Swelling Differential Diagnosis and Treatment Across Practice Settings: Making the Case for Improved Interdisciplinary Collaboration

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A little bit about me

• James Madison University → Chatham University → India → Lymphedema Cert → Outpatient Ortho → OCS

• 10 years clinical experience in Outpatient Orthopedic setting during which time I simultaneously diagnosed and treated both acute and chronic swelling, continuously striving to make treatment more efficient and effective for my patients

• Passionate about teaching – serve as adjunct faculty at Chatham University as well as am on faculty with the Institute for Clinical Excellence where I teach in the Virtual ICE curriculum and serve as the Director of Business Relations

• Owner of EVOKE Physio located in Aspinwall, PA where I provide one on one holistic care to my clients as well as provide strength training classes for members of the community.
WHY SHOULD I CARE ABOUT SWELLING?

• Commonly overlooked and underdiagnosed – “someone else will take care of it” “there’s nothing that can be done” “it’s a chronic condition so it can’t be helped” “treatment is cumbersome and costly” “my legs have always swelled” = MALADAPTIVE BELIEFS

• Accurate and timely diagnosis can prevent many undesirable complications and can accelerate our patients’ progress with rehab

• Swelling is a RELEVANT impairment to ALL clinical practice settings
Why should I care about collaboration?

Because it will improve your outcomes \textbf{and help your patients} !!!! (more on this later)
As PT’s with Direct Access, we are at an exciting crossroads of truly being able to act as a primary care providers for our patients....BUT ARE WE DOING OUR JOB INJUSTICE BY PICKING/CHOOSING TO ADDRESS WHAT WE AS PRACTITIONERS FEEL MOST COMFORTABLE TREATING?!

In the case of SWELLING, the truth is that most of us aren’t sure what to do which oftentimes results in complacency ...
Today’s plan

• Provide background information needed to differentially diagnose swelling, rule out acute pathology, and determine how/when it is appropriate to take action

• Provide brief look at examples of Orthopedic and Neuro cases which resulted in improved outcomes with addition of swelling management

• Provide in-depth look at a Pediatric case which benefited greatly from collaboration between PT disciplines as well as inter-professional collaboration.

• MAKE THE CASE FOR SHARED DECISION MAKING AND IMPROVED INTERDISCIPLINARY COLLABORATION!!
BUT WHAT IF I’M NOT A CERTIFIED LYMPHEDEMA THERAPIST?

IT’S OKAY, THERE ARE STILL WAYS TO TAKE ACTION!!
WHAT DOES IT MEAN TO TAKE ACTION?

• conduct a meaningful subjective and objective exam in regards to the swelling to rule in/out serious comorbid cause

• Formulate a meaningful and relevant hypothesis for our patients in regards to their swelling

• Be able to safely perform a trial treatment

• Be able to confidently contact the patient’s physician regarding relevant findings and concerns

• Be able to make appropriate referrals for additional testing or consultations if necessary (i.e. COLLABORATION!!)
ACTION OVER COMPLACENCY!!!

As you can see, there are many ways to take ACTION – and ACTION will lead to:

• improved outcomes
• decreased risk for additional complications, and
• improved overall patient satisfaction
When the patient has an extensive problem list, how do I decide what to prioritize (i.e. is the swelling worth treating)?

The magic combination that warrants CALL TO ACTION in regards to SWELLING is:

1. If there is reason to believe there is an acute underlying pathology that warrants immediate medical attention
2. If the patient BELIEVES that their swelling is impacting their function or progress in therapy
3. If YOU, as the practitioner, BELIEVE that the swelling is impacting their progress towards their functional goals OR places them at INCREASED risk for additional complications.
The Subjective Exam

• Where the magic happens

• 2 parts – SYMPTOM BEHAVIOR & PATIENT HISTORY

• Symptom Behavior
  - body chart, establish all areas where symptoms are present
  - establish patient’s level of irritability (aggs, eases)
  - clear uninvolved areas

• Patient History
  - Obtain a CLEAR TIMELINE
  - Relevant treatments and results of those treatments
  - Relevant PMH
  - treatment goals, patient’s perception of symptoms
The Body Chart

- Establish ALL areas where symptoms are present
- Clear “uninvolved” regions
- Establish Symptom Irritibility
- Investigate relationship between problem areas
- Form initial hypothesis list
Patient History

- OBTAIN A CLEAR TIMELINE – This is by the far the MOST important piece of the swelling puzzle
- Obtain a clear understanding of whether there was a new onset of other symptoms around the time that the swelling appeared (i.e. SOB, calf pain, presence of B swelling, rash, wound, fever/chills)
- If chronic, what are their aggs/eases? Pain with foot elevation? What have they tried to help their swelling problem?
- Do they have chronic renal failure or medically managed CHF?
- If prior compression was trialed, what kind? Did they see a specialist? Did they have their leg wrapped? Who measured them for compression socks and were they compliant with wearing them? Were they custom or off-the-shelf? Was there something in particular they didn’t like about them? Did they replace them at the recommended 6-month mark?
- Do they have a prior history of CA, CA-related tx, abdominal surgeries, family history of swelling, are they obese, are they sedentary, hx of varicose veins and/or vein stripping? Hx of cellulitis?
- How are they functioning? Does the presence of swelling impact their daily function? If so, how...?
Objective Exam

• Observation – presence of hemositerin staining, thickened nailbeds, wounds, drainage, hairloss below the knee, amount/degree of swelling compared to contralateral limb, presence of redness/rash/skin color or temperature changes?
• Palpation – fibrosis present? Painful to light touch? Soft, pitting edema?
• Well’s Rule (DVT and/or PE)
• Stemmer sign?
• Girth measurements
• Palpation of pulses
• ROM/Strength/functional measures as indicated
Differential Diagnosis

ACUTE CAUSES OF SWELLING WHICH NEED TO BE RULED OUT:

- Infection – fever/chills, warmth/redness
- Acute CHF – B swelling (often soft, pitting), SOB, weight gain, abdominal bloating, inability to lay flat
- Acute Renal Failure – B swelling (often soft, pitting), involves entire leg, weight gain, decreased urine output
- Acute DVT (Well’s Rule – even if low risk, use best clinical judgement)
- Severe arterial disease (ABI, pain with foot elevation, + Rubor of Dependency test, decreased capillary refill)
Differential Diagnosis cont’d (the GRAY areas)...

Once serious acute pathology is effectively ruled out, we are left with multiple diagnoses which can have a component of chronic swelling:

• Chronic Venous Insufficiency (hemositerin staining, thickened nailbeds, hairloss, usually below the knee, can be unilateral or B)

• Lymphedema or Lipidema (+ Stemmer sign, fibrosis, hard/non-pitting edema, skin changes)

• Swelling of non-acute systemic origin – Rheumatic disorders such as Lupus or RA, Lymes disease, medication-related, high levels of systemic inflammation (high gluten/sugar/processed carbohydrate diet)- usually multi-joint, bilateral, pitting

• Post-thrombetic syndrome- chronic, usually unilateral, pitting, hx of DVT

• CRPS – unilateral, chronic, sweating/pallor/irregular hair growth, Hx of traumatic injury

• Presence of significant post-operative or post-traumatic edema outside the joint capsule which is delaying the progress in PT (worse with underlying VI or lymphedema diagnosis)
Let’s focus on the GRAY AREA...

- Chronic swelling has been identified
- Acute cause has been ruled out
- Patient and provider believe swelling to be affecting progress with plan of care
- Communication with physician has taken place if indicated
- NOW WHAT?!
- (THIS IS TYPICALLY WHERE THE PATIENT GETS STUCK)
4 Choices ...

- Refer to lymphedema specialist (but what about their knee pain, which is after-all the reason they came to you in the first place)
- Treat and refer (maybe, but not likely due to insurance restrictions)
- Ignore the problem in hopes that it will gradually resolve over time
- PROVIDE A REASONABLE HYPOTHESIS TO THE PATIENT AND PERFORM TRIAL TREATMENT (WHAT??!)
What would a trial treatment look like?

• Lots of options!!
• Swelling management is an ART, not a math equation
• Often times it involves trial and error
• We are striving for even, graduated compression to push fluid up/out of involved limb and constantly monitoring the patient's response
• Education is EXTREMELY IMPORTANT!!
• We can try lots of fancy things like E-Stim, K-tape, Game Ready, etc... BUT with persistent swelling that is OUTSIDE the joint capsule, COMPRESSION is a NECESSARY component that CANNOT be overlooked
• If there is lymphatic involvement, basic MLD is indicated and can be performed!!
• Trial of tubigrip and/or compression sock – yes you can measure for these! (custom vs. RTW)
• Consultation with lymphedema therapist, medical supply company, or medical device sales rep
Let’s look at some case studies...

• Orthopedic
• Neuro
• Pediatric
CASE 1: Ortho

- 44 y/o male, slipped and fell at work, resulting in fracture of distal radius and distal ulna as well as large hematoma.
- Underwent ORIF as well as CTR (due to hematoma)
- Referred to PT 4 weeks s/p surgery
- Significant hand, finger, and wrist swelling impacting his ROM, strength, and functional grip
- Hypothesis: excessive post-operative, post-traumatic swelling impacting function and progress in therapy
- Trial treatment (in conjunction with primary treating therapist) included: retrograde edema massage, scar massage, 1x4” Elastomul, tubigrip (size D), and small piece of gray foam (see pictures)
- Therapist was able to perform treatment 3-4 times on an as-needed basis throughout the plan of care
Materials used: 1x4” Elastomul, Double layer Tubigrip, Gray Foam
Total time to perform trial treatment: 10 minutes
HUGE difference in ROM and grip strength after effective swelling management in conjunction with traditional rehab
Case 2: NEURO

- 70 y/o male with L sided hemiplegia 5 years s/p stroke
- Referred for gait/balance/strengthening
- Not wearing his AFO because his lower leg is swollen (chronic, no recent increase or change or presence of additional NEW sx)

- Observation: +1 pitting edema, hemositerin staining, thickened nail beds, shiny skin, hairloss (skin changes also present on contralateral limb)
- Presence of serious pathology was ruled out with thorough gathering of patient HX and Sx Behavior, Well’s Rule, stable vitals, etc.

- Hypothesis: VL likely due to dependent limb with lack of muscle pump
- Materials used: short stretch wrapping (Artiflex + Comprilan), also responded well to double layer tubigrip. Fit for RTW compression sock (Jobst Sport)

- 2-4 cm edema reduction with trial treatment, Jobst Sport kept edema under control
- Patient now able to wear AFO and progress towards functional goals
Helpful material to keep stocked in your clinic, regardless of practice setting...

- tubigrip (multiple sizes C, D, E, F, G)
- 1x4” Elastomul (finger/toe wraps)
- Tricofix (stockinette – F and G)
- 1-2 sheets of gray foam

- Helpful phone numbers (i.e. DME supplier that stocks compression supplies and can help you obtain products for patients, contact info for lymphedema therapist you know and trust)
- Jobst or Medi rep contact info (can come to your clinic to measure for a custom garment if needed)
CASE 3: PEDIATRIC

• HPI: 6 week old male infant referred for Early Intervention PT services by plastic surgery dept at CHP with diagnosis of gross motor delay s/p R brachial artery occlusion. Child was born with blood clot in R Brachial artery, was life-flighted to CHP immediately after birth where it was suggested that he undergo above-elbow amputation. Mom/dad declined amputation of the arm. The child underwent thrombectomy surgery x 2 as well as fasciotomy surgery to the R forearm. Mom reports healthy pregnancy with no prior knowledge of the presence of the clot. The child’s physical exam is normal other than his R arm.
WHAT WOULD YOUR EXAM INCLUDE? (THINK 6 M OLD INFANT, WHAT MILESTONES WOULD YOU EXPECT?)
Exam findings:

- Minimal muscle activation of R shoulder, no active elbow or wrist/hand movement observed
- Wound dressing in place (home care nursing had educated mom, who was providing regular dressing changes)
- Tracks objects with eyes
- Able to hold head in midline
- Asymmetrical weight-bearing in prone on elbows position, requires support to maintain body in midline
- Significant hand edema distal to wound dressing
WHAT INTERVENTIONS WOULD YOU DO?

(MAKE JOE SCHREIBER PROUD)!
**EI PT**

- Tummy time with assist to maintain head in midline and encourage equal weight-bearing through UE’s
- Use of toys to encourage tracking toward R side and engagement of R UE
- Sensory stimulation to R hand
- PROM and joint compressions to R elbow, R shoulder, R wrist/fingers

EI went on for about 6 weeks – improvement noted in active non-purposeful movement of R shoulder, but not with active movement of the elbow and wrist. Patient continued to follow-up with plastics dept. No additional recommendations were made as wounds were healing and looking better each visit 😊
Now what?

- Good progress in terms of wound healing
- Not so good progress in terms of AROM/strength/tone R UE distal to elbow
- Is it possible that the presence of the swelling is affecting his progress with PT?
Is swelling impacting the patient’s progress?

• Maybe? Hard to tell, but it’s certainly not helping...

• Pediatric EI therapist knew that something more could be done to help

• Plastic surgery dept was on board with addressing the swelling, but did not have any specific recommendations for the family or the therapist

• EI therapist took the initiative to COLLABORATE with a lymphedema therapist
Pediatric Lymphedema Evaluation

• Use of timeline, thorough hx, and objective findings to RULE OUT acute pathology

• WHAT WOULD YOU WANT TO RULE OUT?

• HOW MIGHT YOU GO ABOUT IT?

• WHO MIGHT YOU COLLABORATE WITH?
Pediatric Lymphedema Evaluation

- Phone consultation with family, EI therapist, and Jobst rep prior to evaluation visit

- Objective findings:
  - significant fascial restrictions R forearm
  - significant swelling R hand and fingers with no swelling proximal to forearm
  - decreased muscle tone R UE below elbow, no active movement observed of R hand or fingers, some active non-purposeful movement observed in R shoulder
  - radial deviation of wrist with notably shortened radius compared with ulna
  - all wounds healed with no abnormal signs of warmth or redness
Summary of progress between 3-7 months

• Child continued EI
• Mom independent with swelling management after 2 visits (as well as several phone consultations) – primarily compressed during sleeping hours, not compressed during waking hours to facilitate use of R arm/hand
• Normal physical development other than R UE
• Patient regained active use of R shoulder and elbow, but progress at wrist/hand was minimal
• As patient continued to grow, bone growth of radius/ulna and hand was inadequate
• Family had consultations with 3 different orthopedic surgeons, all whom agreed that is was unlikely for the child to ever gain use of his hand
• Consensus recommendation was for below-elbow amputation
• Child underwent BEA at 8 months
PT follow-up post amputation

- Fully healed limb
- Fit with compression sleeve to assist with shaping stump
- Patient/family member education
- EI services continue to address remaining deficits...
Points to highlight

• The pediatric EI therapist on this case TOOK ACTION on behalf of her patient – clearly this is a very unique case and one in which she did not feel comfortable treating the swelling, but she investigated options and she took CHARGE when the doctors/surgeons were not.

• The child was able to continue EI services, while simultaneously getting a few sessions of outpatient therapy (this might not be possible in some cases due to insurance restrictions)

• Collaboration occurred on many levels – Plastic Surgeon, EI PT therapist, family, Lymphedema therapist, Jobst rep, Pediatric Lymphedema Therapist, Orthopedic Surgeon

• Although regaining full functional use of the hand would have been an ideal outcome in this case, the family and all those involved believe that it was the collaboration of all team members which resulted in the child gaining function of the shoulder and elbow (and ultimately saving his elbow when above-elbow amputation had been the initial recommendation)
Interdisciplinary Collaboration

• Cochran Review (updated in 2018)

• Background: Poor Interdisciplinary collaboration can adversely affect the delivery of health services and patient care. Interventions that address IPC problems have the potential to improve interprofessional practice and healthcare outcomes

• Objectives: to assess the impact of practice-based interventions designed to improve IPC amongst health and social care providers, compared to usual care or to an alternative intervention on at least one of the following outcomes: patient health outcomes, clinical process or efficiency outcomes or secondary outcomes (collaborative behavior).

• 9 studies (6 RCT’s), interventions included mix of team rounds, team meetings, interprofessional checklists

• Conclusion – Healthcare professionals adherence to recommended practices may be improved with externally facilitated IPC activities but further high quality research is needed.
Concept of ‘Shared Decision Making’

2018 Cochran Review

Background: Shared Decision Making - ‘a process by which a healthcare choice is made by the patient, significant others, or both with one or more healthcare professionals’

Objective: determine the effectiveness of interventions to increasing SDM by healthcare professionals

Methods: 87 Studies (45, 641 patients and 3113 healthcare professionals), interventions varied – some targeting improving patient engagement, some targeting improved healthcare professional collaboration

Conclusion: SDM is widely used and recommended, however due to fact that the certainty of the evidence is low, it is uncertain at this time whether interventions used to increase SDM by healthcare professionals is effective – need more high quality research!!
Interdisciplinary education

• Cochran Systematic Review, 15 studies, measuring effectiveness of interprofessional education compared to no educational intervention

• 7 studies indicated that IPE resulted in positive outcomes in the following areas: Diabetes care, emergency department culture and patient satisfaction, collaborative team behavior, reduction in clinical error rates for ER dept teams, collaborative team behavior in operating rooms

• 4 of the studies revealed mixed outcomes (positive and neutral) and 4 revealed that IPE interventions had no impact on either professional practice or patient care

• CONCLUSIONS: Interdisciplinary Education offers a way to improve interprofessional collaboration and patient care. Although many positive outcomes were observed, generalizable conclusions regarding the elements of and the effectiveness of IPE interventions need to be further studied
An example of true leadership

• We don’t have to specialize or be experts in EVERYTHING – striving to do so would be IMPOSSIBLE

• What we CAN do is have the mind-set of “Extreme Ownership” when it comes to our patients and take action on their behalf to improve their outcomes

• We can treat the WHOLE patient, and when we aren’t sure if we’re capable we can communicate with someone who is.

• We can own every part of our patient’s case, thereby solving problems more efficiently and more effectively which will undoubtedly improve patient satisfaction, outcomes, and arguably our own career satisfaction
In summary...

• As clinicians, we should actively seek to FILL KNOWLEDGE GAPS through a continual process of self-evaluation and targeted continuing education

• We should strive to be better LISTENERS because only then will we HEAR our patients WELL and understand their BELIEFS surrounding their condition

• We should practice HUMILITY and seek advice or help from colleagues when needed

• We should intentionally COLLABORATE with each other within our profession as well as with other healthcare disciplines because THE EVIDENCE SUPPORTS THAT WE DO SO (although further high quality research is needed) ;)

“You can do what I cannot do.  
I can do what you cannot do.  
Together we can do great things.”

- Mother Teresa
References


Legare, F. (2018) Interventions for increasing the use of shared decision making by healthcare professionals. Cochran Review. Issue 8


