Indications for Musculoskeletal Injections: Focus on Corticosteroid Injections

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History of corticosteroid injections

• Early 1900s- Janet Travell, MD

• 1951- Joseph Hollander, MD
### Risks/Aims of Corticosteroid Injections

<table>
<thead>
<tr>
<th>Risks</th>
<th>Potential Benefits</th>
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<tbody>
<tr>
<td>• Damage to underlying structures</td>
<td>• Improved pain</td>
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<td>• Skin depigmentation</td>
<td>• Improved function</td>
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<td>• Muscle atrophy</td>
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<td>• Tendon rupture</td>
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<td>• Infection</td>
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<td>• Bleeding</td>
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<td>• Hyperglycemia</td>
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Where are we headed?

- Shoulder
- Elbow
- Hand
- Hip
- Knee
Shoulder
Indications: Shoulder corticosteroid injection

- Adhesive capsulitis
- Impingement syndrome
- Glenohumeral osteoarthritis (OA)

Indications: Shoulder corticosteroid injection

Adhesive capsulitis

• What is adhesive capsulitis?

• Presentation?

• Evidence:
  • Injected steroid versus oral steroids, PT, NSAIDs?
  • Intra-articular versus subacromial?
  • Duration of effectiveness?

• Bottom line?

  Steroid injections for AC are generally effective in the short term given in either the subacromial space or in the glenohumeral joint. May not provide better outcomes than PT, but may be helpful for pain relief and QOL.
Indications: Shoulder corticosteroid injection

Impingement Syndrome

- What is impingement syndrome?

- Presentation?

- Evidence:
  - Injection approach?
    - Injected steroid versus other treatment modalities?

- Bottom line?

  **Try conservative measures for impingement syndrome first, then consider subacromial injection.**
Indications: Shoulder corticosteroid injection
Glenohumeral Osteoarthritis

• What is glenohumeral osteoarthritis?

• Presentation?

• Evidence:
  • Only one study at this point looking at corticosteroid injection

• Bottom line?

For glenohumeral OA, there is no great evidence for CS injection at this time. Could try in cases of refractory pain.
Ultrasound-guided injections versus landmark-based injections in the shoulder?

- Glenohumeral joint?
  - Ultrasound ideal

- Subacromial space?
Elbow
Indications: Elbow corticosteroid injection

- Lateral epicondylitis
- Medial epicondylitis

Indications: Elbow corticosteroid injection
Lateral epicondylitis

• What is it?

• Presentation?

• Evidence:
  • Duration of effect?
  • Recurrence rate?

• Bottom line?

For lateral epicondylitis, there is high recurrence rate with injection, and improvements are short-term.
Indications: Elbow corticosteroid injection
Medial Epicondylitis

• What is it?

• Presentation?

• Evidence:
  • Improvement in pain?
  • Duration of effect?

• Bottom line?

CSI for medial epicondylitis shows short term decreases in pain levels, but long term pain relief is not consistently seen.
Ultrasound-guided injections versus landmark-based injections in the elbow?

• Studies only done for intra-articular injections, no studies for lateral or medial epicondylitis.

• Lack of evidence to give concrete recommendation.
Hand/Wrist
Indications: Hand/wrist corticosteroid injection

- Carpal tunnel syndrome
- DeQuervain’s tenosynovitis
- Trigger finger
- Osteoarthritis

https://www.google.com/
Indications: Hand/wrist corticosteroid injection

Carpal Tunnel Syndrome

• What is it?

• Presentation?

• Evidence:
  • Improvement in symptoms?
  • Versus systemic corticosteroid?
  • Duration of benefit?
  • Rates of surgical intervention?

• Bottom line?

CS injection for CTS can help with symptoms in short term and may increase time before surgery is required, but high recurrence rate and many patients end up needing carpal tunnel release.
Indications: Hand/wrist corticosteroid injection

DeQuervain’s tenosynovitis

• What is it?

• Presentation?

• Evidence:
  • Somewhat difficult injection
  • Efficacy?

• Bottom line?

For DeQuervain’s tenosynovitis, consider CS injection. Refer if no improvement in symptoms with injection as there may be anatomic variation in first dorsal compartment affecting injection efficacy.
Indications: Hand/wrist corticosteroid injection
Trigger Finger

• What is it?

• Presentation?

• Evidence:
  • Duration of pain symptom relief?
  • Repeat injections?
  • Surgery?

• Bottom line?

  Physicians should offer steroid injection for trigger finger.
Indications: Hand/wrist corticosteroid injection
Hand/wrist osteoarthritis

• What is it?

• Presentation?

• Evidence:
  • Very little

• Bottom line?
  There is insufficient evidence to recommend corticosteroid injection for hand/wrist OA. Refer to subspecialist if you feel may be beneficial for patient as technically difficult area.
Ultrasound-guided injections versus landmark-based injections in the wrist/hand?

- **Carpal tunnel syndrome?**
  - 1 study, 46 median nerves
  - Improvements in symptom severity scores greater and average time to symptom relief shorter in US guided group.

- **DeQuervain’s?**
  - Can have multiple subcompartments which can affect efficacy
Ultrasound-guided injections versus landmark-based injections in the wrist/hand?

• Trigger finger?
  • Study done by Cecen et al. in 2014 → no significant difference in US versus landmark-guided injection.

• Hand/wrist osteoarthritis?
  • Multiple studies show increased injection accuracy with US guidance.
Hip
Indications: Hip corticosteroid injection

- Greater trochanteric pain syndrome
- Osteoarthritis

https://www.google.com/
Indications: Hip corticosteroid injection
Greater trochanteric pain syndrome

• What is it?
  • Change in nomenclature based on histologic changes

• Presentation?

• Evidence?
  • Injection versus “usual care”? 
  • Pain relief/”recovery”
  • Duration?

• Bottom line?
  
  For greater trochanteric pain syndrome, can consider injection if patients desire quicker relief of pain.
Indications: Hip corticosteroid injection
Osteoarthritis

• What is it?

• Presentation?

• Evidence?
  • Numbing agent +/- steroid
  • Duration of efficacy?

• Bottom line?

Steroid injections can be helpful for relief of pain in hip OA; however, this is an anatomically difficult area to inject without imaging guidance and would recommend referral for this procedure.
Ultrasound-guided injections versus landmark-based injections in the hip?

• **Trochanteric pain syndrome**
  - Mitchell et al., RCT of 40 patients → more improvement in pain scores in US guided group at 6 months.

• **Hip osteoarthritis**
  - 2 studies looking at accuracy of landmark-guided injections. Between 67 and 78% accuracy.
  - Case series done by Pourbagher et al. showed 80% with improvements in function and pain after US guided injection.
  - No comparative studies to date.
Knee
Indications: Knee corticosteroid injection

• Osteoarthritis

https://www.nuffieldhealth.com/local/4b/72/7a13c6f249d2bc477e0ecf3bc73f/happyknees500x300.jpg
Indications: Knee corticosteroid injection
Osteoarthritis

- What is it?

- Presentation?

- Evidence?
  - Duration of pain relief?

- Bottom line?

  **For knee osteoarthritis, CS injection can be used prior to referral for surgical evaluation.**
Ultrasound-guided injections versus landmark-based injections in the knee?

• **Osteoarthritis**
  • Landmark-based injections
    • Accuracy depends on approach taken, ranges between 67-91%
  • Superolateral approach most accurate

• Landmark versus US guided injections
  • Accuracy of injection ranging from 63-100% with ultrasound versus landmark accuracy between 39 and 100% based on 2012 review
  • Study done by Sibbitt et al. suggestive of cost benefit for US guided injection versus landmark
Okay, but what kind of steroid do I use? And how much?

<table>
<thead>
<tr>
<th>Injection location</th>
<th>Steroid type</th>
<th>Steroid Dose</th>
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<tbody>
<tr>
<td>Glenohumeral joint</td>
<td>TA may be better than MPA for adhesive capsulitis</td>
<td>40 mg no better than 20 mg for adhesive capsulitis</td>
</tr>
<tr>
<td>Subacromial space</td>
<td>MPA may be better than TA for pain</td>
<td>80 mg similar to 40 mg, but 40 mg better than 20 mg</td>
</tr>
<tr>
<td>Hip joint</td>
<td>Similar efficacy for MPA or TA</td>
<td>Longer duration of improvement in 80 mg compared to 40 mg</td>
</tr>
<tr>
<td>Knee joint</td>
<td>TH better than TA, MP, and B</td>
<td>40 mg equivalent to 80 mg</td>
</tr>
</tbody>
</table>

TA= triamcinolone acetate; MPA=methylprednisolone acetate; TH=triamcinolone hexacetonide; B=betamethasone

Table adapted from Table 1 in Cushman, Daniel M., et al. “Efficacy of Injected Corticosteroid Type, Dose, and Volume for Pain in Large Joints: A Narrative Review.” PM&R, vol. 10, no. 7, 2018, pp. 748–757
Parting thoughts...

- Biomechanics are key for long term outcomes!

https://www.verywellfit.com/
Works Cited


