Educational Guidelines for Intervventional Spinal Procedures

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Critical Review – June 2001, pgs. 4-31: Charles Aprill, MD; Nikolai Bogduk, MD; Roger Catlin, MD; Richard Derby, MD; Paul Dreyfuss, MD; Stephen Endres, MD; Michael Furman, MD; Michael Geraci, Jr., MD; Michael Karasek, MD; Garrett Kine, MD; Roy Lerman, MD; Gregory Lutz, MD; Gerard A. Malanga, MD; Michael McCann, MD; John Prunskis, MD; Lawrence Rosenfield, MD; Steven Sabers, MD; Terry Sawchuk, MD; Barry Smith, MD; Jeffrey Young, MD; and Stuart Weinstein, MD

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Critical Review – January 2004, pgs. 32-44: David L. Bagnall, MD; Bruce E. Becker, MD; Stuart M. Weinstein, MD

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Editorial Update – June 2007: Larry H. Chou, MD; Kirk M. Puttlitz, MD; Santhosh A. Thomas, DO; and Joseph P. Zuhosky, MD

Editorial Update – May 2008: Brian A. Casazza, MD; Larry H. Chou, MD; Shelton A. Davis, MD; David K. deDianous, MD; Paul H. Lento, MD; Scott T. Roberts, MD; Michael Saffir, MD; and Joseph P. Zuhosky, MD

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Disclaimer: Physician discretion is recognized with medication dosage. These guidelines mention commonly used doses. This document, based on consensus opinion, is an educational tool and not to be considered a practice guideline.
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The universal protocol applies to persons receiving the interventions listed below. These individuals should be properly identified through use of at least 2 patient identifiers. Prior to the start of any of these procedures, the providers and staff involved in the procedure should conduct a final verification, mark the site if necessary, and take a time-out so as to confirm the correct patient, procedure, and site using active communication techniques. Procuring active patient involvement in their own care provides an added benefit for patient safety.

Recommended Pre-procedure Anticoagulant Holding Schedule

Medications and compounds affecting clotting mechanisms pose a potential risk for iatrogenic hematoma during the performance of spinal procedures. Therefore, these medications are relative contraindications when performing spinal procedures outside the neural axis and considered to be absolute contraindications when performing procedures within the neural axis.

Although they are considered absolute contraindications when performing procedures within the lumbar and sacral neural axis, specifically in these regions, the risk of cord compression or myelopathy is minimal or nil, and therefore the risks/benefit ratio for stopping anticoagulants when performing lumbar neural axis procedures must be considered. There may be situations where the risk of hemetoma may be outweighed by the risk associated with discontinuing anticoagulants or avoiding the procedure.

The following medication holding schedule is suggested; optimally after authorization is obtained from the physician initiating or prescribing the anti-coagulant.

<table>
<thead>
<tr>
<th>Medication or Compound</th>
<th>Days to hold before procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin or aspirin containing medications: (i.e., Excedrin, Equagesic, synalogos-DC, BC Powder)</td>
<td>7 days</td>
</tr>
<tr>
<td>Non-steroidal anti-inflammatory drugs: (i.e., ibuprofen, Naproxen, Mobic, Arthrotec, Relafen, Daypro and Celebrex)</td>
<td>3 days</td>
</tr>
<tr>
<td>Coumadin (warfarin)</td>
<td>6 days</td>
</tr>
<tr>
<td>Ticlid (ticlopidine)</td>
<td>14 days</td>
</tr>
<tr>
<td>Plavix (clopidogrel)</td>
<td>10 days</td>
</tr>
<tr>
<td>Pletal (cilostazol) and Trental (pentoxifylline)</td>
<td>2 days</td>
</tr>
<tr>
<td>Persantine (dipyridamole)</td>
<td>7 days</td>
</tr>
<tr>
<td>Aggrenox (dipyridamole/aspirin)</td>
<td>7 days</td>
</tr>
<tr>
<td>Herbals containing ginger, ginko biloba, or feverfew</td>
<td>7 days</td>
</tr>
<tr>
<td>Orgaran (damaparoid)</td>
<td>5 days</td>
</tr>
<tr>
<td>Heparin, Lovenox (enoxaparin), Innohep (tinzaparin), Fragmin (dalteparin), Normiflo (ardaparin)</td>
<td>12 hours</td>
</tr>
<tr>
<td>Vitamin E (greater than 400 IU)</td>
<td>7 days</td>
</tr>
</tbody>
</table>
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Sacroiliac Joint Injection

I. Rationale

Controlled studies demonstrate that the prevalence of intra-articular sacroiliac joint (SIJ) pain ranges from 13-30%\(^1,13\). Though SIJ pain cannot solely be diagnosed by history or clinical examination alone\(^2,3,4\), composite examination techniques may improve clinical diagnostic accuracy \(^5,6\). Unfortunately imaging techniques such as plain film radiographs\(^7\), SPECT scanning\(^8\) or MRI are not reliable in diagnosing sacroiliac joint dysfunction. MRI may aid in early diagnosis and disease progression in cases of inflammatory sacroilitis due to spondyloarthropathy\(^9\), however these changes may not be associated with clinical symptoms\(^10\). Diagnostic block of the SIJ is the only means available to confirm or deny the SIJ as a pain generator, although a single sacroiliac joint diagnostic block may have a false positive response of 7.7-20.5%\(^11,12\).

II. Indications

SIJ Injections are primarily diagnostic and may facilitate other treatment options such as manual or physical therapy. Indications for therapeutic sacroiliac joint injections also included those patients with sacroilitis as well as sacroiliac joint dysfunction. Long-term efficacy has been reported in those with SIJ pain due to inflammatory spondyloarthropathies\(^13\). Studies revealing the efficacy of fluoroscopically guided joint injections due to sacroiliac dysfunction have been limited\(^14\). One retrospective study involving patients with sacroiliac joint dysfunction based on a single diagnostic injection showed improvement in pain and functional scores\(^15\). The sacroiliac joint has also been considered a pain generator in approximately 30-35% of patients following lumbar fusion surgery\(^16,17\) but to date no outcomes have been reported following therapeutic SI joint injections. Consideration for an SI joint injection should be limited to those with pain below L5\(^5\) who failed to respond to conservative treatment, and have had pain for the duration of at least four weeks. With severe limitation of function, one could perform the injection prior to the initiation of therapy to facilitate the therapy. There is no role for a series of sacroiliac joint injections given without regard to response of initial diagnostic or therapeutic injection. Although short term effects of repeated steroid injections appear to be safe in some synovial joints, long-term effects on the sacroiliac joint are unclear at this time. Therefore, repeat sacroiliac steroid injections should be limited to 3-4 injections in a year\(^18\).

III. Contraindications

Absolute

- Bacterial infection: systemic or localized at injection site
- Bleeding diathesis: due to anticoagulants or hematological disease

Relative

- Allergy to injectants; steroid psychosis
- Pregnancy
- NSAIDs, aspirin, or other antiplatelet agents (e.g. Ticlid, Plavix, Coumadin, Trental, Pletal, Heparin, Lovenox, Innohep, Fragmin, Normiflo, Persantine, Aggrenox, Ginko Biloba, Orgaran, and Damaparoid)
- Hyperglycemia, adrenal suppression, immune compromise, or congestive heart failure

IV. Complications

Potential complications include, but are not limited to:
- Worsening pain
- Infection (abcess, discitis, meningitis, osteomyelitis, sepsis)
- Bleeding (local or intrapelvic)
- Cardiovascular (dysrhythmias, congestive heart failure, vasovagal reaction)
- Respiratory (oversedation)
- Pelvic organ injury due to improper needle placement and/or visualization
- Neurologic injury (direct neural trauma, compression from hematoma or abscess, vascular particulate injection, spinal cord injury, stroke, seizure)
- Adverse local anesthetic drug reaction (CNS and cardiovascular toxicity, restlessness, anxiety, incoherent speech, light-headedness, perioral paresthesias, blurred vision, tremors, drowsiness, seizures, cardiac arrest)
• Adverse steroid reaction (facial flushing, hyperglycemia, injection site hypopigmentation, subcutaneous fat atrophy, increased appetite, fluid retention, gastritis, malaise, euphoria, insomnia, headache, immunosupression, aseptic meningitis, arachnoiditis, congestive heart failure, increased intraocular pressures, adrenal insufficiency, steroid myopathy, mania, menstrual irregularity)

• Allergic reaction (to non-ionic contrast agent allergy, local anesthetic, corticosteroid, or latex causing urticaria, laryngeal edema, bronchospasm, anaphylaxis)

Potential post-procedural complaints include, but are not limited to:
• Vasovagal reaction (hypotension, bradycardia, nausea, pallor, diaphoresis, syncope)
• Pain (injection site, radicular, corticosteroid flare)
• Headache (corticosteroids, dural puncture)

V. Objective
To deliver injectant, including contrast, anesthetic, and corticosteroid, into the SIJ, to both test the hypothesis that the sacroiliac joint is the source of pain and to decrease intra-articular inflammation.

VI. Materials
A. Equipment and Supplies
1. Fluoroscopy is mandatory
2. 22-26 gauge spinal or Chiba needle is recommended
3. Medication and contrast syringes
4. Connection tubing (recommended so that contrast can be injected during fluoroscopic visualization to confirm proper anatomical and extra-vascular needle placement)
5. Physiologic monitor (optional)
6. Skin marker (optional)

B. Medications
1. Intravenous solutions, sedation, or antibiotics are not mandatory

C. Agents (total volume up to 2.5 ml per joint.)
1. Contrast medium
   Radiographic contrast medium is essential to confirm extra-vascular and intra-articular needle placement. A nominal amount (0.1-0.3 ml) is sufficient. It is used to obtain an arthrogram prior to any subsequent injection. Examples include Omnipoque 240 and Isovue 300/370
2. Local anesthetics (combined with the corticosteroid in a 2:1 or 1:1 ratio)
   Agents commonly used include lidocaine 1%-2% and bupivacaine 0.25%-0.50%
3. Corticosteroids
   Employed to decrease intra-articular inflammation and facilitate more aggressive conservative care; not as a treatment isolation

VI. Technique
A. Preparation
Physiologic monitoring is recommended and intravenous access is not mandatory. Skin is steriley prepared. Sedation should be avoided or short acting to prevent analgesic effect.

B. Target Identification
Patient prone. Image two divergent joint planes (silhouettes) on AP or ipsilateral oblique view. The medial joint silhouette represents the posterior joint plane and the lateral joint silhouette the anterior joint plane. Purposefully attempt to radiographically ‘separate’ the anterior and posterior joint planes. Next, optimally visualize the medial silhouette (this occurs when the inferior aspect of the medial cortical line is maximally defined). The target is within the inferior 2.0 cm aspect of the medial joint silhouette.

If the above technique fails, an alternative target is the hyperlucent zone formed where the caudal aspects of the medial and lateral joint silhouettes cross with rotation of the C-arm.
An additional alternate target is the upper one-third of the joint silhouette. This target is reached by imaging contralateral oblique, superimposing the medial and lateral joint silhouettes. Continue rotating contralateral oblique until the ipsilateral iliac crest no longer obscures the joint lines. The iliac crest will appear to shift laterally as the image intensifier is rotated contralateral oblique. The target is within the joint silhouette.

C. Needle Placement

The needle punctures the skin directly over the target and the shaft of the needle is directed along the axis of the x-ray beam. Capsule penetration is perceived with a subtle change of resistance. Confirm intra-articular needle placement by injecting a trace amount of contrast during fluoroscopic visualization. It is not necessary to obtain a complete arthrogram. After confirmation, up to 2.5 cc of injectant is introduced.

D. Assessment

Following completion of injection the patient is asked to rate his pain while attempting to provoke his usual symptoms. Significant pain relief (75-100%) lasting equal to or greater than the expected duration of the anesthetic suggests a positive response. Long-term relief attributed to the corticosteroid should also be noted.

References