD


Domingo Chelleuitte


George Theodore

Dr. Domingo Cheleuitte retrospectively reviewed 29 patients with 32 feet treated by a single surgeon with FHL transfer for symptomatic chronic Achilles tendon disorders. At mean follow-up time of 30.7 months, the patients' mean MODEMS score was 79 and the mean AOFAS ankle-hindfoot score was 87, with patients having chronic tears averaging higher scores than those with tendinitis. There was no significant difference between patients who had undergone prior Achilles surgery and those in whom this index surgery was the primary. Patients receiving workers' compensation had significantly lower scores. Dr. Cheleuitte did note that there was a 44% wound complication rate of the patients in this study.

Dr. George Theodore highlighted the fact that while solutions for chronic Achilles tendon disorders remain controversial, FHL transfer shows promise as a salvage procedure. He noted that there was a broad range of pathology included in this study and that MRI correlation would allow for better stratification of preop pathology. He also discussed various methods of fixation and proposed that suture anchor could allow for less soft tissue dissection in an area with already compromised blood supply, possibly decreasing the wound problems associated with this surgery.

6. Effect of Subacromial Decompression on the Stability of the Acromioclavicular Joint: Biomechanical Testing in a Cadaveric Model

Ashwin Deshmukh, MD
Advisor: Gary Perlmutter, MD
Discussor: Jon J.P. Warner, MD


Ashwin Deshmukh


J.P. Warner

Based on recent clinical data that raised concern that arthroscopic subacromial decompression may lead to instability of the acromioclavicular joint, Dr. Ashwin Deshmukh used a cadaveric model to study the effects of subacromial decompression on AC joitn compliance. He tested nineteen fresh frozen cadaveric shoulders by using a machine-applied force in the anterior, posterior, and superior directions to assess for AC joint motion using infrared measurement. Dr. Deshmukh reported that the compliance of the AC joint was increased by a statistically significant amount in the anteroposterior and superior directions after the specimens underwent subacromial decompression, compared to the native state. He postulated that these in vitro findings could account for the increased incidence of AC joint instability, tenderness, and lower outcome scores in this patient population.

Dr. Jon Warner, in his discussion of the thesis, commended the work for addressing a relevant clinical question through laboratory research. He noted that coplaning of the clavicle, which was done in this study, does violate the AC joint, but pointed out that this is not always done in practice. He encouraged the further exploration of this topic through randomized study to better understand how surgical technique may affect outcome in patients with acromial spurring.


Thomas Thornhill

Third Session

Moderated by Thomas S. Thornhill, MD

7. Prevention of Epidural Adhesion using Novel Elastomeric Polypeptide Matrix

David H. Kim, MD
Advisor: Paul Glazer, MD
Discussor: Frederick Mansfield, MD


David Kim


Frederick Mansfield

Dr. David Kim used a rabbit laminectomy model to evaluate the effects of a new biomaterial (gel and membrane forms) in preventing postoperative epidural fibrosis. He studied sixteen rabbits who underwent two level discontinuous lumbar laminectomy, with one of two barrier materials implanted at one level, and the other level serving as an internal control. Analysis of gross and histologic sections at eight weeks postop revealed significantly decreased epidural fibrosis with both gel and membrane barrier materials compared to control. There was no adverse effecton wound healing noted.

Dr. Mansfield, in his discussion, noted that 5-10% of patients who undergo spine surgery will require reoperation, and epidural fibrosis is found in approximately 30% of these patients. Fat grafts, gel foam, and other methods have been used in an attempt to prevent this complication. Dr. Mansfield encouraged the future study of this biomaterial's effect of dural healing, and questioned the long-term effect on fibrosis in the operative site, once the biomaterial has dissolved.

8. Long-term Survivorship of Total Knee Arthroplasty Following Unicondylar Knee Arthroplasty Failure

David Golden, MD
Advisor: Scott Martin, MD
Discussor: William Tomford, MD


David Golden


William Tomford

Dr. David Golden presented his work analyzing the long-term outcomes (minimum ten years) for 32 total knee arthroplasty performed in 30 patients who had prior failed unicompartmental knee arthroplasty. His average follow-up time was 13.2 years. Dr. Golden found that the mean survivorship of the UKA was 58 months in these patients, and failure was related primarily to loosening, malpositioning, or disease progression. In the TKA procedures, there was a 41% failure rate, primarily related to aseptic loosening or instability. Using Kaplan-Meier cures, Dr. Golden found an 81% survivorship of the TKA at 10 years, dropping to 55% at 15 years.

Dr. Tomford led the discussion, noting that UKA failure was related to technical problems in 65% of patients, and poor selection in 20%. He commended the study for its excellent long-term follow-up. He noted that based on these data, UKA is not conservative treatment and does not seem to lead to easier or more successful revision arthroplasty.


Benjamin Bierbaum

Fourth Session

Moderated by Benjamin Bierbaum, MD

9. Clinical Outcomes of Tibial Shaft Fractures in Patients over Age Fifty Treated by Intramedullary Nailing

Louis A. Bley, MD
Advisor: Mark Vrahas, MD
Discussor: A. Seth Greenwald, D-Phil Oxon


Louis Bley


Seth Greenwald

Dr. Louis Bley performed a retrospective review of 42 patients, over age 50, whose tibial fractures were treated with IM nailing at two Boston-area hospitals. Classification of the fractures revealed 38% O.T.A type A, 31% O.T.A type B, and 31% O.T.A. type C. Twenty-four percent were open fractures. Average time to clinical union was 23.5 weeks, with average time to radiographic union recorded as 24 weeks. Delayed union occurred in 36%, and nonunion in 17%, with 44% of patients requiring at least one additional surgery to achieve union. Malunion was more common in fractures above the isthmus.

In his discussion, Dr. Greenwald noted the higher rate of complications in patients with open fractues than in other published studies. He commended the study for addressing some medical comorbidities but urged further analysis of other factors, including tobacco, alcohol use, and steroid use on outcome. He encouraged further evaluation of how the type of nail and locking mechanism used may have affected fusion rates.

10. Tibial Tubercle Osteotomy in Revision Total Knee Arthroplasty

Sonu Ahluwalia, MD
Advisor: Dennis Burke, MD
Discussor: Andrew Freiberg, MD

Sonu Ahluwalia

Andrew Frieberg

Noting that adequate exposure in revision total knee arthroplasty is frequently challenging, Dr. Sonu Ahluwalia evaluate the outcomes of twenty-two patients who underwent tibial tubercle osteotomy during their revision procedures. The procedure entailed a proximal step cut, distal feathering, retention of lateral soft tissue, minimum 8cm length, and minimum 3-wire fixation, performed by a single surgeon. Dr. Ahluwalia found that all demonstrated union by 6 months, with two healing with superior migration. There was a 10 degree extensor lag in one patient who did not clinically need a revision. The Knee Society Pain and Function Scores increased an average of 30 and 24 points, respectively. Re-osteotomy was performed in five re-revisions for infection with a 100% union rate.

Dr. Freiberg congratulated the authors on their review. He noted the reliable healing with this technique, making it an excellent choice for revision, by avoiding the scar formation or soft tissue weakening seen with other techniques for exposure. He did note that fixation with four cerclage wires has twice the strength of three wires, and would likely prevent the proximal migration seen in two of these patients.

Awards

The Harvard combines Orthopaeidc Residency Program would like to thank Dr. Jack Barrett for his support of the two awards presented on Osgood Thesis Day for the best clinical and basic science presentations. Dr. David Kim was selected for the best basic science presentation for his study entitles, “Prevention of Epidural Adhesions using Novel Elastomeric Polypeptide Matrix.” Dr. Domingo Cheleuitte was recognized for the

Thesis presenters along with Dr Herndon and Dr Tolo

Winners of the Best Thesis Award with Dr Herndon and Dr Barrett