ARTHRITIS OF THE HAND AND WRIST

The Basics

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Arthritis

- *Prevalence*
  - CDC Statistics
    - *"Leading Cause of Disability in the United States"*
    - *"Nearly 19 million adults say that arthritis limits their usual activities in some way"*
    - *In California 22% of adults have some arthritis*
      - Over 50% of elderly Californians have arthritis

Arthritis

- *Prevalence*
  - CDC Statistics
    - *1 in 5 Adults in the US have doctor-diagnosed arthritis*
    - *The risk of arthritis increases with age and is greater in women (estrogen believed to have protective role)*
  - 40% Americans age 45-65 have arthritis or chronic joint pain
  - European Caucasian > Asians > African Americans

Incidence

- Hand OsteoArthritis
  - *Represents the highest age-standardized total prevalence (43.3%) in terms of joint site compared to hip OA (23.9%) and knee OA (10.9%)*
  - *Defined by presence of pain, morning stiffness, tenderness and swelling of the fingers joints, diminished grip strength and psychological problems*

Arthritis

- *Costs*
  - 1997 = 86.2 BILLION dollars
  - 2003 = 128 BILLION dollars
  - 2013 = 140 BILLION dollars
    - That's $2,117 in extra medical costs per adult with arthritis. (CDC)

Arthritis

- Types of Arthritis
  - *Osteo-arthritis*
  - *Rheumatoid arthritis*
    - Women to men 3:1
    - Age of onset: 40-50
    - 1-2% of population
  - *Rheumatologic Disease*
    - Lupus
    - Scleroderma
    - Fibromyalgia

Arthritis - MD Diagnostics

- Testing
  - No blood test for osteoarthritis
    - Synovial fluid aspiration
      - *Checks for gout*
    - X-ray
      - *Looks for signs of bony deformity*

OsteoArthritis

- Is it osteoarthritis or osteoarthrosis?
- Affects hands and weight bearing joints
- Primary OA
  - *Localized or Generalized (3 or more joints)*
  - *Most common joint is DIP followed by PIP and then thumb CMC*

OsteoArthritis

- Secondary OA
  - *Local incident or systemic factor*
- Affects the joint structure
  - *Articular Cartilage*
    - Avascular and no Nerve Fibers– receives nutrition from synovial fluid
    - Joint motion provides the pumping action to get nutrients into cartilage, also assists in lymphatic function
    - High consistency of water mixed with collagen fibers, protoglycans, and ground substance
    - 4 layers of cartilage in the joint

OsteoArthritis

- *Disease Process*
  - Changes to the most superficial layer of the the cartilage with the outer edges tearing
  - Tearing releases free fragments into the joint
  - Decrease in cartilage thickness

OsteoArthritis

- Disease Process
  - *Biomechanical Chain:*
    Altered cartilage metabolism → increase in proteolytic enzymes → disruption of cartilage matrix → release of cytokines → cartilage degradation with an increase of interleukins and tumor necrosis factor (TNF)

Osteo - Disease Process

- Ability of joint to repair itself is altered in this disease
- Normal joints have a cyclic breakdown /repair process
- As the disease progresses – balance of breakdown and repair changes eventually leading to a loss of cartilage

Osteo - Disease Process

- Secondary problems: joint synovitis, osteophyte formation, increased joint fluid
- Osteophytes
- Body attempts to create greater joint surface?

Osteo - Disease Process

- Patient description of symptoms
  - *Pain after activity*
  - *15 min or less of AM stiffness*
  - *Loss of joint motion*
- Lab Test
  - *May test for ESR, RA factor, and CR protein*
  - *Should all be negative*

Osteo - Disease Process

- Hand OA as a predictor of functional limitations at all extremities
  - *Article in Annals of Rheumatic Disease*
  - *Looked at over 3000 subjects*
  - *Symptomatic Hand OA was a predictor for functional limitations such as stair climibing, rising from a chair, etc*

Osteo - Disease Process

- Radiographic OA effects pinch and grip (Arthrits and Rheumatism)
  - *OA in CMC, MCP, and Index finger most impactful*
- Hand OA and grip/pinch/function (Clinical Rheumatology)
  - 70 Subjects (all healthy postmenopausal women)
  - 50% had only DIP involvement
  - 49% DIP + PIP involvement
  - 18% had CMC involvement

Osteo - Disease Process

- Hand OA and grip/pinch/function (Clinical Rheumatology)
  - *No patients with just PIP or CMC involvement*
  - *PIP involvement was most correlated with lower grip strength (PIP +DIP was lowest)*
  - *Pinch strength lower when all 3 joints involved*
  - *Definitely causes dysfunction…does it cause disability?*

Osteo - Disease Process

- *Why OA?*
  - Environmental and genetic factors
  - Certain occupations?
  - Obesity
  - Women more than men – esp after menopause
  - Loss of estrogen?
  - Women on estrogen replacement therapy lower OA on x-ray

Osteo - Disease Process

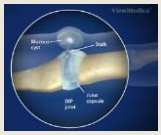
- Managing OA
  - *Improving Hand Strength (JHT 7/07)*
  - *Measured radiographic OA*
  - *Participants on structured fitness program*
  - *Reported minimal hand and finger dysfunction prior to study but did report pain*

Hand Osteo Medical Management

- MGH study looked at patients with new diagnosis OA between 2007-2011,
  - *2814 patients*
  - *60% was OA of thumb, 31% other digits, 9% thumb and digits*
  - *Average cost per patient $300-600*
  - *Higher costs when patient saw a second doctor within first year*
  - *Older patient age associated with lower costs*
  - *Men and younger patients (and those seeing a second surgery) were more likely to proceed to surgery*
  - *1:10 had injection , 1:3 were seen by OT*
  - *Widely variable based on doctor*

ARTHRITIS OF THE PIP AND DIP

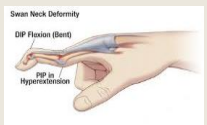
Arthritis Around the PIP and DIP joints



- *Heberden's Nodes*
  - Osteophytes around the DIP joint
- *Bouchard's Nodes*
  - Oseteophytes around the PIP joint
- *Mucoidal Cysts*
  - Soft mass on the dorsum of the joint – mostly DIP joints

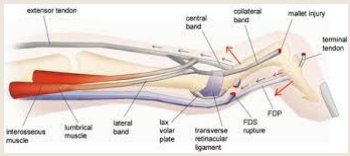
Tendon Related Changes

- *Swan Neck Deformity*
  - PIP hyperextends and DIP flexes
  - Can be caused by deformity at any finger joint
  - What at DIP joint can cause deformity?
    - Terminal Tendon
    - Where is the extensor force now?



Tendon Related Changes

- *What at the PIP joint can cause deformity*
  - Consider volar plate
  - Trauma vs. Synovitis
  - What happens to the lateral bands?
  - What is the cascade of effects on DIP?

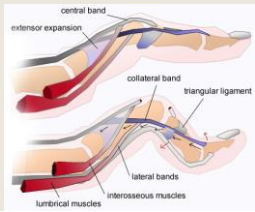


Tendon Related Changes

- *Boutonniere Deformity*
  - Flexion of the PIP and hyperextension of the DIP
    - More involved cases show hyperextension of MP
    - Begins at the PIP when central slip cannot maintain full extension
    - When would this happen?
    - What happens to the lateral bands?
    - What structures are effected in addition to lateral bands?

Tendon Related Changes

- *Boutonniere Deformity*
  - Flexion of the PIP and hyperextension of the DIP
    - Triangular Ligament
    - ORL
    - How does this effect the DIP?
    - How does it effect the MP?



Tendon Related Changes

- *Thumb Boutonniere*
  - MP joint flexion, IP joint hyperextension
  - Usually arthritic
  - MP problems
  - Dorsal joint capsule stretches out (including EPB insertion)
  - Extensor hood stretches
  - EPL goes ulnar and volar
  - IP problems
  - Volar plate attenuation/FPL rupture

Conservative Therapy

- Comfort
  - Warmth to digit
  - Digiflex
  - Neoprene Splinting
- Please straighten my finger – it's going cock-eyed!
- LLLT
- Contrast Baths

Digit Splinting for Deformity

- Pre-Made Options
  - *Silver Ring Splint vs Oval 8*

Digit Splinting for Deformity

- Custom Made Orthosis

METACARPAL-PHALANGEAL JOINT ARTHRITIS

Osteoarthritis

- *May have crepitus*
  - Especially with grind
  - Conservative treatment
    - *Heat, NSAIDS, injection*
  - Surgical Treatment
    - *Arthroplasty*

Rheumatoid Arthritis

- Typically multiple joints affected
- Ulnar drift, volar subluxation, and intrinsic tightness
- Thin bone, joint destruction
- Joint Replacement warranted in severe cases

1ST CARPOMETACARPAL OSTEOARTHRITIS

CMC OA

- *Incidence*
  - Most common form of OA in the hand.
  - Post-menopausal women with higher incidence
  - Maybe symptomatic before x-rays changes
  - May have x-ray changes before symptomatic

CMC OA

- *Incidence in hand therapist office*
  - In an ASHT survey in 2015
    - *Over half of respondents – ¼ caseload was for CMC OA*
    - *6% of therapists said CMC OA was majority of caseload*
    - *Total number of visits 1 to 3*
    - *Frequency and duration was commonly once a week for up to a month*

Mechanical changes

- Ligament laxity in beak ligament
- Joint becomes incongruous
- May develop zig zag deformity
- Cascade of problems to MP joint
- CMC joint takes 9-13X the amount of force generated at tip during pinch

Patient symptoms

- Painful pinch and grip
- Aching of thumb
- Seen by MD and given what type of splint?
- Patient may report difficulty with following
  - Opening doors/turning keys
  - Turning ignition
  - Hooking bra
  - Lifting plates
  - Writing

Differential Diagnosis

- What do you need to rule out?
  - DeQuervains
  - Crank/Grind/Finkelsteins

Videos

Conservative Treatment

- Splinting
  - CMC immobilization splint
  - Do I need to include the MP?
  - Neoprene vs. Thermoplastic
- Patient Education
  - Joint protection
  - Built up handles
  - Avoid forceful pinch
- LLLT
- Other modalities (ultrasound, LLLT, ionto)
- Injection

CMC Immobilization Splint

- Indications:
  - *Thumb CMC arthritis*
    - Alleviates pain through minimizing motion
    - Studies show most helpful in earlier stages of arthritis

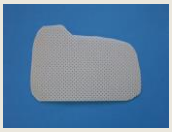
Conservative Treatment

- Splinting

CMC Immobilization Splint

- Things to Watch For:
  - *Clear wrist crease*
  - *Clear thumb IP crease*
  - *Webspace should be moderately abducted*
  - *Strapping may benefit from being weaved through*

CMC Immobilization Splint



Colditz Splint Pattern

Landmarks:
Distal Palmar Crease (both sides)
One wing from DPC & Thumb IP
One wing from CMC & Thumb IP

Dynamic Stabilization CMC Splint

- The muscle contraction of thenar musculature prevents dorsal translation of metacarpal.
- Allows some movement for function without restricting other joints
- Must give it the squeeze!

Surgical Treatment

- Arthroplasty
  - Which Is Best?
  - Silicone Spacer
  - LRTI – usually uses FCR
  - LR only
  - Trapeziectomy only
  - Trapeziectomy and hematoma distraction
- Arthrodesis?
  - Only young, high demand patients require fusion

Hand Therapy following Basal Joint Surgery

- Cast immobilization varies with procedure – approx 4 weeks followed by hand based splint
- Edema reduction, ROM initial goals
- Strengthening deferred until 12 weeks post-op
- Review joint protection

Patient Experience

- PAINFUL INITIALLY
- Most return for second if needed
- Pain reduction takes several months

WRIST ARTHRITIS

Wrist Arthritis - Osteoarthritis

- *Wrist arthritis usually secondary to another condition*
- *SLAC wrist (Scapholunate Advanced Collapse)*
  - Most common pattern of wrist arthritis
  - Begins at radius-scaphoid joint
  - Progresses to capitolunate joint
  - Lunate instability with VISI or DISI pattern
    - *VISI – Volar Intercalcated Segment Instability*
    - *DISI – Dorsal Intercalcated Segment Instabilty*
    - *Radial-lunate space does not narrow (due to perpendicular loading)*

SLAC Wrist

Secondary Wrist OA

- *Keinbock's Disease*
  - Necrosis of the Lunate
  - Can lead to pan-carpal OA
- *SNAC Wrist (Scaphoid Non Union Advanced Collapse)*
  - Results from scaphoid fractures
  - Proximal pole of scaphoid interacts with lunate
  - Less collapse than SLAC wrist

Conservative Therapy

- Splinting
- Education

Surgical Option

- Proximal Row Carpectomy
  - Entire scaphoid row but not radial styloid
  - Useful when cartilage is preserved on capitate
  - Quicker return to motion, slower return to strength
  - Immobilize 6 weeks post op
  - Maintain 50% of flexion/ext, 80% strength

Surgical Options

- Carpal Fusion - 4 Corner Fusion
  - Used with SLAC/SNAC wrist
  - Screws or spider plate
  - Not used with Keinbocks

Surgical Options

- Wrist Fusion
  - *Do we need wrist motion?*
  - *Plates used*

Wrist Arthritis – Rheumatoid Arthritis

- *Large majority of rheumatoid patients have wrist involvement*
- *As disease progresses most develop bilateral wrist problems*
- *Fallout from Wrist RA*
  - Decreased motion
  - Risk of tendon rupture
  - Cascade of problems leading to finger ulnar drift
  - Decreased grip due to a poor base of support
  - Ligamentous laxity
  - Nerve compression
  - Are they using this wrist with an assistive gait device?

Conservative Hand Therapy

- Pain Control
- Stability!!!
  - *Splinting*
- Education
- Check for nerve compressions
- Isotoner glove at night

Post-Op Hand Therapy

- Partial wrist fusion (i.e radiolunate and radioscapholunate)
  - Can expect 30 degrees flex/ext
  - For patients with progressive deformity
  - No fixed deformity
  - May do distal ulna resection
  - Patient must have limited radiocarpal arthritis

Post-Op Hand Therapy

- Total Wrist Arthrodesis
  - For patients with persistent synovitis and pain
  - Impaired use of hand
  - Fixed deformity
  - Advanced disease

Osteo - Disease Process

- Managing OA
  - *Pain was significantly reduced after 24 months of strengthening program*
  - *Static and dynamic grip strength improved*
  - *No control non-exercise group*
  - *Hand exercises not tested in isolation*

Osteoarthrits - Medication

- NSAIDS: aspirin, ibuprofen, naproxen, and meloxicam
  - *Reduce swelling and inflammation and pain*
- Analgesics: acetaminophen, and tramadol
  - *Reduce pain NOT swelling*
  - *Less irritating to stomach*

Osteoarthrits - Medication

- Topical analgesics: biofreeze, ben-gay, capsaicin, etc
  - *Capsaicin depletes the neurotransmitter for pain*
- Cox 2 Drugs - targeted NSAIDs that don't cause stomach irritation
  - *Celebrex, Vioxx*
  - *Affect prostoglandins specifically in the areas of the swelling*

Rheumatoid – Disease Process

- Synovitis will be the underlying cause of the joint/muscle imbalances that we see with RA

Rheumatoid - Disease Process

- *Overview*
  - As the joint degenerates, synovium becomes inflammed.
  - Brain interprets this as pain
  - Increased synovial fluid as a compensatory strategy
  - Increased fluid causes edema, increased pain, stiffness
  - Synovium can invade tendons or tissue around tendons

Rheumatoid - Disease Process

- Periarticular bone osteopenia
- No osteophytes – just destruction of bone by the rheumatoid synovium
- Rheumatoid synovium secrets fluid which stretches out joint capsule and tissues
  - Invasive!
  - Can invade ligaments, tendons

Rheumatoid - Disease Process

- More often all finger joints – including MCP
- Patient Description of Symptoms
- 1 hour AM stiffness at least 6 weeks

Arthritis - Staying Healthy

- Maintain ideal body weight
  - *Good nutrition*
- Exercise regularly
  - *Therapist can help design exercise routine*

Arthritis - Staying Healthy

- Psychosocial intervention
  - *Dixon, et al Health Psychology*
  - *Review of 27 randomized controlled trials (over 3400 patients)*
    - Primarily cognitive-behavioral therapy to help with pain management
    - Counseling and coping skills showed the greatest impact on quality of life measures
    - Patients with pysch treatments had significant reductions in physical disability and joint swelling. No noted change in fatigue or stiffness
    - No statistically significant reduction in pain

Arthritis - Staying Healthy

- Does Occupational Therapy help?
  - *Cochrane Review of 38 studies*
  - *1700 people with RA*
  - *Studies included various OT techniques including counseling, joint protection training,splinting, teaching in the use of assistive devices vs. no therapy*

Arthritis - Staying Healthy

- Does Occupational Therapy help?
  - *Cochrane Review of 38 studies*
    - Results
      - *Strong evidence that instruction on joint protection is beneficial*
      - *Limited evidence that comprehensive OT improves functional ability*
      - *Splinting shown to decrease pain and improved grip strength but also cause decreased ROM of hand*

Arthritis - Joint Protection

- General Principles of Joint Protection
  - Avoid undue stress on joints

Arthritis - Joint Protection

- General Principles of Joint Protection
  - Use larger joints for load bearing if necessary

Arthritis - Joint Protection

- General Principles of Joint Protection
  - Do not maintain static positions for extended periods of time (i.e. grip)

Arthritis - Joint Protection

- General Principles of Joint Protection
  - Built-up handles to minimize grip force

Arthritis – Adaptive Devices

Arthritis – Adaptive Devices

Arthritis – Adaptive Devices

Assistive Devices - Evidence

- Rheumatology International March 2018, Amaral et al
  - *Assistive Devices: An effective strategy in non-pharmacological treatment for hand osteoarthritis – randomized clinical trial*
  - *Uses COPM (Canadian Occupational Performance Measure)*
  - *Intervention Group: Received AD*
  - *Control Group: Leaflet with info on joint protection*
  - *39 Patients (19 intervention, 20 control) Statistically significant differences for IG group at re-evaluation in COPM scores. Suggests AD as alternative to pharmacological treatment.*

Hand Exercise vs Joint Protection

- Article in Rheumatology 2015, based in UK
  - *People placed in one of 4 groups: Leaflet and Advice, Joint Protection only, Hand exercise only, Joint protection plus hand exercise.*
  - *"Joint protection was more costly and less effective than no joint protection. Hand exercises were slightly more expensive than no hand exercises but were more effective."*
  - *Assessed via a quality of life measure.*

General Hand Exercises for OA

- Fist – open and close fully and slowly 10 reps

- Claw Fist – Bend only top two knuckles, straighten completely. Repeat 10 times.

General Hand Exercises for OA

- Abduction – spread fingers wide 10 times

- Finger lift – oppose thumb to each finger 10 times

General Hand Exercises for OA

- Thumb Opposition - touch thumb to each fingertip.
  - *Repeat 10 times to each finger.*

- Gently squeeze a stress ball until mild fatigue

General Wrist Exercise for OA

- Prayer Ex – Start with hands by face and lower towards lap to increase stretch at wrist.
  - *Hold 5 sec; Repeat 10 times.*

- Reverse prayer/wrist flexion – Hold 5 sec; repeat 10 times

General Wrist Exercise for OA

- Circumduction of wrist – 10 reps each clockwise and counterclockwise

Gentle wrist strengthening

- In general strengthening and arthritis – must be cautious. Listen to PAIN!
- Wrist curls – start with no weight, .5lb can, progress only as tolerated!

How much resistance training?

Effects of Resistance Training on Muscle Strength, Joint Pain, and Hand Function in Individuals with Hand OA
Journal of Arthritis Research and Therapy

- Meta Analysis in looking at studies from 1975-2016
- There is moderate evidence for resistance training with hip – this study wanted to know if that held for hand OA
- Moderate quality evidence that resistance training does not improve grip strength
- Low quality evidence showed significant decrease in pain
- Low quality evidence, no improvement in hand function with resistance training.

Knitting in lieu of exercise?

- **The knitting community-based trial for older women with osteoarthritis of the hands: design and rationale of a randomized controlled trial.**
  - BMC Musculoskelet Disord. 2018 Feb 14;19(1):56. doi: 10.1186/s12891-018-1965-2.
  - Does knitting as exercise improve adherence to OA program and also resolve morning stiffness and pain relief?

Knitting in lieu of exercise?

- **The knitting community-based trial for older women with osteoarthritis of the hands: design and rationale of a randomized controlled trial.**
  - *Started as a case study with good results, expanded to a 5 person trial in prep for larger RCT*
    - All 5 women showed good relief of am stiffness and pain reduction for several hours after. One woman had never been a knitter and found compliance easy. No mandate on needle size, positioning. Frequency and duration were standardized.

DOCUMENTATION FOR MEDICARE

Arthritis Specific

General Rule of Thumb

- Medicare will not reimburse
  - Leisure skill retraining
  - Work related activity
  - Redundant Activity
  - Non-skilled intervention

General Medicare Rules

- Why therapy now?
  - Recent onset
  - Functional Status Change
  - Expected change in status with intervention

General Medicare Rules

- Clear goals for FUNCTION
- Expectation of progress in reasonable timeframe
- Treatment must need skilled therapist
- No maintenance

Examples

- CMC OA
  - Patient referred for short opponens splint
  - Assessment:
    - Patient was seen for one time visit for splint fabrication. CMC splint requested by MD for stabilization of arthritic joint. Splint fabricated, patient verbalizes independence with splint wear/care instructions. Patient also instructed in principles of joint protection on this visit.
  - Plan: One visit PRN to modify splint

Examples

- CMC OA
  - Patient referred for short opponens splint
  - What was missing from previous note?
  - What part of note might get denied?
  - How could this note have been improved?
  - What would be important measures to include?

Examples

- Joint Pain - OA in hands
  - Patient has generalized hand pain, ROM is WFL
  - During eval patient was issued home ROM program and joint protection handout to read at home.
  - How many visits do anticipate needing?
  - Write your note for visit 2, visit 3…

Examples

- Swan Neck Deformity and Pain
  - How many visits?
  - Name your treatment priorities
  - What must you be careful to include in your medicare documentation?

CASE STUDIES

Case #1 - GR

- Patient referred for osteoarthritis
- Eval on 7/18
- 55 y.o. female nanny
- 6 month history of hand pain
  - *Bilateral thumb pain and right elbow pain*
- Patient reports MD told her it is rheumatoid arthritis

Case #1 - GR

- Able to make a full fist
- Pain 5/10 daytime, 7/10 in AM
- Functional Issues:
  - *Pain with heavy lifting*
  - *Difficulty opening a jar*
  - *Difficulty brushing teeth*
  - *Difficulty lifting pots/pans*
  - *Difficulty carrying laundry basket*
  - *Difficulty opening doors*

Case #1 - GR

- What do you look for?
- What are your next steps?
- What are your goals?
- Any tests?

Case #1 - GR

- On eval patient is noted to have swan-necks on Left Middle, Ring, and Small finger
- Does this change your thinking?

Case Study #1 - GR

- My goals:
  - *Splinting for Swan Neck*
  - *Pt. verbalizes 3 joint protection techniques*
  - *Increase grip strength 5 lbs*
  - *Pain decreased to 3-4/10 for all daily activity*
  - *Patient independent to with thumb arthritis self management techniques*

Case Study #1 - GR

- Home program issued with eval:
  - *AROM: Abd/adduction, radial finger walk, lumbricals, hook fist, full fist*
  - *Joint protection handout given with overview presented*
- Call MD to clarify patient diagnosis - per MD patient with OA - not RA

Case Study #1 - GR

- 7/24 Second Visit
  - *Patient report small improvement*
  - *Paraffin introduced*
  - *Joint protection in detail with demo*
  - *Review splinting options for swan neck deformity*

Case Study #1 - GR

- 7/30 Third Visit
  - *Paraffin, towel grabs, thumb soft tissue/myofascial work, thumb joint mobs taught for home LLLT to bilateral thumbs*
  - *Referred for oval 8 splints*

Case Study #1 - GR

- Fourth Visit - 8/2
  - *Patient continues to report improvement*
  - *Add gentle putty ex*
  - *Kinesiotape for CMC OA*
- Fifth Visit - 8/7
  - *Patient very excited about improvement (4/10 daytime pain)*
  - *Teach patient self kinseiotape*
  - *Add "bubble" exercise*

Case Study #1 - GR

- Six visit - 8/13
  - *Patient reports pain is less frequent and she has less stiffness*
- Seventh and final visit 8/17
  - *Patient independent to tape*
  - *Awaiting appt for oval 8 splints*
  - *Pain 3/10 during daily routine*
  - *Strength increased 5 lbs each hand*
  - *Now able to brush hair, carry laundry, open doors, and brush teeth. Pain only with opening jar but using adaptive device.*

Case Study #4 - JT

- Referral for Thumb Pain
- 64 y.o. female, h/o thumb pain for 6 months
- No previous treatment
- Works as EASL teacher, lives alone
- Pain 6/10 with pulling, lifting groceries, flipping papers

Case Study #4 - JT

- What tests do you do?
- What do you need to rule out?
- What are your recommendations?
- What do you do first visit?
- How many visits do you recommend?

Topical and Alternative Treatment

- Glucosamine and Chondroitin?
  - *Studies show Glucosamine – questionable*
  - *Chondrotin – no proven effect*
  - *What to tell patients?*
- Nutritional recommendations?
  - *Capsacin?*
  - *Fish oil?*

Topical and Alternative Treatment

- CBD/Cannabidiol
  - *Marijuana without the marijuana*
  - *You will not get high*
  - *Salve, oil, pill*
  - *Anecdotal evidence…*
  - *Research…*
    - Animal models (rats, dogs) show benefit of topical CBD

Topical and Alternative Treatment

- Acupuncture
  - *Numerous studies have been done to determine whether this ancient Chinese practice is helpful to those with osteoarthritis. The results have been mixed, but there's some good evidence to support its use. For example, one meta-analysis of 12 different studies found that acupuncture was connected with:*
    - Significant reduction of pain intensity
    - Better functional mobility
    - Better health-related quality of life

"Pain management with acupuncture in osteoarthritis: a systematic review and meta-analysis." *BMC Complementary & Alternative Medicine.* 2014 Aug 23;14:312

Topical and Alternative Treatments

- Arnica shown to be comparable to NSAIDS in 2006 study
  - *Choosing between NSAID and arnica for topical treatment of hand osteoarthritis in a randomised, double-blind study Reto Widrig · Andy Suter · Reinhard Saller · Jörg Melzer Rheumatology Int.*
- BioFreeze, Ben-Gay, Tiger Balm

Questions?

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