A Publication of the
American Association for Hand Surgery

HAND SURGERY QUARTERLY

Autumn
2008

www.handsurgery.org
444 E. Algonquin Road
Arlington Heights, Illinois
60004

MESSAGE FROM THE PRESIDENT

Annual Meeting

The preparation for the annual meeting is in full swing. Miguel Pirela-Cruz and Rebecca Von der Heyde have finalized an outstanding program. The brochure has mailed and registration is now open online. The meeting is full of education, camaraderie, and social events in the spectacular location of Maui, Hawaii. The guest speakers include: Daniel Gottleib, a psychologist and family therapist. Since 1985, Gottlieb has been hosting "Voices in the Family," an award-winning mental health call-in radio show. Gottlieb was in a near-fatal automobile accident, which left him quadriplegic. He has since published numerous books and his recent, "Learning From the Heart: Lessons on Living, Loving and Listening," describes some of the many lessons he's learned about what we share as humans. Dan will share his unique perspective on life during his lecture and his book will be available for sale and book signing afterwards.

SCOTT H. KOZIN, MD

Another keynote speaker will be Andrew W. Gurman, MD, a Pennsylvania orthopaedic hand surgeon, who is vice speaker of the AMA House of Delegates. Dr. Gurman presides over the policy-making body of the nation's largest physician organization. Dr. Gurman will provide information critical to the practicing physician and will encourage physicians to become personally involved in the AMA and the political process. The Danyo Lecturer will be Lewis Carter, MD an AAHS member who concentrates his time in Africa. All these speakers with further enhance the educational program.

HAND

Your journal, *HAND*, is moving forward. It is now available on PubMed Central and the number of submissions continued to increase. The Editor-in-Chief, Elvin Zook is coming to the end of his term. The AAHS requests applications for the Editor-in-Chief. View the call for applications on page 6.

Membership

The membership of the American Association for Hand Surgery continues to increase.

continued

The plans have all been laid for the 39th Annual Meeting this January. The Program at a Glance starts on page 9.

PRESIDENT'S MESSAGE

continued from page 1

However, the bylaws state that "Membership shall cease automatically if dues are delinquent six (6) months after the first day of the fiscal year." To be fiscally responsive, the AAHS Board decided to enforce this important bylaw. There are many benefits to being a member of the hand association, including the subscription to *HAND* and reduced registration at the annual meeting. The Board felt strongly that dues must be paid or membership benefits could not be obtained. Therefore, you may see some reduction in the overall membership numbers, but these reflect the enforcement of the membership bylaws.

Overseas Education

Dr. Naam has continued to move forward in one of the AAHS' goals to be a vehicle for education to developing/emerging countries and hand societies. In this regard, Dr. Naam has organized the second international meeting in the Middle East. The meeting is scheduled to take place in Kuwait in January. The tentative faculty members are Drs. Kozin, Baratz, Berger, Naam, Adams and Russell. The AAHS contingency will travel to Kuwait the third week in January, and we are excited to share our knowledge with the Kuwait hand community. We look forward to representing the American Association for Hand Surgery and to further its purpose as an international educator.

I am so excited about the annual meeting in Hawaii and hope you will attend. I guarantee your time will be both educational and fun. The AAHS office, especially Alice Romano and Lauren Snider, has been working extremely hard in making the forthcoming annual meeting a successful event. For more details of the annual meeting, please visit the website at www.handsurgery.org/meeting.

If you have any questions please contact me directly.

Thank you for continuing your membership in the American Association for Hand Surgery. We look forward to seeing you in Maui, and towards a successful 2009 filled with new opportunities. H

View from the Grand Wailea Resort

New Management

Over the past year, your Board of Directors has been exploring opportunities for future growth and development. After considerable investigation, the Board has voted to end its relationship with our current management services provider, Medical Association Management (MAM, through the Illinois State Medical Society). We are transitioning to the American Society of Plastic Surgeon's specialty services management arm, "Specialty Association Management Services" (SAMS). MAM has served us well over the past many years and we are grateful for their dedication and service. However, we believe the challenging times ahead require the resources of a partner that can provide a greater depth of service to help us meet our strategic goals. The "SAMS" group will bring increased resources in education, research, advocacy and health policy, to help AAHS better position itself in the coming years. With a strong advocacy component, SAMS can provide a direct pathway to national medical and surgical organizations, such as ACS, AMA, and other issue-focused coalitions.

The transition will occur in two phases; the first phase will begin on November 1, with the transition of our Executive Headquarters Office to 444 E. Algonquin Road, Arlington Heights, IL 60004. Our phone number will remain the same through the end of the year, and in January we will be adding a toll free number for your use and convenience. Our new fax number is (847) 228 9436. MAM will continue to manage the 2009 Annual Meeting in Maui, and will be on site through the meeting. The transfer of meeting services and financial management will occur by January 31, 2009. We will continue to keep you updated on the transition in future newsletters and other communications.

Scott H. Kozin, MD
AAHS President H

Volunteerism

Last year at this time, I spoke about the passing of a good friend, Lee Gordon. One of Lee's great passions was volunteer service; one of his favorite and recurring places to serve, the Indian Health Service hospital in Chinle, Arizona. The site is, and remains, one of the few spots where hand surgeons can volunteer their services in an underserved region with the United States. The program started in 1994, the result of the interest of a hand surgeon, Charles Hamlin, in improving hand care services there. He has outlined the history of the program's first decade in Clinical Orthopaedics ("Volunteerism on the Navajo Reservation", CORR, 396:35-42, 2002). Eventually, a group of hand surgeons was identified, who expressed a willingness to help out. Over the years, a fairly standard program of Wednesday clinic, Thursday morning surgery, Thursday afternoon clinic and Friday surgery was established. AAHS member Andra Battocchio, the director of rehabilitation services at Chinle, coordinates the surgeon visits, which occur roughly every 3-4 weeks; surgical aftercare and therapy is handled by Ms Battocchio and her staff.

When Lee passed away, his friends discussed possible memorials. I have mentioned previously Health Volunteers Overseas as a place to volunteer, or to donate funds; Lee's friends at ASSH have set up a fund in his name through that society's foundation. I called Andra Battocchio to see if anyone had taken Lee's slots at Chinle; some were open and I decided to go.

I found that it certainly takes more than a passing interest to actually get from Rochester, MN to Chinle, AZ. First of course is getting hospital privileges; even though I have had an Arizona medical license for many years (as it turns out, licensure in any state is sufficient to work in a US government facility), there was a lot of paperwork to go through. Then of course there is getting to Chinle. While there are several ways, I think that the easiest way is to fly to Albuquerque, and then drive- first via interstate (the old route 66) 2 hours to Gallup, NM, and then by 2 lane road another 2 hours to Chinle, in the heart of the Navajo nation. Most of the countryside is pretty empty of people, but full of spectacular scenery.

Two things struck me on arriving in Chinle, population 5400: the Western concept of 'don't fence me in' clearly applied here to cattle and horses as well as people; and the only station I could get on the car's radio was using a language I did not understand. It turns out that language was Navajo, or Dine—still the first language for the vast majority of the 180,000 people who call the Navajo nation's 26,000 square miles—about the size of West Virginia. Although most young people speak English as well, it is quite possible in Chinle or in other parts of the Navajo nation to hear nothing but Dine being spoken. And the lack of fences—also a Dine thing. Most of the land is held in common. Fortunately, Dine cows and horses are pretty smart. They

continued

PETER C. AMADIO MD

The dedicated staff at Chinle

HAND SURGERY QUARTERLY

President
Scott H. Kozin, MD

Editor
Peter C. Amadio, MD

Managing Editor
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Hand Surgery Quarterly is a publication of The American Association for Hand Surgery and is published strictly for the members of AAHS. This publication is designed as a forum for open discussion and debate among the AAHS membership. Opinions discussed are those of the authors or speakers and are not necessarily the position, posture or stance of the Association.

continued from page 3

may wander, but eventually they end up back home.

Since I do not speak Dine, I was glad to discover that there were good translators at the hospital. And Andra Battocchio and her team have created a highly organized process to see patients and do surgery, so that even someone coming for the first time can feel comfortable. Some patients are seen by one surgeon and operated on by a subsequent one; some might come through the ER while you are there; others you might see one day and operate on the next. Bring your stethoscope, though- you will need to do your own preop physicals.

The hospital facilities and surgical suite (there are two OR's) are quite modern. Some of the staff, like Andra Battocchio, are US Public Health Service commissioned officers; others, including many of the surgeons, anesthesiologists and scrub nurses I met, were there doing locum tenens, although some stayed for many months, or came back for several months every year. All these people were highly competent and skilled, and extremely willing to orient a hand surgeon in a new environment. "Wide awake surgery" has definitely not caught on though; pretty much everything is done under general anesthesia.

Chinle Hospital serves an area the size of West Virginia, where cattle and horses wander freely.

The clinics include perhaps 15 patients in a half day, and represented a good variety of common hand problems. Fortunately, for the few days that I was there the ER was relatively quiet. By Friday at 5 p.m. all the patients I had operated on that day had gone home, and, once I had signed all my op notes I was free to go.

Of course, it would not be right to go so far and just get back in the car and leave. As I mentioned, the local scenery is breathtaking, and Navajo history, crafts and culture are all worthy of intensive study and appreciation. I had a great time, and have already signed up to go back. I commend this service to anyone, and would like to take this opportunity to again thank Andra and her team, especially Jodi Tanzillo and Dottie Henry, for making this such a worthwhile experience. H

Vascular Disorders of the Hand/Reimplantation
William C. Pederson, MD

Compressive Neuropathies & CRPS
Daniel Nagle, MD

Thumb Basal Joint Arthritis and Wrist Arthritis
Alejandro Badia, MD

Inflammatory Arthritis of the Hand and Wrist
Matt Tomaino, MD

Distal Radius Fractures
Peter J. L. Jebson, MD

Distal Radioulnar Joint
Brian Adams, MD

Scaphoid Fractures and Non-Unions
Mike Hayton, FRCS

Brachial Plexus Injuries
Randy Bindra, MD

Carpal Instability
Peter Amadio, MD

Fractures of the Metacarpals and Phalanges
Marco Rizzo, MD

Flexor & Extensor Tendon Injuries
Kevin J. Renfree, MD

Infections of the Hand
Kevin D. Plancher, MD, MS, FACS, FAAOS

Congenital Hand Diffferences
Scott H. Kozin, MD

Tumors of the Hand and Wrist
Michael Bednar, MD

Soft Tissue Coverage in the Hands
Loree Kallianen, MD

Tendon Transfers for the Hand
Randy Bindra, MD

Tendon Transfers for the Hand
Peter M. Murray

Tendonopathies and Dupuytren's Contracture
Peter M. Murray, MD

A must-have resource.

Purchase this special limited edition DVD and put the entire 2008 Comprehensive Hand Surgery Review Course at your fingertips. This invaluable resource includes faculty presentations of 18 topics covered on board examinations, the hand surgery certification examination and resident in-training examinations. Recorded during the AAHS 2008 Annual Meeting, it's a resource you'll turn to over and over again.

To place an order, complete the form below and send it via fax or mail. Phone orders will also be accepted. Quantities are limited. ***$175 per copy, includes shipping.***

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Call for Applications

The American Association for Hand Surgery requests applications for the Editor-in-Chief of the journal, Hand. This is the official journal of the AAHS and is a peer reviewed quarterly publication, indexed on PubMed.

The individual selected as the next Editor-in-Chief will assume all editorial duties of the journal in 2010. In the interim period, this individual will assume the position of Associate Editor to assist the present Editor-in-Chief, Dr. Elvin Zook in the editorial responsibilities of the journal. This includes the solicitation of new manuscripts, assignment of manuscripts for review and synthesis of review, scientific copy-editing, and liaison with the Editorial Board and the publisher. He or she will also help solicit and approve advertisements in the journal.

The initial Associate Editor position would be an unpaid position, but if the individual assumes the Editor-in-Chief position, a modest stipend would be paid.

Interested AAHS members should send a letter of interest specifically describing journal editorial experience and an updated curriculum vitae by December 1, 2008 to:

AAHS Journal Committee
Carol L. Lazier, CMP, CAE
VP Governance and Specialty Relations
American Society of Plastic Surgeons
444 East Algonquin Road
Arlington Heights, IL 60005-4664
clazier@plasticsurgery.org
847-981-5405

Invitation from New Transplantation Association

Transplantation of the human hand has long been awaited, debated, criticized and / or celebrated. With 41 hands, 2 forearms and 2 arms transplanted around the globe, the question is no longer *if* satisfactory function can be achieved, but how the risks of chronic immunosuppression can be overcome successfully. Strategies that minimize maintenance immunosuppression have been successfully implemented in organ transplantation in the recent past and realization of such protocols now holds great potential for reconstructive transplantation.

The American Society for Reconstructive Transplantation (ASRT) is a non-profit organization with the mission objective to serve and support science and practice in this field. It is the goal of the ASRT to promote high standards in clinical care, science and the ethical practice of composite tissue transplantation by providing information, training and educational material to surgeons, scientists and physicians. With such a collaborative effort involving surgeons, transplant immunologists, organ procurement organizations and specialists in rehabilitation, psychology and medical ethics we aim to make reconstructive transplantation a safe, efficacious, ethical and routinely applicable therapeutic modality for hand injury, deformity or loss.

We believe that such a goal can be best accomplished in collaboration and collegial interaction with other societies such as the American Association for Hand Surgery. We cordially invite members of the AAHS to also join the ASRT. Membership information and benefits are available at www.a-s-r-t.com.

AAHS Member Wins Rural Physician Award

AAHS member, Nash Naam, MD was informed that he won the "Illinois Rural Health Physician of Excellence Award." This award is given to physicians who serve in rural areas and contribute to expanding health services and facilities in the rural areas.

The association cited Dr. Naam for introducing hand surgery to southern Illinois. He was the first hand surgeon to serve the state of Illinois south of Springfield. The Award is given by the Illinois Rural Health Association. The award was presented to Dr. Naam by the Lieutenant Governor during a formal ceremony in Springfield on Tuesday, September 16, 2008.

Congratulations, Dr. Naam!

5 Simple Steps to Implement Evidence-Based Medicine

By Gretchen Kaiser, OTD, OTR/L, MBA, CHT

How do we get information on how to treat flexor tendon repairs? Traditionally we have relied on our training, what someone has told us, reading a journal, taking a course, talking to colleagues, or just doing it because we have always done it that way. At what point do we question what we are doing and why would we change what has always worked in our hands?

And what is all of this talk about evidence based practice (EBP)? Have you ever sat back and said to yourself, "when *they* finally figure it out, I'll learn or hear about it, and *then* I will change my practice…."

But what if *then* never comes? What can you do now to make sure you are implementing best practice methods? New evidence is being generated, reimbursement patterns are changing, Medicare and Medicaid programs are now looking at outcome based reimbursement, and other professions are trying to crossover into practicing what we have traditionally done as hand therapists. Documentation is more important than ever, and we need to know what is working best and is most effective for the patients we treat.

Using the best available evidence will allow us to implement systematic treatment of our patients. Yes it may be a "new" way and approach to treating patients, and most of us are unfamiliar with this approach, but is it worth it? I think for our patients it is. I think for our financial bottom line it is. I think for the viability of the hand therapy profession it is.

How can the average clinician implement the evidence into practice in the context of their typical day? There are many ways to do this. This is only one of many alternatives to attempt. Let's narrow it down to five simple steps (Sackett et al. 1997).

1. What is the clinical question?
2. Find the highest quality of evidence (to support your intervention)
3. Critically appraise the evidence
4. Apply the results to your patient
5. Evaluate your decision making

How do I apply this?

What do I want to know? Be concise and specific. Try formulating a focused clinical question using the PICO format (http://www.cebm.net/). This may make it easier to search. Making a question too complex could make you crazy at first. You'll spend hours searching and not find what you are looking for. Try, for example, "In patients who have sustained a zone 2 flexor tendon injury, is it better to start early motion versus delayed motion to achieve the best functional outcome?" Using a defined question will help to focus your search.

Let search engines do the work. An easy way to find information in the clinic is to look on free search engines online. Some search engines include:

Google Scholar	OT Seeker
Cochrane Library	Pedro
Acta Orthopaedica	Pub Med
National Guideline Clearinghouse	ERIC

Freemedicaljournals.com

Another good resource is: http://www.otdirect.co.uk. It gives you direct links to a variety of search engines & also offers other information such as help with statistics.

As a member of AAHS, *HAND* is now indexed on Pub Med and you have access to the full-text journal through the AAHS website (www.handsurgery.org). If you are a member of ASHT, you have access to the Journal of Hand Therapy online. Likewise, if you are a member of APTA or AOTA, you have access to their journals online as a member. If you are a clinician practicing in an academic institution, you may have access to that library and search engines. Check with your college alumni association; you may have access to their search engines as a benefit.

GRETCHEN KAISER, OTD, OTR/L, MBA, CHT

Some key terms you could use/combine in your search include (though you'll probably think of a million more):

flexor tendon	motion
rehabilitation	early motion
splinting	delayed motion
zone 2 flexor tendon repair	therapy

Pare down the results. Look into the articles to determine if you want to use them or not; sift through them so you don't have to read every single thing you pull up. To help with this, ask yourself a few simple questions:

1. First and foremost, what is the level of evidence? A randomized control trial is going to be more meaningful than a single case study.
2. What are the results, and is this article useful for you?
3. Is the population in the study similar to yours?
4. Are the results valid?
5. Is it clinically significant?
6. Was it randomized?
7. What is the sample size?
8. Was it a blinded study?
9. Were all patients accounted for?

Apply your findings to your patient. Evidence-based medicine/practice can be defined as,

continued

HAND THERAPY CORNER

continued from page 7

"The conscientious, explicit, and judicious use of the current best evidence in making decisions about the care of individual patients" (Sackett, DL., Spine, 1998).

But what does it look like? EBP means *integrating*:

- individual clinical expertise with
- the best available external clinical evidence from systematic research with
- patient preferences / values (Sackett, DL., 2006).

There is a difference in having 25 years of experience treating patients with flexor tendon injuries, and doing one year of experience 25 times.

Was this the best decision for your patient? How was your outcome? Did you use a patient centered outcome measure?

After finding all of your articles, keep all of the information and work you did in a file with the date on it. The next time you want to do a search, you can just "update" it and you don't have to search through quite so many articles.

In conclusion, it is vital to our profession to implement current research into practice. This, however, does not necessarily mean changing everything you do in your practice. There is still very limited information on many topics, and you may find that what you are doing is the best you can be doing. Use the working definition of EBP above and remember that despite the research, your clinical judgment and the integration of the individual preferences and values is the most critical part of its implementation. Finding simple and easy ways to begin implementing EBP is the key to success in this paradigm shift of thought.

Now, I challenge you to try it! Share what works for you and what doesn't with your colleagues. Tell people what you are doing. Pass it on. You'll help elevate us all! H

HAND THERAPY PROFILE

Jennifer Thompson, MPT, CHT

Personal: I was born in State College, PA while my parents finished their graduate degrees. We, my parents, older brother Joe, and I, relocated to Rochester, NY when I was two. I spent the next 20 years braving the winters in Western, NY so I'm a firm believer in snow is not an excuse to miss therapy appointments. School took me to Pittsburgh, PA. Moving on from there it was to Baltimore, MD, then onto Wilmington, DE, returned close to back home in Batavia, NY, followed by a return to Wilmington, DE. We recently moved (for the last time) to Garnet Valley, PA (outside Philadelphia, PA) where my home is filled with my loving husband, Jay, and son Brady who I can't wait to get back to every day. There is no place like home!

Education: I graduated from the Rochester Institute of Technology with honors and a Bachelor of Science degree in Biology. I quickly realized that I was not meant to spend the rest of my life in a laboratory and entered the University of Pittsburgh's Master of Physical Therapy program. While enrolled I completed a clinical affiliation with the Curtis Hand Center in Baltimore, MD.

Employer: At the close of 2007 I began working for the Philadelphia Hand Center. I am excited again to be working closely with an outstanding group of surgeons and therapists and for the educational opportunities this position allows me on a daily basis. I've benefited from the experience from working in a number of different clinical settings including ATI / Pro Physical Therapy and the University of Rochester / Hand Rehabilitation.

AAHS Involvement: I recently applied for membership to AAHS and attended my first meeting in January this year. I am very much looking forward to Hawaii.

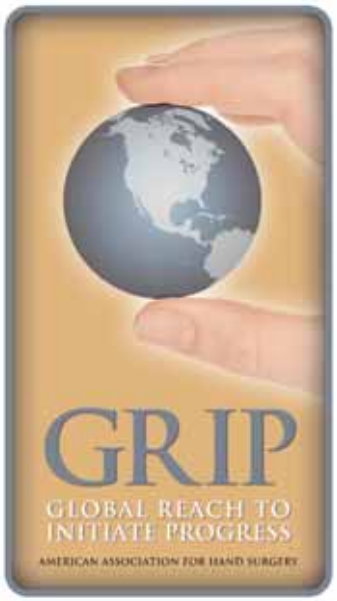
Best Part of My Job: Interacting with patients and observing their transformation as they deal with and recover from a life altering injury gives purpose to my work. The knowledge that I impacted and influenced the outcome is awesome. I draw as much from my patients as they do from therapy.

Major Accomplishments: I was honored to present at the specialty day of the 2008 AAHS meeting in Los Angeles on Basilar Joint Arthritis. This past fall I traveled to several Navajo Indian reservations to assist in the education of their therapy staff.

Clinical Specialties: I thoroughly enjoy splinting and feel it is one of my specialties as a clinician. In terms of patient population I particularly enjoy working with patients diagnosed with any form of arthritis.

Greatest Professional Challenge: Professionally and compassionately rehabilitating patients in our current insurance environment while balancing a full schedule with family life.

Three Words That Describe Me: Efficient, passionate, driven. H



AAHS 39th Annual Meeting

January 7–10, 2009
Grand Wailea Resort
Wailea, Maui, HI

Wednesday, January 7, 2009

6:00–7:00am **Continental Breakfast**

7:00–3:00pm **Specialty Day Program: Complex Trauma: Management and Rehabilitation**

7:00–7:15am **Welcome**
Scott Kozin, MD, President
Miguel Pirela-Cruz, MD, Program Chair
Rebecca Von Der Heyde, MS, OTR/L, CHT, Specialty Day Chair

7:15–8:15am **Traumatic Amputations**

7:15–7:35am **Putting It Back Together Again: Surgical Replantation**
William Dzwierzynski, MD

7:35–7:55am **Finding the Happy Medium: Splinting and Motion Following Replantation**
Gretchen Kaiser Bodell, OTD, OTR/L, MBA, CHT

7:55–8:15am **To Salvage or Not to Salvage? Case Presentations**
Nicholas Vedder, MD

8:15–8:35am **Restoration of Power: Nerve Grafting and Transfers**
Susan Mackinnon, MD

8:35–8:55am **Power Surge: Rehabilitation Following Nerve Grafting and Transfers**
Christine Novak, MS, PT

8:55–9:15am **Role Reversal: Nuts and Bolts of Tendon Transfers**
Scott Kozin, MD

9:15–9:35am **Finding a New Path: Neuromuscular Re-Education**
Aviva Wolff, OTR/L, CHT

9:35–9:55am **Coffee**

9:55–11:00am **Panel: Hands Around the World: Complex Cases from Medical Missions**
Lynn Bassini, MA, OTR, CHT
Sharon Dest, PT, CHT
Sue Michlovitz, PT, PhD, CHT

11:00–12:00pm **Panel: Multi-Trauma Case Presentations**
Miguel Pirela-Cruz, MD, Moderator
Paul Brach, PT, CHT
James Chang, MD
A. Lee Osterman, MD, FACS
Rebecca Von Der Heyde, MS, OTR/L, CHT

12:00–1:00pm **Specialty Day Lunch**

1:00–2:00pm **Case Studies: What I Learn When Things Go Awry: Modified Methods for Maximal Outcomes**
Aviva Wolff, OTR/L, CHT, Moderator
Mary Nordlie, MS, OTR/L. CHT
Ann Lund, OTR/L, CHT
Cia Passig, OTR/L, CHT

2:00–3:00pm **Your Statistician's Diagnosis: How to Tell When You Need a Second Opinion on Your Research Project**
Sue Michlovitz, PT, PhD, CHT
Paul Velleman, PhD

1:00–6:00pm **Trauma Pre-Course: Standard of Care or Stretching the Indications**
William C. Pederson, MD, Moderator
Randy Bindra, MD, Moderator
Additional CME 4.75 Credits. $100 additional registration required.

1:00–1:20pm **Plating is the Optimal Treatment for Displaced Clavicle Fractures**
William Geissler, MD

1:20–1:40pm **Nerve Transfers Provide a More Predictable Outcome Than Proximal Nerve Repairs**
Thomas Tung, MD

1:40–2:00pm **Should We Always Reconstruct the Ulnar Artery in Hypothenar Hammer Syndrome?**
Craig Johnson, MD

2:00–2:20pm **Is Replantation of Single Finger Distal to the FDS Insertion Still a Valid Indication?**
Minoru Shibata, MD

2:20–2:40pm **Q & A**

2:40–3:10pm **Debate: All Minimally Displaced Distal Radius Fractures Should Be Managed Surgically**
Brian Adams, MD
David Nelson, MD

3:10–3:30pm **Break**

3:30–3:50pm **Should All Scaphoid Nonunions Have a Vascularized Bone Graft?**
Alexander Shin, MD

3:50–4:10pm **The Role of Bone-Ligament-Bone Repair for Acute Scapholunate Dissociations**
Richard Berger, MD

4:10–4:30pm **The Hamatometacarpal Joint: Is It Just for Spare Parts for the PIP?**
Greg Sommerkamp, MD

4:30–4:50pm **Usefulness of 2-Stage Reconstruction in Neglected Profundus Tendon Ruptures**
John Taras, MD

4:50–5:10pm **The Role of Ulnar Head Replacement in Distal Ulna Fracture Reconstruction**
Sanjay Desai, MD

5:10–5:30pm **Q&A**

5:30–6:00pm **Debate: All Non-Displaced Scaphoid Fractures Should Be Fixed With a Screw**
Joe Dias, MD
Joseph Slade, MD

5:00–6:00pm **Hand Therapist Reception**

6:00–8:00pm **AAHS Welcome Reception**

continued

Thursday, January 8, 2009

6:00–7:30am **Coffee**

6:30–7:30am **Instructional Courses**

101 **CMC Arthritis: Arthroscopy, Anchovy, & Implants**
Alejandro Badia, MD, Moderator
Robert Beckenbaugh, MD
John Lubahn, MD

102 **Flexor Tendon Repair – Are We Any Better?**
Eduardo Gonzalez-Hernandez, MD, Moderator
Donald Lalonde, MD
Michael Neumeister, MD
Amanda Higgins, OT

103 **Scapholunate Ligament: An Update on Repair**
Richard Berger, MD, Moderator
William Geissler, MD

104 **Success in Private Practice (Surgical Centers, Therapy, Passive Income, Reimbursement)**
Kyle Bickel, MD, Moderator
Allen Berkowitz, MD
Ross Nathan, MD

105 **Total Wrist Arthroplasty: Indications, Surgery and Rehabilitation**
Brian Adams, MD

106 **Treatment of Complications after Wrist Fracture – Malunion, Nonunion, Infection**
Phil Heyman, MD
Rob Medoff, MD
Jorge Orbay, MD
Tom Wright, MD

7:45–8:00am **Welcome**

Presidential Welcome
Scott Kozin, MD

Program Chair Welcome
Miguel Pirela-Cruz, MD

Vargas Award Recipient

ASSH President
L. Andrew Koman, MD

8:00–9:00am **Panel: Minimally Invasive Fracture Fixation - How I Do It!**
Jesse Jupiter, MD, Moderator
A. Lee Osterman, MD, FACS
Alexander Shin, MD

9:00–9:30am **Breakfast**

9:30–10:30am **Hand Editorial Board Meeting**

9:30–11:00am **Concurrent Scientific Paper Session A-1**

9:30–11:00am **Concurrent Scientific Paper Session A-2**

11:15–12:00pm **Presidential Address**
Scott H. Kozin, MD
"The Power of Pinch"

12:00–1:15pm **Keynote Speaker and Book Signing**
Daniel Gottlieb, PhD
"The Art of Caring"

1:15–1:30pm **AMA House of Delegates**
Andrew W. Gurman, MD, Vice Speaker

1:30–2:30pm **Instructional Courses**

107 **Elbow Trauma and Coverage**
Milan Stevanovich, MD, Moderator
Stephen Trigg, MD

108 **Intercarpal Fusions: What Works and What Does Not Work!**
David Bozentka, MD
Steven Moran, MD
Michael Sauerbier, MD

109 **Nerve Compression and Repair**
John Taras, MD, Moderator
Jeff Yao, MD
Robert Spinner, MD

110 **Pediatric Brachial Plexus Injury**
Allen T. Bishop, MD, Moderator
Howard Clarke, MD
Scott Kozin, MD

111 **Scaphoid Fractures and Nonunions: Arthroscopic, Percutaneous, Re-vascularization**
T. Greg Sommerkamp, MD, Moderator
Alexander Shin, MD
Joseph Slade, MD

112 **Tendonitis, Tendonopathy, Tendon Rupture About the Elbow**
Peter Evans, MD, PhD
Jeff Greenberg, MD
Scott Steinman, MD

3:00–5:00pm **Bioskills Courses**

BC-1 **Endoscopic Cubital Tunnel Release**
Tyson Cobb, MD

BC-2 **Avoiding Problems with Distal Radius Fixation**
Miguel Pirela-Cruz, MD
A. Lee Osterman, MD
Mark Rekant, MD
Rob Medoff, MD

BC-3 **Surgical Tips in Treating Distal Radius Fractures**
Jaiyoung Ryu, MD

3:30–4:30pm **Instructional Courses**

113 **Nerve Transfers for the Upper Extremity—What Works**
Susan MacKinnon, MD
Christine Novak, MS PT
Justin Brown, MD

114 **Burn Management**
Roger Simpson, MD

115 **Financial Course – Life Financial Goals for Physicians**
Patrick R. Donnelly, CIMA - Smith Barney Consulting Group
Jeffrey M. Palmer - Smith Barney Consulting Group

Friday, January 9, 2009

6:00–7:45am **Coffee**

6:30–7:30am **Instructional Courses**

116 **Humanitarian Care in a Combat Arena**
Eric Hofmeister, MD, Moderator
Brian Fitzgerald, MD
Gregory Hill, MD
Michael Thompson, MD

117 **Peripheral Nerve Repair and Reconstruction—Glue, Tubes, etc.**
Susan MacKinnon, MD, Moderator
John Taras, MD
Allen Van Beek, MD

118 **PIP Joint – Update on Replacement & Condylar Replacement Techniques**
T. Greg Sommerkamp, MD, Moderator
Peter Murray, MD
Kevin Chung, MD

119 **Radial Head Repair vs. Replacement—Why, When & How!**
Mark Baratz, MD, Moderator

120 **Ulnar Sided Wrist Update – Sauve, Darrach, U-Head**
Kevin Renfree, MD
Luis Scheker, MD
Joseph Slade, MD

121 **Wound Coverage: Kids to Adults**
Nicholas Vedder, MD, Moderator
Benjamin Chang, MD
Anthony Smith, MD

continued

7:45–9:15am **Concurrent Scientific Paper Session B-1**

7:45–9:15am **Concurrent Scientific Paper Session B-2**

9:15–9:45am **Breakfast with Exhibitors**

9:45–10:45am **Panel: How to Maximize Reimbursement in Practice**
Kyle Bickel, MD, Moderator
Steve Leibovic, MD
Daniel Nagle, MD

10:45–11:15am **Joseph Danyo Invited Speaker**
Louis L. Carter, Jr. MD, FACS
"Caring for the Disabled and Deformed in the Emerging World—What a Privilege!"

11:15am–12:00pm **Panel: Update on Nerve Reconstruction – Grafts, Transfers, Glue, Transfers**
Susan Mackinnon, MD, Moderator
Christine Novak, PT, MS, PhD(c)
Alexander Shin, MD
Thomas Trumble, MD

12:00–12:30pm **Annual Business Meeting (AAHS Members only)**

12:45–2:45pm **Board of Directors Luncheon**

12:30–5:45pm **Comprehensive Hand Surgery Review Course**
Additional CME 5.0 Credits
Steven L. Moran, MD, Chairman
$100. Additional Registration Required. Box lunch will be served.

12:30–12:50pm **Tendonopathies and Dupuytrens Contracture**
Jennifer M. Wolf, MD

12:50–1:10 pm **Compressive Neuropathies & CRPS**
Robert Spinner, MD

1:10–1:30pm **Thumb Basal Joint Arthritis and Inflammatory Arthritis**
Marco Rizzo, MD

1:30–1:50pm **Distal Radius Fractures**
David Dennison, MD

1:50–2:10pm **Distal Radioulnar Joint**
Brian Adams, MD

2:10–2:30pm **Scaphoid Fractures and Non-Unions, Kienbocks Disease**
Alexander Y. Shin, MD

2:30–2:50pm **Carpal Instability, Wrist Arthritis**
Steven L. Moran, MD

2:50–3:10pm **Fractures of the Metacarpals and Phalanges**
Brian Carlsen, MD

3:10–3:30pm **Break with Exhibitors**

3:30–3:50pm **Flexor & Extensor Tendon Injuries**
Jeffery Friedrich, MD

3:50–4:05pm **Infections of the Hand**
Kevin D. Plancher, MD, MS, FACS, FAAOS

4:05–4:25pm **Congenital Hand Differences**
Steven L. Moran, MD

4:25–4:45pm **Tumors of the Hand and Wrist**
Carol Morris, MD

4:45–5:00pm **Soft Tissue Coverage in the Hands**
William C. Pederson, MD

5:00–5:20pm **Tendon Transfers for the Hand**
Doug Sammer, MD

5:20–5:40pm **Vascular Disorders of the Hand/ Reimplantation**
Peter M. Murray, MD

7:00–10:00pm **AAHS Awards Dinner/Dance**
Jimmy Mac and the Kool Kats

AAHS-ASPN-ASRM
Saturday, January 10, 2009

6:45–8:15am **Coffee**

7:00–8:00am **AAHS/ASPN/ASRM Instructional Courses**

201 **Pedicled and Free Flap Reconstructionfor Trauma and Tumors of the Upper Extremity**
Amit Gupta, MD
Joseph Upton, MD

202 **Current State-of-the-Art Toe Transfers for Thumb and Finger Reconstruction**
Gregory Buncke, MD
Neil F. Jones, MD
Fu Chan Wei, MD

203 **Introduction to Acupuncture: Principles and Applications**
Lawrence J. Rossi Jr. MD, FAAP, DABMA

204 **Multiple Nerve Transfers for Control of Upper Extremity Myoelectric Prostheses (Targeted Reinnervation)**
Greg Dumanian, MD

205 **Bridging the Nerve Gap**
James Chang, MD
Susan MacKinnon, MD
Allen Van Beek, MD

206 **Brachial Plexus Surgery–What Works and What Does Not Work**
Allen Bishop, MD
Howard M. Clarke, MD, PhD
Robert Spinner, MD

8:15–8:30am **AAHS/ASPN/ASRM President's Welcome**
Scott H. Kozin, MD, AAHS President
Robert C. Russell, MD, ASPN President
Neil F. Jones, MD, ASRM President

8:30–9:30am **AAHS/ASPN/ASRM PANEL: Crisis In Hand Trauma Coverage**
L. Scott Levin, MD, FACS, Moderator
Neil F. Jones, MD
E. Anne Ouellette, MD
William C. Pederson, MD
Luis Scheker, MD
Milan Stevanovic, MD

9:30–10:00am **Breakfast with Exhibitors**

10:00–11:00am **AAHS/ASPN/ASRM PANEL: Medical Diplomacy–Volunteering , Training, and the Military**
Miguel Pirela-Cruz, MD, Co-Moderator
Eric Hofmeister, MD, Co-Moderator
Nash Naam, MD
Eric Thompson, MD

11:00–12:00pm **AAHS/ASPN/ASRM Presidents Invited Lecturer**
Graham Gumley, MD
"Helping Our Hands Restore Their Own Feeling"

12:00pm **AAHS/ASRM Golf Tournament Wailea Country Club: Gold Course**

12:00–5:00pm **ASRM Master Series**

1:00–3:00pm **ASPN Programming**

6:00–8:00pm **ASPN/ASRM Welcome Reception**

Flexor Tendon Surgery

The discussion on the flexor tendon is moderated by ***Michael Neumeister, MD, FRCSC, FACS,*** *Professor and Chair, Division of Plastic Surgery, Southern Illinois University School of Medicine, Springfield, IL. Joining him on the panel are surgeons* ***Wyndell Merritt, MD,*** *Clinical Professor, University of Virginia, Richmond, VA, and* ***Don Lalonde, MD, Msc, FRCSC****, private practice, Saint John, New Brunswick, Canada, and hand therapist* ***Amanda Higgins, OT Reg(NB), Bsc, OT,*** *private practice, Saint John, New Brunswick, Canada.*

Dr. Neumeister: We're all aware that the fine coordination and biomechanical interplay of extrinsic and intrinsic musculotendinous units of our hands are crucial in maintaining normal function of our fingers. Tendon strength and glide remain pivotal in maintaining finger function. Flexor tendon injuries confer obstacles that challenge the return of normal function and range of motion to the involved digit. This dialogue will be focused on current philosophy, technique of repair, and rehabilitation of flexor tendon injuries.

Dr. Merritt, do flexor tendon injuries represent the same formidable challenge today as they once did? Is it any easier today?

Dr. Merritt: I think it's no easier. However, our approach is far more comprehensive than previously. Specifically, we went through a time at the beginning of my career when most surgeons felt you must do a flexor tendon graft rather than a repair in zone 2. We now know that if certain principles are upheld, primary repair is better and has less morbidity than a tendon graft.

Dr. Neumeister: Dr. Lalonde, are you in agreement with this?

Dr. Lalonde: Yes, I am. I started doing flexor tendon repairs in 1979, and at that time Harold Kleinert had just convinced the world that you could repair flexor tendons in zone 2 primarily, and that you didn't have to do flexor tendon grafts. I think that things are much better in the sense that we have newer techniques and newer tools to improve things but it's still a big challenge and still a lot of patients up with stiff fingers – particularly if they're not very compliant.

Dr. Neumeister: In 1959, Erle Peacock coined the phrase "one wound, one scar". As much as that was true back then, do you think that's true today with respect to flexor tendon repairs?

Dr. Merritt: I think that's still a valuable concept. Unfortunately, many people forget the corollary of that concept – that the scar that develops is induced to be most like the tissue to which it's juxtaposed. As a consequence, the one wound milieu will divide into different architectural scar, some of which is more capable of cross-linked slippage of subunits, producing favorable scar for gliding. While this scar differentiation is limited, it is important for ultimate function. For example, scar between two ends of a fracture or the internal diameter of the tendon is hopefully quite different from scar along the gliding epitenon surface and its sheath. However, if you have a comminuted fracture associated with your flexor tendon laceration, no matter how you repair it you're more likely to get a bone-like adherence between the tendon and the raw collagen of the bone. If you have an isolated, clean laceration of the tendon you have a better chance of having favorable scar that permits gliding. This explains the importance of technique, in that rough handling of the tendon and its environment leaves raw strands that will produce unfavorable scar.

Dr. Neumeister: Would you modify your technique, in terms of the repair or the rehabilitation, if you had composite tissue injury?

Dr. Merritt: Certainly. For example, in a digit replantation, I would use a very strong multiple-strand core suture tendon repair, stabilize the bone as best possible, and initiate early motion. Whereas if I have a clean, sharp tendon laceration in a child, not involving bone, I would repair the tendon and immobilize the child for 3 weeks.

A NUMBER OF HAND SURGEONS ARE FANS OF RESECTING THE FDS TO IMPROVE GLIDE OR DIMINISH THE VOLUME WITHIN THE FIBRO-OSSEOUS CANAL, AND THEREBY IMPROVE THE OVERALL OUTCOME.

MICHAEL NEUMEISTER, MD

Dr. Neumeister: Don, a 23-year-old patient presents to the emergency room with a zone 2 flexor tendon laceration. It is 10 o'clock at night and you get the call from your resident or from the emergency room physician who tells you what's injured. What's the proper timing for the flexor tendon repair?

Dr. Lalonde: That exact scenario happened to me last Wednesday evening. I was called by the emergency room because a young man had just lacerated his flexor tendon. I asked the emergency room physician to close the skin and send the patient to my next clinic, which happened to be the next morning.

continued

HAND TABLE

continued from page 12

We have 3 hand clinics a week here in my city, and so people are always seen with a flexor tendon injury within 2 or 3 days. I see absolutely no reason to do these acutely in the middle of the night. There's no evidence that that's useful. It is more important to do these during the day when everyone is well rested. I love to do my flexor tendons with my therapists in attendance because we do these repairs as a team. Of course we don't do these in the main operating room anymore, I haven't done flexor tendon repairs in a main operating room most of the time now for the last 8 years unless it's part of a mangled hand or a replant.

Dr. Neumeister: Would you ever repair the tendons in the emergency room?

Dr. Lalonde: I would do them in the emergency department, but I would prefer to do them in the clinic because in the emergency department – once again, especially if it's at night or in the weekend I don't have the advantage of doing a flexor tendon repair with my therapist in attendance. I've come to believe that it's very important to actually do the tendon repair with your therapist there because you and the therapist can discuss what kind of laceration it was, whether the vincula are intact, whether the tendon repair is shredded, so you know if you have a good blood supply or whether it's going to glide well. And both the therapist and I have the opportunity to assess the psyche of the patient—which is extremely important. If we have someone with a high non compliance factor we're not going to be doing early active mobilization. And if I have a full hour and a half with my therapist to teach the patient while I'm doing the flexor tendon repair, we get a very good idea for what kind of patient this is, and what kind of post-operative therapy we're going to institute so that we're going to get a good outcome.

Dr. Neumeister: Amanda, you are in attendance while he's doing the tendon repair, and you're talking to the patients and seeing exactly what he's doing surgically. Have you changed how you would rehabilitate these patients post-operatively based on what you witnessed during the repair?

Ms. Higgins: I am able to sit in on flexor tendon injuries that are being repaired using the wide awake approach in the plastic surgery clinic. Yes, I believe this has an impact on how I treat patients post-operatively. Actually, treatment time begins during the surgery in these cases. I am able to teach the patient about their own anatomy, and what a tendon is. The patient is able to see for themselves what a tendon looks like, what the repair looks like, how the tendon moves or glides. The patient can appreciate why it is necessary to protect the tendon repair with a splint and to avoid certain wrist and finger positions. As I am educating the patient I can get a "feel" for the person. Is this person listening to instructions? Does the patient understand the significance of the injury? Will the patient be likely to follow therapeutic recommendations or are they going to continue to play hockey throughout the healing process? I am able to see for myself what the repair looks like and how the tendon glides within the pulleys and sheath immediately after repair. The surgeon and I can discuss the repair, discuss the patient's ambitions and together we decide how to start the therapy program. From that point onward I decide how the program will continue on a patient by patient basis. I mix and match protocols. When I first started working in hand therapy all patients followed the same protocol; the one that I was taught. Now I change the therapy program based on how the patient is responding to the program and how the patient is responding to the information given to them. If they're doing too well too soon, then I change the program appropriately. If they are not doing well, I need to add to the program.

Dr. Neumeister: So it sounds like the team approach is important in its ability to modify the post-operative regimen of therapy based on each individual patient's intra-operative findings, and the patient's expectations.

Dr. Lalonde: I would like to emphasize something that Amanda said about the individualization of treatment. I think it is key that everyone understands that a single protocol is something from which the knowledgeable therapist needs to be readily willing to depart. For example, if you have a patient who at 3 weeks, regardless of your post-operative management protocol, has full active range of motion, that's a patient that you need to protect as he is likely to rupture. The patient who has interphalangeal stiffness then needs a very vigorous protocol, needs to be pulling as hard as possible, and needs to remodel the joint capsule. The whole difficulty is that patients are not all alike, and they don't heal alike. The variables such as age and the nature of the injury we can understand, but there's a tremendous spectrum of individual responses that are unrelated to age and the nature of the injury and the therapist. The knowledgeable therapist has to be willing to modify the protocol to fit that patient, not make the patient fit the protocol.

I SEE ABSOLUTELY NO REASON TO DO THESE ACUTELY IN THE MIDDLE OF THE NIGHT.

DON LALONDE, MD

Dr. Neumeister: I think that's a great point, and thanks for emphasizing that. I don't have my therapist in the operating theater when I'm doing the repair, but a lot of times

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HAND TABLE

continued from page 13

they will walk across the hall to my clinic to ask questions and clarify points of treatment. So I can certainly see the merit in the way Don and Amanda have worked their clinic.

Wyndell, what is your idea of the proper timing for flexor tendon repair?

Dr. Merritt: Well, classically, there's no good data to say that there is any adverse result within 10 days. Personally, I suspect that there is, but it is hard to measure because of multiple variables. In our extensor tendon repair study, we found a significant adverse difference after 48 hours using a grading technique that compared the repaired finger total active motion of the normal side to the repaired digit. As a consequence, I strongly suspect that the earlier the repair, the better for flexor tendons as well. I agree with Don that there's enough disadvantage to repair in the middle of the night without an optimal team that it doesn't warrant emergency immediate repair. But I do believe that sooner is typically better, certainly within days and not weeks.

Dr. Neumeister: Okay, let me ask this question then – so how late is too late? They present to the emergency room, 10 days out, 2 weeks out, 6 weeks out? What is too late?

Dr. Merritt: Well, this varies with the patient. For example, if you have an avulsion injury of the profundus and the tendon is stuck, let's say at the DIP level, and therefore sheath does not contract and close, John Packer described repairing this as late as 6 weeks with good result. But a much earlier injury, say after 2 or 3 weeks, may have inflammation and collapse of that tunnel, and you're stuck with a poor result if you do a delayed repair. So I think it must be individualized. If you see a patient 1-2 weeks after injury with a stiff, swollen, inflamed digit that is painful, that's not a candidate for a repair. You must recover passive motion and reduce inflammation preoperatively, and you may well need to plan a two- stage tendon graft by the time you achieve this. When you see a patient even two or three weeks after injury with an unswollen, uninflamed hand that has normal passive range of motion, you may find a tendon sitting there in the sheath and can do a successful delayed primary repair, even that late. I have had a good result after three weeks in an elderly patient, but the patient must be warned that the exploration may prove to be a first-stage tendon graft.

Dr. Neumeister: Don, do you agree with this?

Dr. Lalonde: I agree with everything Wyndell says. I would add that a lot of people forget to do a simple physical examination of the finger. You can often tell that the profundus has retracted into the palm as the flexor sheath feels empty on palpation. If the profundus tendon is retracted far away, more than 3 or 4 centimeters, and if the injury is more than 3 weeks old, then the sheath will often be scarred down and it may be very difficult to salvage that patient. That's why a lot of people talk about a 3 week window- if it's more than 3 weeks it's too late, because at that time the muscle has shortened irretrievably and you can't stretch it out.

With a zone 1 injury, though. if the tendon is palpable in the sheath, the vinculae may have held the tendon out to length which means that the tendon can be repaired even beyond 4 weeks.

Dr. Neumeister: Okay. I want to come back to specifically zone 2 lacerations at this point. Don alluded to the fact that he doesn't do these in the main OR anymore. Many hand surgeons still believe that flexor tendon repairs should be done in the main operating room, and I'd like Don to explain the term "wide awake surgery" and why would it necessarily be better for the common every day hand surgeon to take on this approach?

Dr. Lalonde: Wide awake flexor tendon repair is all about no tourniquet, no sedation and no general anesthesia. You don't need a tourniquet because you're using epinephrine with the lidocaine for hemostasis in the finger, which has now been shown to be quite safe. Particularly if the surgeon understands the use of phentolamine to reverse vasoconstriction in a finger, if ever it need be. It's a little bit like Naloxone is to morphine, phentolamene reverses epinephrine vasoconstriction reliably in 1.5 hours.1 A level 1 study of 3,110 epinephrine injected patients showed that not one needed phentolamine.[2] The whole myth of you can't use epinephrine in a finger is false.[3] With epinephrine vasoconstriction there's very little bleeding, so you don't need a tourniquet. And because you don't need a tourniquet, you don't need general anesthesia or sedation.

I AM ABLE TO SEE FOR MYSELF WHAT THE REPAIR LOOKS LIKE AND HOW THE TENDON GLIDES WITHIN THE PULLEYS AND SHEATH IMMEDIATELY AFTER REPAIR.

AMANDA HIGGINS, OT REG(NB) BSC, OT

Wide awake flexor tendon repair is all about a patient going to have his flexor tendon repair like he goes to the dentist. The surgeon injects lidocaine with epinephrine tumescently, every-

continued

1. Nodwell T, Lalonde DH.: How long does it take phentolamine to reverse adrenaline-induced vasoconstriction in the finger and hand? A prospective randomized blinded study: The Dalhousie project experimental phase. Can J Plast Surg, 11(4):187,2003.]
2. Lalonde DH, Bell M, Benoit P, et al: A Multicenter Prospective Study of 3,110 Consecutive Cases of Elective Epinephrine Use in the Fingers and Hand: the Dalhousie Project Clinical Phase: J Hand Surg, 30(5):1061,2005.
3. Thomson CJ, Lalonde DH, Denkler KA, et al: A Critical Look at the Evidence for and against Elective Epinephrine Use in the Finger. Plas Reconstr Surg, 119(1):260,2007.

HAND TABLE

continued from page 14

where that there's going to be an incision. You wait 15–20 minutes for the epinephrine to work while you prep and drape and prepare the patient and so on. Epinephrine vasoconstriction lasts up to 5 hours on average in human fingers

When we make incisions, there is often some bleeding in the beginning, but most hand surgeons operate on other parts of the body and red cells don't generate anaphylactic reactions in most surgeons. And after the skin flaps are cut and sewn back, almost all of the bleeding is stopped. We don't use cautery, you don't need it, it will all stop by itself. By the time you get the flexor sheaths exposed, then there's very little bleeding.

There are 4 advantages to doing wide awake flexor tendon repair. Firstly, we believe that it's decreasing our rupture rate. After you put in your first core suture, you get the patient to actively flex the tendon. With active flexion of the tendon, the suture will sometimes bunch in the tendon because that's the nature of putting a thread in a rope; it's not always as tight as it can be. And when the suture bunches in the tendon you get a gap, and we all know that gap leads to rupture. But if you see a gap occur with active movement during your repair, you can repair that gap before you close the skin. And so the gap doesn't appear at 3 weeks after the patients' doing active movement and then leads to rupture. So decrease in rupture rate is #1.

The second reason that wide awake repair is better is that when you get the patient who's comfortable, cooperative and in no pain to actively flex the repair during the surgery, you will sometimes see triggering of the repair, or the repair won't fit through the sheath. And if the patient can't actively flex now, they're certainly not going to actively flex at 3 weeks, or at 3 months or at 6 months. You can solve triggering problems during the repair surgery, by adding extra sutures in the repair to make it smaller to fit through pulley's, or you can divide pulleys.

The third reason is that with wide awake flexor tendon repair you can do more pulley preservation. In other words, instead of cutting a pulley so that I can see the whole tendon to get 1cm of suture purchase, I can make small transverse incisions in the flexor tendon sheath, through which I can put my needle to go through the tendon repair underneath intact pulleys and sheath. I can only get away with that because I can see the patient actively flex the finger and I know that my suture has not been caught either in the pulley or in the floor of the flexor tendon sheath.

The fourth and final reason that I prefer wide awake flexor tendon repair in addition to no nausea, no vomiting, no unnecessary admission to the patients and so on, and all the other things that are associated with general anesthesia – is one that we've alluded to earlier which is that my therapist and I can assess and teach a patient for a full uninterrupted hour and a half and decide what kind of post-operative regime we need to use. We can actually teach the patient the post-operative hand therapy regime during the surgery so that the patient knows what to do later.

Dr. Neumeister: Wyndell, would you agree with the wide-awake approach? Certainly it's a deviation from the way that you were trained and perhaps the way you may do it now?

Dr. Merritt: I agree that the wide awake approach is probably the best approach in most patients. I don't have the luxury of a clinical setting like Don, so I use the operating room for my repairs. The alternative is the emergency room, which is the 2nd dirtiest place in the hospital (radiology being the worst). Currently, we are seeing a high percentage of people presenting to emergency rooms with MRSA cultured from their bodies, even people who've never been hospitalized before. So given the choice of performing surgery in the emergency room or the operating room, I choose the operating room. After an embarrassing degree of difficulty, Don finally convinced me years ago that using epinephrine and no tourniquet was the best method of flexor tendon repair, and I absolutely subscribe to it. I'm not sure that I fully accept all of his reasons. There seems some question about how much gap really is important, and might lead to rupture. There's also the probability that a great deal of remodeling takes place to provide gliding that is unrelated to technique. But I absolutely agree there is nothing as convincing to the patient and the surgeon as looking at that hand flex and extend in the operating room and have them recognize that they have the potential to recover full flexion, and that you have technically achieved your goal. That gives an enormous amount of encouragement, and it also provides insight regarding how to manage the patient.

IF IT'S EVIDENT I'M GOING TO HAVE A BOW-STRINGING PROBLEM I WILL PROCEED WITH A PULLEY RECONSTRUCTION AND USUALLY I PREFER EXTENSOR RETINACULUM.

WYNDELL MERRITT, MD

Now that's not for all patients, because there are non-Canadian patients in my area who cannot tolerate this being done – who have what Don calls "the turkey factor." Now I resent that designation, as someone very enamored of the Meleagris gallopavo silvestris, the Eastern American Wild Turkey. However, I understand exactly what Don means about patients you must immobilize because they're so noncompliant, as I would expect of a domestic turkey! When you've finished the wide awake repair you have no question about

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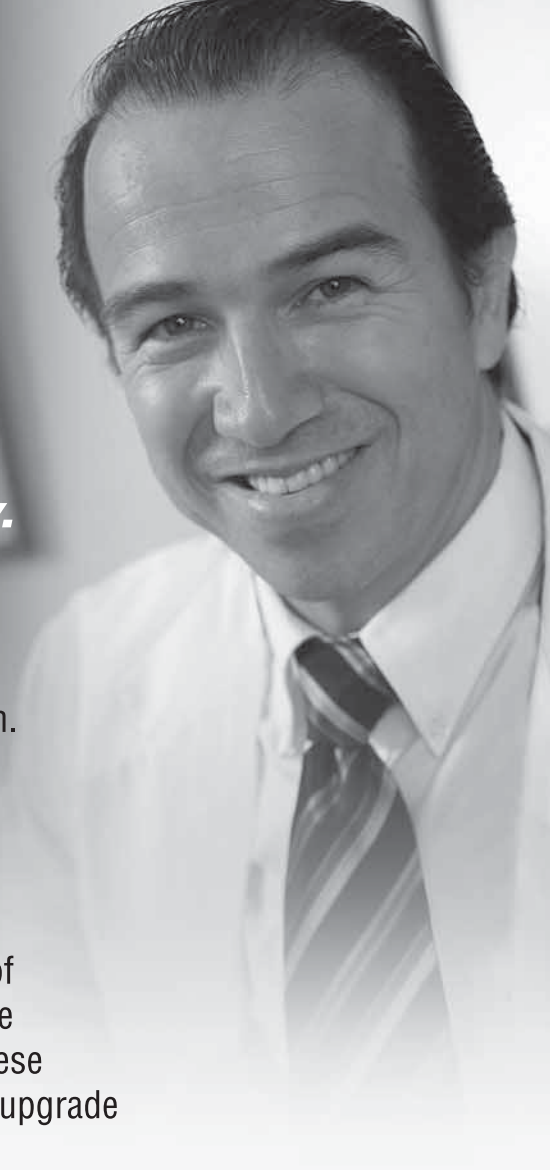

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continued from page 15

whether the tendon will glide through the pulley, have laxity, or whether you've made it too tight, and I think that's invaluable. I do give brief sedation when I initially place the anesthetic, because, in my area, in the operating room the patient expects it. Once the Marcaine with epinephrine has been placed, the patient is allowed to wake up completely, with repair done as Don has described. I suspect from your comment, Don, that you use a Bruner incision, I usually prefer a mid lateral approach, although I wouldn't argue about either.

Another thing that I would like to emphasize, Mike, is the concept of the hand being an organ, because I think this is the key biological issue in using early mobilization or any other method of management. The difficulty following flexor and extensor tendon repair is usually not the tendon, but is due to changes in adjacent, not directly injured, structures, like the volar plate, dorsal capsule and the collateral ligaments. There is a popular misconception that dense connective tissue, such as fascia, joint capsule and ligament, is biologically inert and inactive. This misconception results in surgeons having false confidence when these structures are not directly injured they can be expected to remain inactive and maintain their motion and function after being placed at rest for several weeks. In fact, nothing could be further from the truth. Injured dense connective tissue actually has a greater acceleration of collagen synthesis than skin wounds, and continues with accelerated collagen turnover for months after injury, long after skin injury has decreased its rate of activity. Activated macrophages attracted to the wound do not discriminate between the uninjured volar plate and innocent collateral ligament and adjacent joint capsule, and will undergo fibroplasia and remodeling at sites even distant from the site of injury, but particularly nearby, creating loss of function. That is why Peacock developed the "one wound / one scar" theory, and the point I would like to make is that the hand is an organ – you don't just hurt part of it. Therefore, the goal of repair includes preserving the parts that are not directly injured, often by passive motion with dynamic splinting or controlled active motion, or any other variety of techniques.

Dr. Neumeister: I wanted to emphasize maybe one thing that may be a point of controversy or a slight dissention between the two of you, and it's that concept of gap formation. Don, would you accept any gap formation in your wide awake approach?

Dr. Lalonde: I just need to make one point if I could, Mike, just back on the previous thing. The wide awake approach does not necessarily mean that you don't have a totally sterile environment. Field sterility and main operating rooms sterility is a totally different concept than the wide awake approach to flexor tendon repair. You can have total full operating room sterility with the wide awake approach, but you do have to delete your anesthesiologist and sedation. I prefer to not have any sedation at all because then the patient is not totally remembering everything in terms of education, and he's not totally helpful and reliable. With some anesthesiologists, sedation means that patients are totally uncooperative.

Would I accept any gap? The answer to that is in an extensor tendon I would certainly accept gap and I don't really understand why it is that extensor tendons can be so different than flexor tendons – but all of us have gaps in mallet fingers all the time and yet they do just fine. In flexor tendons I would not accept any gap. I've actually seen gap formation occur during wide awake flexor tendon repair. What happens is the finger moves extremely well, but the tendon is apart. I think that may be what we're seeing in the patient who is doing well at 3 weeks because he's going to rupture. I think that patient may already have a gap and the only thing that's holding on is the suture because I've seen that when I've done wide awake flexor tendon repair. The movement is awesome, the tendon is not together. And that is not going to heal together in my view. So after I put in the first core suture, I take out the needles and get the patient to do a full range of active movement. If I see no gap I'll put in my 2nd core suture and then an epitendonous suture. If I see gap after my first core suture, I'll replace that first core suture with another core suture so that I get no gap. And then I'll put in a second core suture without any gap.

Dr. Neumeister: Wyndell, will you accept any gap?

Dr. Merritt: Well, you're trying to do the Jerry Springer thing between Don and me, Mike. But I admit that in the operating room with the patient awake flexing, if I had a gap, I'd fix it, because with biological change I wouldn't know how big the gap might become later. However, there have been in vivo studies done in canines that did not show any adverse affect to a gap up to 3 mm. Beyond 3 mm it was suggested that there was a greater risk of rupture, and I think that probably is valid, at least in dogs. The reality is that once you close that wound you don't know how much gap is going to develop – so why leave any gap when you can fix it at the time of surgery? So, Don and I don't have as much disagreement as you might think.

Dr. Neumeister: Good. 3mm has certainly been quoted as being the upper limit of acceptable gap, above which the risk of rupture is too high. Wyndell, what type of repair would you do?

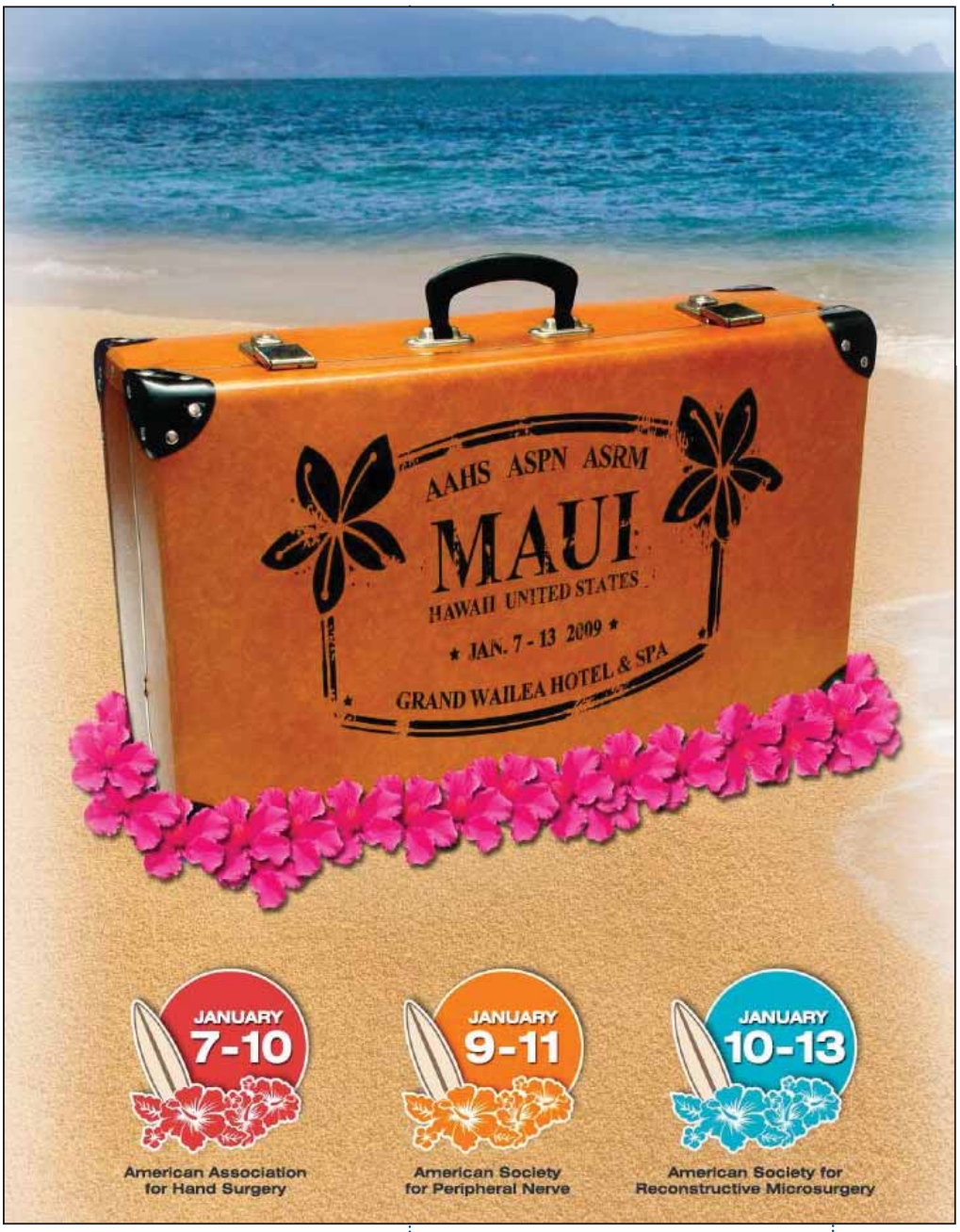
Dr. Merritt: I usually use a modified Kessler repair, then a running epitendinous suture. I know there has been an enormous number of different techniques suggested, most of which demonstrate how strong repairs can be in dead people. I really think that the strength

continued

continued from page 17

of the suture is not such a great issue unless you're using an early active motion protocol – like you might in a person with a replantation. For that reason, I like the Becker or a modified Becker technique in the patient who has a replant. Years ago, Weeks showed that the tendon was it's weakest at about 10 days after you repair it. I'm sure it didn't get weaker because the suture got weaker, it got weaker because of the biological inflammatory response. So I think those biological considerations are likely more important than mechanical ones in most patients. The epitendinous suture for example, is reputed to increase repair strength, but I don't put it in for strength, because I want this wound to heal with a favorable scar. I want that epitendinous gliding surface to be next to my "one wound / one scar" milieu that will provide opportunity for a more favorable gliding scar. I don't want raw, intra-tendinous collagen sticking into that space, creating intratendinous-type adhesions. So I really think that the type of suture and the type of surgical repair is over-emphasized, and the type of individualized management of the patient tends to be under-emphasized.

Dr. Neumeister: Well this becomes a very important point. I believe most hand surgeons still do a modified Kessler. However, every couple of months in the hand journal we'll see a different type of a multi-strand technique for repair. And you're right, most of these are cadaveric studies or animal studies. The biologic milieu may be different than what we would see in our day-to-day practices. But Amanda's going to have to answer a question here because Don has described a 4-strand repair, or 2-core sutures, and Wendell prefers the 2-strand in the regular every day zone 2 if there's no other complicating factors. So Amanda, have you seen a difference with 2-strand versus 4 strand repairs? Because I think earlier almost all of us did 2-strand repairs. And does it change what you would do post-operatively?



Ms. Higgins: I don't notice a difference between 4 strand and 2 strand repair. Generally speaking for most patients with a 4 strand repair I use an early active range of motion program as well as passive flexion / active extension of the fingers within the splint starting around day 4 or 5. I have been using the modified synergistic motion protocol by Dr. Tanaka et al (Journal of Hand Therapy 2005; 18(3): 330-338). A patient with a 2 strand repair, I tend to start off with a passive range of motion program, modified Duran approach, and then start early active ROM around week 3. For both repairs I fabricate a dorsal block splint. But I too, like Dr. Merritt, appreciate the 10 day rule in that the tendon is at its weakest at this time and I tend to ease off around the 10 day mark whether I'm doing early active range of motion or early passive range of motion program. I can't say that I have better results for one or the other.

continued

HAND TABLE

continued from page 18

Dr. Merritt: For the sake of discussion I suggest we don't have data that would prove a significant difference between the two, and I think you'll agree with me.

Ms. Higgins: That's right.

Dr. Merritt: I would suggest to you, just for the sake of the Jerry Springer approach, that the patients with a 4-strand of non-biological suture repair have twice as weak a tendon at 10 days than the patients who only have two strands because of twice as much foreign body reaction. Now I'll admit that nobody's ever shown that, but for the sake of argument one could take that position. So while I think we don't have good data in that respect, it is important to have a strong repair when early active motion is planned. In Romania, I was impressed by Professor Alexandru Georgescu's modification of the technique and suture Giorgio Brunelli developed years ago with immediate active motion in a progressive protocol, providing some rather outstanding results. So I'm not sure whether it's the suture as it is the management technique that makes a difference. Amanda, have you seen ruptures with your protocol?

Ms. Higgins: Very, very few. We don't seem to have a high rupture rate at this point.

Dr. Merritt: What does very few mean?

Ms. Higgins: About 2%.

Dr. Merritt: 2% is certainly low for an active motion protocol. I know the Becker technique was done originally in Africa in a population that really couldn't get any hand therapy. Hilton Becker developed this technique as a practical solution, and he had about a 10% rupture rate. In that setting, 90% good result was great. However, in Richmond we cannot accept a 10% rupture rate except in replantations, so any active mobilization program has to be carefully monitored.

Ms. Higgins: Yes and I agree, I don't think that there's a lot of evidence that shows a significant difference between 4 strand and 2 strand repair using specific range of motion protocols.

Dr. Neumeister: There are articles and there are clinicians who will describe a 6 or 8 strand repair – is that ludicrous?

Dr. Lalonde: I agree with Wyndell, I think you're just adding more collagen potential with the extra suture, and decreasing tendon blood supply. I think that in dead bodies it may be more powerful but in live bodies you want live tendon to heal and if there's nothing there but lots of suture, it's going to be very hard for the tendon to heal.

Dr. Neumeister: I wanted to ask a few other questions about repairing both FDS and FDP in zone 2. Don, is that still your approach? If so, what technique do you use?

Dr. Lalonde: Generally, if I can, I do. A lot of times, as you know, FDP is a good solid piece of tendon that you can put a suture in, whereas FDS, particularly if it's cut near the insertion, is a wispy little thing, especially in the small finger. The suture can be bigger than the tendon. If it's a wispy little thing, and especially if I have 1 of the 2 slips of FDS intact I won't bother to repair the other one. A certain percentage of people don't even have an FDS to the 5th finger, If I have a good solid sturdy FDS that I can get sutures in, then I will. I think that excising an FDS slip to make more room in the sheath may generate more scarring.

Dr. Neumeister: Okay. Wyndell, do you repair FDS?

Dr. Merritt: I have a similar view as Don, with the exception that I typically do not repair the FDS in the 5th digit of most patients, because the two tendons may adhere. As he pointed out, 10% of people don't even have FDS function in their 5th digit, but do rather well. However, if I had a violinist or someone who especially needed independent function of the 5th digit, and the tendon wasn't a wisp as Don described, I would repair it. Typically, if only one strand of ten-

continued

continued from page 19

don is divided I leave it alone. I share Don's view on that, because I think the suture material is a nidus of inflammatory response, and therefore a nidus for adherence, so I simply trim the slip of the sublimis that was cut and leave the intact side alone because it works just fine with just one.

Dr. Neumeister: A number of hand surgeons are fans of resecting the FDS to improve glide or diminish the volume within the fibro-osseuos canal, and thereby improve the overall outcome. Amanda, does it change your therapy if the FDS was not repaired?

Ms. Higgins: No, I have the same therapy program regardless if the FDS is repaired or not.

Dr. Neumeister: And just to clarify from both surgeons—what's the caliber of suture and what is the suture material that you use, Don?

Dr. Lalonde: I use a 3.0 Mersilene, which is braided polyester. If I have a large tendon, and I'll often use that for my first core suture and then a 4.0 Mersilene for my second core suture, depending again on the size of the tendon. If I have a small tendon, I just use straight 4.0's. I know that there's some evidence that 3.0 may be better. I think the main thing is that at the end of the procedure, if I get a nice good active range of motion by the patient and the tendon is solid and I don't have a gap, I know that whatever I put in there is good enough.

Dr. Neumeister: Wyndell?

Dr. Merritt: I use 4-0 Prolene for my core suture and I run a 6-0 Prolene for my epitendinous suture. I sometimes use smaller sutures for a sublimis slip, and may use a simple technique depending on what I have to work with. I would point out that Dr. Peacock used to love to shock audiences, claiming that he used 4.0 silk in all of his flexor tendons just to emphasize the fact that he didn't think it made any difference what type suture you used. Years ago I used a wire suture to see if the tendon was gliding on dynamic fluoroscopy, and I really didn't notice any adverse result, although some animal studies suggested that wire could cause some edge necrosis.

Dr. Neumeister: Well, there are some recent articles that suggest we should perhaps use spider wire or gorilla wire. Wire that is extremely strong so that a smaller caliber can be used. Would you agree with these recent articles?

Dr. Merritt: I would adhere to the old concept I was taught, that the type of suture doesn't make any difference if you can hold the tendon where you want it during the interval of healing. That's probably one of those irrelevant issues that we make a big fuss over, unless an immediate active motion protocol is considered. It was interesting that the study that I did at Emory with wire tendon repairs under fluoroscopy showed no gliding using a dynamic rubber band Kleinert or Duran passive motion technique in many of the patients. And although many times you could not see initial tendon glide, later you could see motion as it begin to actively glide, so the fact the finger was flexed and extended passively didn't necessarily mean that the tendon moved. But when the patient was getting good active motion it certainly did visibly glide radiographically.

Dr. Neumeister: Are there any contraindications to performing flexor tending repair? Don?

Dr. Lalonde: That's a very good question. I think that one of the areas that I struggle with as my hair gets whiter is whether or not I should do an isolated profundus repair when someone has an excellent functioning superficialis finger. Particularly when they're a late repair. In other words, should I do a staged, 2 stage flexor tendon grafting procedure or should I recommend that they live with a superficialis finger? And I must admit that it might be that I'm just not that good at 2 stage flexor tendon repairs, but in the ones that I

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American Association for Hand Surgery Calendar

For information contact:
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2008

October 23–26, 2008
ASHT Annual Meeting
Boston, MA

Oct. 31–Nov. 5, 2008
ASPS Annual Meeting
Chicago, IL

2009

January 7–10, 2009
39th Annual Meeting
Grand Wailea Resort
Wailea, Maui, HI

Feb. 25–Mar. 1, 2009
AAOS Annual Meeting
Las Vegas, NV

September 2–5, 2009
ASSH & ASHT
Combined Annual
Meeting
San Francisco, CA

October 7-9, 2010
ASSH Annual
Meeting
Boston, MA

October 23–29, 2009
ASPS Annual Meeting
Seattle, WA

2010

January 6–9, 2010
40th Annual Meeting
Boca Raton Resort &
Beach Club
Boca Raton, FL

October 1–6, 2010
ASPS Annual Meeting
Toronto, Canada

2011

January 12–15, 2011
41st Annual Meeting
Ritz Carlton Cancun
Cancun, Mexico

September 23–28, 2011
ASPS Annual
Meeting
Denver, CO

HAND TABLE

continued from page 20

have done I have downgraded some fingers. And if I had just left them alone and let them live with a superficialis finger I might have done those patients a better service. When I see patients who come in with an excellent superficialis finger and they come in late, as in 3 months after a pure profundus laceration, I'm very careful about jumping into a staged flexor tendon repair. I really take a good history and have a good discussion with them about the risks and benefits of the alternatives of treatment. Unless the situation is ideal, I often give those patients the option of just living the way they are and passing on a year or two of therapy and multiple operations and perhaps a more stiff finger than what they have now.

Dr. Neumeister: And Wyndell?

Dr. Merritt: Now that my hair is profoundly white, I fully agree with Don. I think the key is to individualize, and you must do it with open conversation with the patient so there is a clear understanding of the morbidity of a two-stage tendon graft procedure, with possible adverse result and potential decrease in motion. Certain variables are well known, such as whether the finger is inflamed, the nature of the injury and age of the patient. Others are less obvious, such as motivation, compliance and individual healing response. For somebody who does not want immobilization and is unwilling to invest in a prolonged therapy program, I think the patient would better off and would choose to have tenodesis of the DIP joint, or a fusion, especially in the middleaged or older patient. On the other hand, young patients and patients with supple hands, and patients who have precise activities they wish to do, such as a musician, will prefer to gamble on the maximum potential benefit of a two-stage tendon graft procedure. I have always loved doing tendon grafts, though it seems rarely called for nowadays.

Dr. Neumeister: And so to all 3 of you, how do you define a good result or outcome?

Ms. Higgins: Well, I look at 3 things to determine a good outcome. First of all, I like to see functional return. If patients are reporting that they have returned to all their previous functional occupations then that certainly for me is a great outcome. I also like to compare total active range of motion measurements of the affected finger with the unaffected finger of the opposite hand. I like these measurements to be as close as possible, but I don't have a percentage to compare it to. Finally I look at pad to palm measurements; I like to see the MCP joints at least around the 75-90 degree flexion, the PIP joints around 80-100 degree flexion, and the DIP joints somewhere between 35 – 45 degrees at least.

Dr. Neumeister: Okay. Don, your point of view?

Dr. Lalonde: I think that if a patient can make a good fist that's a good outcome because generally if they can make a good fist and extend most of the way, they can do most of the activities of life. I think the PIP joint is probably the key. DIP movement is less important, if somebody has excellent PIP movement and good MP movement then can make pretty much a full fist even if their DIP is relatively stiff. People with DIP fusions have very functional hands. So if they have good PIP movement and good MP movement and they can extend enough to get around a good Canadian beer bottle they're probably doing pretty well.

Dr. Neumeister: They could probably do that without their hands though. Wyndell, what's a good outcome for you?

Dr. Merritt: I'd like to reiterate Amanda's recommendation to compare the range of motion to the uninjured hand. When we studied extensor tendons we found enormous variation among the normal active range of motion in different patients, even at the same age. So if you take arbitrary numbers to classify good, fair, poor, I think the result can be confusing. If you say percentage total active motion of the other uninjured finger, I think that's a more accurate measurement. When repairing a tendon in the awake patient, like Don, I would accept some flexion contracture in the DIP joint, if needed, to provide full flexion and full extension of the PIP and MP joints, especially in the 4th and 5th digits, which can occur if the tendon had to be shortened. In the index digit I prefer full extension.

Dr. Neumeister: Good. Well I have a few more questions and I promise to make these quick for everyone. So, Don when would you perform a tenolysis, what are your indications to do that?

Dr. Lalonde: If there's been no improvement in the numbers in terms of flexion and extension for 6 months, and if there's a functional impairment by the fact that there has been no improvement.

Dr. Neumeister: Okay, Wyndell?

Dr. Merritt: I would add that I like to see full passive pain-free range of motion before surgery and then I would choose to do tenolysis in the wide awake fashion to match the active to the passive range of motion intraoperatively. Never expect any range of motion after tenolysis than you can't achieve passively prior to surgery.

Dr. Lalonde: Gee, I wish I'd thought of saying that.

Dr. Merritt: Don, there is something I meant to ask you earlier. Since I have adopted your "wide awake" epinephrine use I have never had to reverse anybody with phentolamine. Now that you've done thousands for many years, have you ever had to reverse the epinephrine effect?

Dr. Lalonde: The answer to that is I have never had to use phentolamine in anybody, but there is one patient that I could have and maybe should have. This was a woman on whom I did a Dupuytren's finger, and much to my amazement she

continued

continued from page 21

had a persistent blueness of her finger, even when I saw her the next morning. However, she recovered just fine and everything settled down just fine, but afterwards I thought that maybe that's one that I should have injected with phentolamine. I have been doing 95% of all of my hand surgery for the last 8 years with the wide awake approach with epinephrine in fingers, and like the many other Canadian surgeons now using this technique, I am not worried about epinephrine in the finger.

Dr. Merritt: In my practice, I do not use epinephrine for Dupuytren's surgery, because so often when I correct a fixed PIP flexion contracture with capsulotomy and temporary K-wire fixation they look cyanotic for a while, and I am fearful that the epinephrine might kill the flaps. In other words, I won't know if the problem is stretch of the digital vessels or vasoconstriction, so I don't use it in Dupuytren's, and I don't use it in surgery for Raynaud's patients, of which I seem to have an inordinate number.

Dr. Neumeister: That's a good point. This whole portion of the dialogue as we get the review of these questions we should insert that back to our dialogue about the wide awake and the epinephrine.

Dr. Merritt: I think it would be a good idea, Mike, because I think both Don and I agree that these are probably contraindications.

Dr. Neumeister: Sure.

Dr. Lalonde: And everybody wants to know. That was a good question, Wyndell.

Dr. Neumeister: I have a couple other questions. A patient sustains a rupture of the repaired tendon. What do you do with that? Wyndell?

Dr. Merritt: I would explore the immediate rupture patient and individualize the management. For example, if it's an older person with an intact sublimis I might do a tenodesis of the DIP joint. Or, in a younger patient I might re-repair the tendon if I understand the cause of rupture, such as failure of proper splinting or a single-force flexion episode that I don't think will be repeated. I remember one who ruptured the repair at night during a nightmare, and I successfully re-repaired. Insofar as a late rupture after tenolysis, I would typically expect to do a two-stage tendon graft if I thought the patient was a candidate, and I would place a Silastic rod at the time of exploration

Dr. Neumeister: Okay. Don?

Dr. Lalonde: I have had very few ruptures since I have started doing the wide awake technique. I were faced with an acute rupture, like Wyndell, it would depend on the patient. If I had a patient who just had bad luck and had some kind of an accident or I had made some kind of a technical error then I would do it again. If I had a patient who ruptured because they did something totally inappropriate and they were likely to repeat their performance, then I would not re-repair it. They would probably just have to live with what they have. In the late rupture after a tenolysis, I think I really would have to individualize that. I can't remember ever having one of those so I can't answer that with any form of experience.

Dr. Merritt: I had that happen in a hand re-planted at the mid-palm level with adherence, and I did a tenolysis on his flexors, and dripped a little steroid there, which seemed like a good idea to me at the time. He ruptured, probably because he needed the adhesions for nourishment of the tendon, or possibly due to the steroids, and I had to do a two-stage tendon graft. He was a young man who was a professional fly fisherman, and did rather well. He actually later made me a bamboo rod I still treasure.

Dr. Neumeister: Well that brings me to one of my last questions—not about the bamboo rod but sprinkling chemicals on the repair. Is anyone aware of any drugs or chemicals that can be used to diminish adhesion formation and / or improved overall functional outcome? Don?

Dr. Lalonde: I am not.

Dr. Neumeister: Wyndell?

Dr. Merritt: There are many reports of measures that seemed beneficial in the animal model, but I can't say I've been convinced that in the human repair there's been any convincing advance. At one time I did a research project on using streptokinase to lyse fibrous strands that would become adhesions. Unfortunately, all I found out was that chicken blood fibrin is not lysed by streptokinase, after I had assassinated a number of chickens! However, there has been encouraging research, some of it in Mississippi, which leads me to continue to hope for helpful adjunctive pharmacologic agents.

Dr. Neumeister: I think there's a lot of independent variables in tendon healing. There are many possible ways to manipulate cell migration, growth factor proliferation, or gene regulation. The future may hold many opportunities to alter any of these factors to promote strength yet minimize friction and adhesions

Dr. Merritt: From a practical point of view, any agent you use to reduce the inflammatory response reduces wound healing strength of the tendon. There was once a great debate about whether tendons healed by adhesions or intrinsic nourishment, and now know both are true. However, it is not always predictable whether a specific tendon would heal predominantly extrinsically or intrinsically. For example, if you have a tendon that has ruptured all the vincula, I think it's naïve to expect that tendon is going to heal without adherence, because it's suffering from a lack of intrinsic blood supply and the

continued

continued from page 22

ischemic tendon will attract adhesions. So I agree with you, Mike, that these factors are too variable to develop an animal model that's convincingly applicable to humans. One would expect that the first beneficial agent will be in patients with tenolysis rather than tendon repair, because in the intact tendon you could cut adhesions and use measures that would prevent re-adherence in a less risky fashion, but it hasn't been convincingly accomplished yet.

Dr. Neumeister: Well, I think this has been a very good discussion. Amanda, Don, or Wyndell do you have anything more to add or something we should discuss that we haven't covered? We haven't gone into staged reconstruction and timing of that, but I think it might be beyond the scope of what this narrative is about.

Dr. Merritt: We didn't talk much about pulley reconstruction…

Dr. Neumeister: Oh, there is one question with that. If you see that the pulley is destroyed at the primary repair, what do you do? Or if you're in there during a tenolysis how do you reconstruct a pulley?

Dr. Merritt: Well, if it's evident I'm going to have a bow-stringing problem I will proceed with a pulley reconstruction and usually I prefer extensor retinaculum, placing the gliding surface against the tendon. However, at times I've also had to use tendon graft. Most of the pulley reconstructions I have done have been in patients during the first stage of a two-stage tendon graft reconstruction, and sometimes a lot of graft is needed. The key point in post-operative management is to have a ring-type splint to protect reconstructed pulleys from pulling loose from their moorings whenever you're mobilizing the patient.

Dr. Neumeister: So do you concur that you should go underneath the extensor mechanism for A2 and over top of it for A4?

Dr. Merritt: I really don't know Mike, but that would seem like a practical solution to me.

Dr. Neumeister: Wyndell, you have written about RSD. Any thoughts you would like to share?

Dr. Merritt: One procedure many people have forgotten was by Leonard Furlow years ago, taking the intact tendon sheath, pulley mechanism and both tendons transplanted from cadavers with very successful results, using no anti-rejection medication. The practical reason it never got adopted in this country was the problem of paying for the operation on the dead person. The logistics of Silastic rods was much simpler. The fact we don't see very many two-stage tendon grafts anymore is a good indication that we have a better group of surgeons today.

Dr. Neumeister: What are the latest advancements in flexor tendon surgery and where do you see flexor tendon repairs 50 years from now?

Dr. Merritt: My career has spanned such a long time that I can recall a period in which I had to fight to advocate hand therapy, while in our current time it is taken for granted. You would not remember it, but at one time in the Hand Association there was a significant opposition to any participation of hand therapists. When Gary Brody was president, he tapped me to try and change that attitude. It took a while, but the therapists themselves convinced everybody, and became leaders. What I see today are wise young hand surgeons already with a concept of the need to manage the patient post-operatively in concert with the hand therapist. What I think has been the greatest advance, as far as I am concerned, is not the suture material and not even the significant advance of wide awake surgery, but the recognition that therapy must be individualized for the individual patient. We now deal with knowledgeable hand therapists who are willing to modify management according to the needs of the particular patient. For example, the patient with full active range of motion at three weeks needs to be protected from rupture, while the patient with stiff interphalangeal joints at three weeks needs dynamic splinting, and to try to flex as hard as possible. In other words, as Don previously stated, the therapists don't try to fit the patient to the protocol, but examine the patient, measure the patient, and then either give the encouragement to continue an improving program or change the program of therapy if there is no improvement. In the future, one hopes we will develop pharmacologic agents that will promote gliding, but for the present, I don't think we have as many knowledgeable hand therapists as we need, and I expect their management techniques will continue to improve, and may prove a more significant factor than our technical techniques.

Dr. Neumeister: That's great. Don what do you think the current advances? We discussed wide awake surgery and I think we all agree that that is certainly one of the advances. Others?

Dr. Lalonde: I think that Wyndell is quite correct about individualization and proper use of hand therapy. I think that more and more people will use the wide awake flexor tendon repair as they get more comfortable with pure local anesthesia in the hand, and they see the benefits of active movement during the repair with their own eyes.. And I do think that more individualization instead of standard protocols with recipe type hand therapy is going to happen.

Dr. Neumeister: Amanda, do you agree with the surgeons about the hand therapist being a major part of the current advances in flexor tendon repairs?

Ms. Higgins: I certainly do. Another great advancement is the ease of hand therapist and hand surgeon communication. I certainly have a unique situation in that I see the

continued

HAND TABLE

continued from page 23

hand surgeons I work with on a regular basis, and not all hand therapists have that opportunity. However, regardless of the amount of contact there is, the wall between surgeon and therapist has fallen. Flexor tendon repairs are dealt with as a team effort. Therapists and surgeons are talking the same language. Therapists understand surgeon technique and surgeons are discussing treatment programs.

Dr. Lalonde: I would agree with that and I think communication and common knowledge with respect to individualized patient care are going to be what leads us to good outcomes.

Dr. Merritt: You have a situation in which when we confront an unexpected bad outcome there is temptation for the therapist to blame sloppy surgery and the surgeon may claim bad therapy. But if the surgeon and therapist communicate well they may both say it's a bad patient. Many times it's none of the three; it can certainly be an individual patient's wound healing response. If you want a good example of a bad result that's an individual intrinsic wound healing phenomenon, consider reflex sympathetic dystrophy, which can occur in anybody with a repaired flexor tendon, and the entire hand can be mottled, deossify, become stiff, swollen and inflamed throughout, possibly with neurogenic inflammation, and all the fingers becoming stiff. This has nothing to do – as far as we know – with surgical technique or hand therapy management. To a much lesser degree there can be similar results in which only the single digit becomes stiff.

Dr. Neumeister: I appreciate all the work that everyone has put forth. Amanda, Don, Wyndell, thank you H

2009 Application for Research Grants

The AAHS Research Grant Awards were established to further the purpose of the Association as stated in its Bylaws and to foster creativity and innovation in basic and/or clinical research in all areas pertinent to hand surgery.

Awards and Eligibility

Grants will be made for a one year period to up to three investigators. Grants are available to all AAHS members. One of the investigators must be an active or affiliate member of the association.

Grant Application

Applications may be obtained from the AAHS website at www.handsurgery.org, or, you can call 312-236-3307 to request a copy.

Applications (an original plus seven copies) must be received by the committee chair no later than Monday, November 3, 2008, in order for the judging to be completed in time and the recipients to be announced at the Annual Meeting.

The AAHS and the Research Committee are required by the IRS to document disbursement of grant funds. Award recipients will be required to sign a letter of acceptance and submit a progress report once each year. The AAHS must be acknowledged as the source of funding in any presentation or publication. A final report must be submitted at the completion of the study. It is expected that the results of the funded research be submitted for presentation at an Annual Meeting within two years of the receipt of the award.

Funds must be returned to the AAHS if the study is not undertaken within twelve months of the receipt of the award.

Failure to follow these guidelines will disqualify the recipient from any further grant opportunities and from presenting any papers at the AAHS Annual Meeting for a period of three years following such default.

Mail Grant Proposals to

Michael Neumeister, MD
American Association for Hand Surgery
444 E. Algonquin Road
Arlington Heights, IL 60004

Tendon Surgery in the Hand and Fingers	
26350	Repair or advancement, flexor tendon, not in zone 2; primary or secondary without free graft, each tendon
26352	As above, secondary with free graft (includes obtaining graft), each tendon
26356	Repair or advancement, flexor tendon, in zone 2; primary or secondadry without free graft, each tendon
26357	As above, secondary without free graft (includes obtaining graft), each tendon
26358	As above, secondary with free graft (includes obtaining graft), each tendon
26370	Repair or advancement or profundus tendon, with intact superficialis tendon; primary, each tendon
26372	As above; secondary with free graft (includes obtaining graft), each tendon
26373	As above, secondary without free graft (includes obtaining graft), each tendon
26390	Excision flexor tendon, with implantation of synthetic rod for delayed tendon graft, hand or finger, each rod
26392	Removal of synthetic rod and insertion of flexor tendon graft, hand or finger (includes obtaining graft), each rod
26410	Repair, extensor tendon, hand, primary or secondary; without free graft, each tendon
26412	As above, with free graft (includes obtaining graft), each tendon
26415	Excision extensor tendon, with implantation of synthetic rod for delayed tendon graft, hand or finger, each rod
26416	Removal of synthetic rod and insertion of extensor tendon graft, hand or finger (includes obtaining graft), each rod
26418	Repair, extensor tendon, finger, primary or secondary; without free graft, each tendon
26420	As above, with free graft (includes obtaining graft), each finger
26426	Repair of extensor tendon, central slip, secondary (eg. Boutonniere deformity); using local tissue(s), including lateral band(s), each finger
26428	As above, with free graft (includes obtaining graft), each finger
26432	Closed treatment of distal extensor tendon insertion, with or without percutaneous pinning (eg, mallet finger)
26433	Repair of extensor tendon, distal insertion, primary or secondary; without graft (eg, mallet finger)
26434	As above, with free graft (includes obtaining graft)
26437	Realignment of extensor tendon, hand, each tendon
26440	Tenolysis, flexor tendon; palm OR finger, each tendon
26442	As above, palm AND finger, each tendon
26445	Tenolysis, extensor tendon; palm OR finger, each tendon
26449	Tenolysis, complex, extensor tendon, finger, including forearm, each tendon
26450	Tenotomy; flexor, palm, open, each tendon

Tendon Surgery

The topic of tendon surgery is quite a broad topic; there are almost 50 tendon surgery codes just in the reconstruction category for the hand and fingers.

Rather than list all the codes in paragraph from, all of the relevant information is summarized in the table below. The key issues to finding the correct code, as always, realtes to anatomical location (finger, hand, wrist, etc.), type of tendon (flexor ot extensor), and type of procedure (repair, reconstruction with graft, tenotomy, tenolysis, etc). Note that for most procedures, obtaining a graft for the purpose of repair is included in the primary code and should not be coded separately (except where specifically noted).

LEON S. BENSON, MD

You Code It

A 25-year-old construction worker lacerates his thumb and requires primary repair of his flexor pollicis longus tendon between the IP and MCP flexor creases.

Code = 26356 H

Tendon Surgery in the Hand and Fingers (continued)	
26455	Tenotomy, flexor, finger, open, each tendon
26460	Tenotomy, extensor, hand or finger, open, each tendon
26471	Tenodesis; or proximal interphalangeal joint, each joint
26474	As above, of distal joint, each joint
26476	Lengthening of tendon, extensor, hand or finger, each tendon
26477	Shortening of tendon, extensor, hand or finger, each tendon
26478	Lengthening of tendon, flexor, hand or finger, each tendon
26479	Shortening of tendon, flexor, hand or finger, each tendon
26480	Transfer or transplant of tendon, carpometacarpal area or dorsum of hand; without free graft, each tendon
26483	As above, with free tendon graft (includes obtaining graft), each tendon
26485	Transfer or transplant of tendon, palmar; without free tendon graft, each tendon
26489	As above, with free tendon graft (includes obtaining graft), each tendon
26490	Opponensplasty; superficialis tendon transfer type, each tendon
26492	As above, tendon transfer with graft (includes obtaining graft), each tendon
26494	As above, hypothenar muscle transfer
26496	As above, other methods
26497	Transfer of tendon to restore intrinsic function; ring and small finger
26498	As above, all four fingers
26499	Correction claw finger, other methods
26500	Reconstruction of tendon pulley, each tendon; with local tissues (separate procedure)
26502	As above, with tendon or fascial graft (includes obtaining graft) (separate procedure)

AAHS Mentoring Program Volunteers

Below is a list of AAHS members who have generously offered to teach their expertise in specific areas, letting our members continue to learn the way we were taught, as residents and fellows, in the clinic and operating room with a surgical mentor. For more information, please contact the AAHS Central Office. H

NAME	EMAIL	PROCEDURE(S)
R. D. Beckenbaugh, MD	beckenbaugh.robert@mayo.edu	Technique of pyrocarbon arthroplasty of the thumb carpometacarpal; and metacarpophalangeal and PIP joints of the digits
Richard Berger, MD, PhD	berger.richard@mayo.edu	Wrist surgery
Kyle Bickel, MD	kbickel@sfhand.com	Vascularized bone graft reconstruction for carpal pathology; complex fracture management in the hand and wrist; and arthroscopic wrist ganlion excision
Allen Bishop, MD	bishop.allen@mayo.edu	Brachial plexus reconstruction; carpal vascularized bone grafts; and microvascular free tissue transfers
James Chang, MD	changhand@aol.com	Dupuytren's Contracture; thumb reconstruction; flexor tendon surgery; trapezial excision arthroplasty; and medial epicondylectomy
Kevin Chung, MD	kecchung@med.umich.edu	Rheumatoid and congenital
Tyson Cobb, MD	tycobb@mchsi.com	Endoscopic Cubital Tunnel Release
E. Gene Deune, MD	egdeune@jhmi.edu	Congenital hand anomalies; upper and lower extremity reconstruction for deficits due to trauma; cancer resecation; and neurological disorders (i.e. brachial plexus)
Scott H. Kozin, MD	SKOZIN@shrinenet.org	Pediatrics
Don Lalonde, MD	drdonlalonde@nb.aibn.com	Wide awake approach to hand surgery
W. P. Andrew Lee, MD	leewp@upmc.edu	Post traumatic hand reconstruction; mini incision carpal tunnel release
Susan Mackinnon, MD	mackinnons@wustl.edu	Ulnar nerve surgery
Nash Naam, MD	drnaam@handdocs.com	SLAC wrist reconstruction; vascularized bone graft in treating scaphoid nonunions; ulnar shortening & radial shortening; PIP & MP joint arthroplasty; LRTI; arthroscopy of the CMC joint of the thumb
Daniel J. Nagle, MD	OOGIEN@aol.com	Wrist arthroscopy; endoscopic carpal tunnel release
Michael Neumeister, MD	mneumeister@siumed.edu	Basilar joint arthroplasty; peripheral nerve decompression
Jorge Orbay, MD	jlorbay@aol.com	Wrist fractures
A. Lee Osterman, MD	loster51@bellatlantic.net	Advanced wrist arthroscopy and small joint arthroscopy. Can also mentor a topic such as DRUJ problems, or wrist fracture.
Julian J. Pribaz, MD	jpribaz@partners.org	Soft tissue reconstruction; microsurgical reconstruction; spare parts surgery and extremity reconstruction
Michael Raab, MD	mikeraab1@earthlink.net	Corrective osteotomy (volar or dorsal) of distal radius malunion with iliac crest bone grafting
Jaiyoung Ryu	jryu@adelphia.net	Wrist reconstruction; distal radius fracture; and scaphoid fracture/nonunion
David Slutsky, MD	d-slutsky@msn.com	Use of volar wrist portals for wrist arthroscopy and arthroscopic repair of dorsal radiocarpal ligament tears; nonbridging external fixation of intra-articular distal radius fractures; nerve conduction studies for hand surgeons; and comparison of NCS and PSSD for the diagnosis of CTS
William Swartz, MD	william.swartz@verizon.net	Tendon transfer and ulnar nerve
Thomas Tung, MD	tungt@wustl.edu	Brachial plexus and nerve transfers
Joseph Upton, MD	jupton3@earthlink.net	Congenital hand surgery
Elvin Zook, MD	ezook@siumed.edu	Fingertip reconstruction