



Elbow Joint, Intra-articular Injections

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Essential Concepts

- Intra-articular injections for the elbow are performed to provide pain relief for rheumatoid arthritis, degenerative joint disease, or crystal arthropathies.
- The injection is typically performed by landmark technique.
- Elbow intra-articular injections are easy to perform, well-tolerated, and have few side effects.
- Transient resolution of pain with elbow injections occurs but long-term pain relief for months to years has not been demonstrated.

1 Intra-articular Elbow Injection

Overview

The intra-articular elbow injection is performed to provide pain relief and reduce inflammation, with the goal of improving functional status for the patient. This procedure should be considered after non-invasive interventions have been utilized, such as multimodal medication therapy with acetaminophen and Non-Steroidal Anti-inflammatory Drugs, physical therapy, and heat and ice application. As a bedside procedure, elbow intra-articular injections are easy to perform, well-tolerated, and have few side effects. Although the use of ultrasound is gaining popularity with

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periarticular elbow injections, literature does not support the use of ultrasound technique for injection within the elbow joint [1]. Alternative medications such as hyaluronic acid are also not indicated [2].

2 Indications and Contraindications

A summary of the procedure, indications, techniques, and contraindications is presented in Table 1.

3 Clinical Anatomy

The needle approach into the elbow joint capsule can be determined by identifying the lateral epicondyle, olecranon process, and the radial head. These osseous structures can be palpated superficially. Labeled anatomy is shown in Figs. 1 and 2.

4 Equipment and Supplies

In addition to alcohol or chlorhexidine sterile preparation, sterile gloves, and sterile towels, a summary of necessary equipment is presented in Table 2. Ultrasound machine is optional.

5 Intra-articular Elbow Injection, Landmark Technique

The procedure is performed with the patient in the sitting position. Position the arm on a table with the lateral portion of the arm exposed and the elbow flexed at 45°. The olecranon process, lateral epicondyle, and the radial head form a triangle that provides a target for needle insertion (Fig. 3) [3]. Outlining this triangle with a surgical marker is optional. Insert the needle in the middle of the “triangle” and direct toward the medial epicondyle. Advance the needle until clear fluid is aspirated. Aspiration of clear fluid indicates adequate needle position in the joint capsule. The medication can then be injected. If bone is contacted, withdraw and redirect.

Table 1 Intra-articular elbow injections for management of elbow pain

Procedure	Indications	Technique	Contraindications
Intra-articular elbow injection	Rheumatoid arthritis, degenerative joint disease, crystal arthropathy	Landmark	Patient refusal, active joint infection, cellulitis, systemic infection

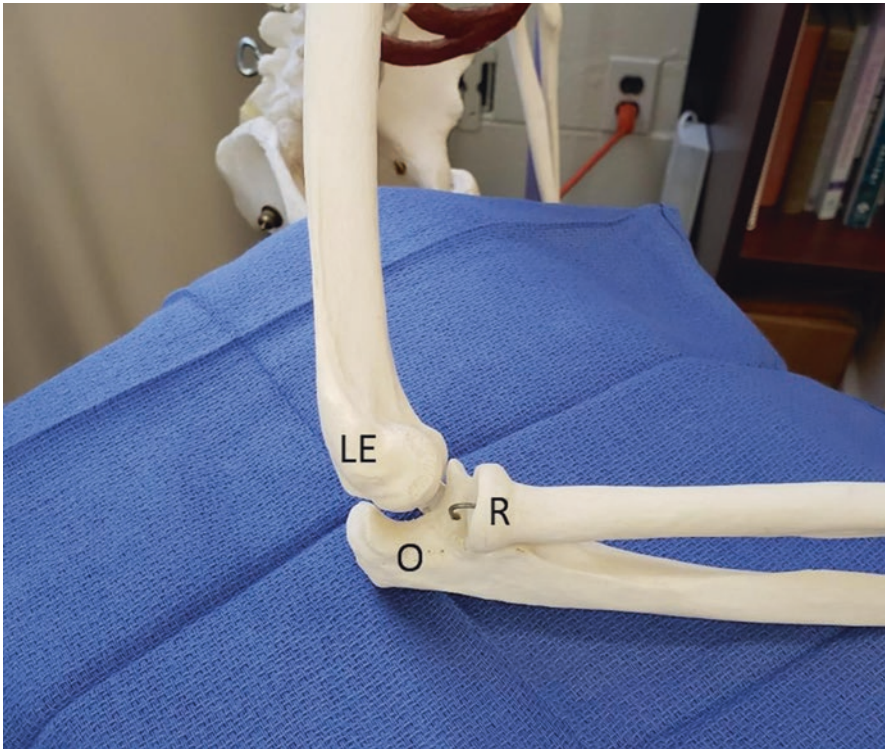


Fig. 1 Labeled anatomy of the elbow joint with respect to osseous structures. *LE* lateral epicondyle, *R* radial head, *O* olecranon

6 Ultrasound Technique

Ultrasound technique is not preferred for this procedure due to poor acoustic windows of the injection target. Although ultrasound has been used for elbow joint aspiration in the setting of pathologic fluid collection, the literature does not yet support this technique for the elbow joint [4].

7 Potential Complications and Adverse Effects

Elbow intra-articular injections are easy to perform and well-tolerated. Reported side effects for intra-articular elbow injections have not been reported but a number of side effects from periarticular injections have been reported [5]. Possible side effects are listed below.

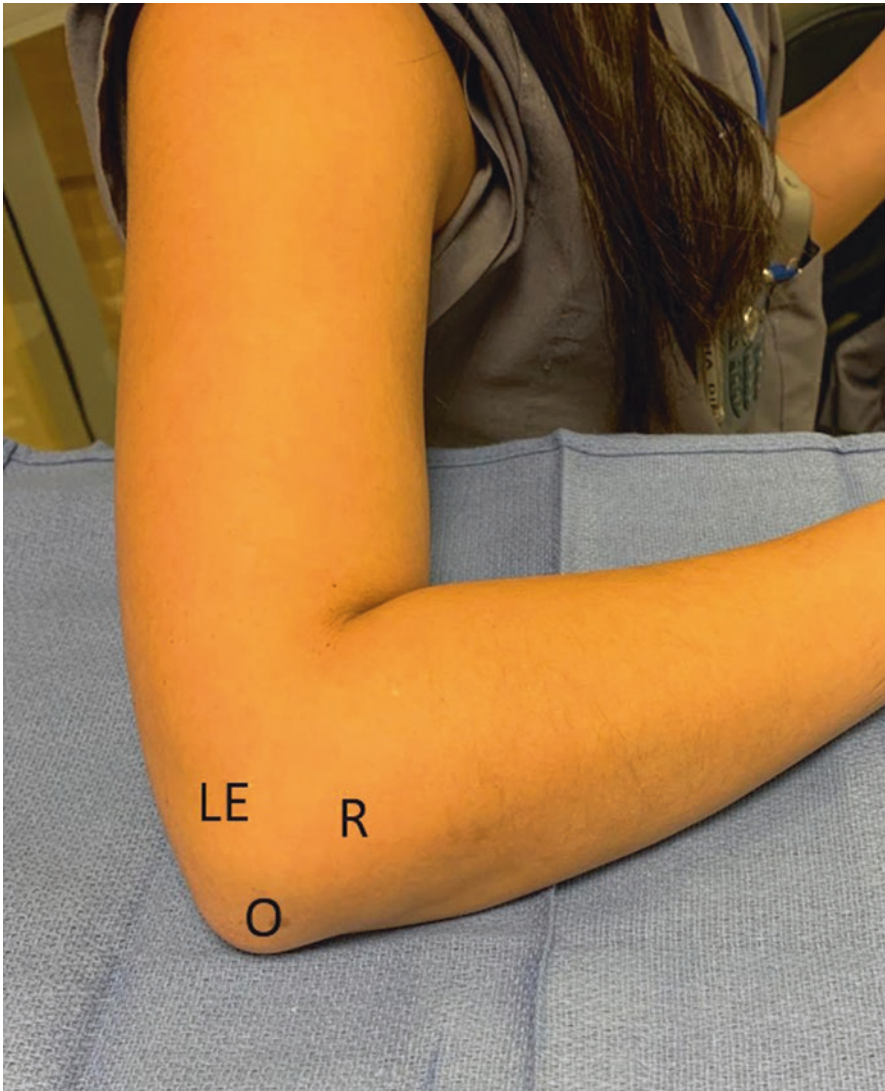


Fig. 2 Labeled surface anatomy of the elbow joint. *LE* lateral epicondyle, *R* radial head, *O* olecranon

Table 2 Necessary equipment for intra-articular elbow injection

Syringe	Needle	Anesthetic	Corticosteroid
5 cc, sterile, Luer lock tip	25 gauge, 1–1.5 in.	3–5 mL 1% lidocaine, 0.25% bupivacaine, 0.25% ropivacaine, or equivalent strength	1–2 mL betamethasone (6 mg/mL) or 1–2 mL methylprednisolone (40 mg/mL)

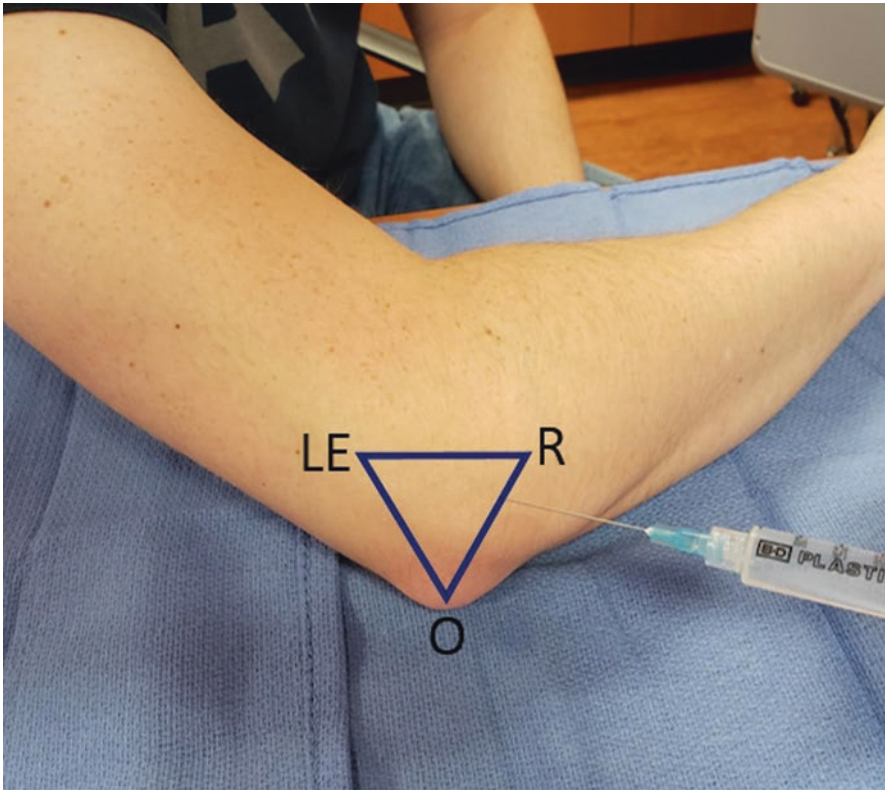


Fig. 3 Labeled surface anatomy of the elbow joint. The middle of the triangle that connects the relevant structures represent the ideal entry point for needle insertion. *LE* lateral epicondyle, *R* radial head, *O* olecranon

Procedure-related [6]

Anxiety

Discomfort

Minor skin infection

Bruising

Glucocorticoid-associated toxicity [6].

Post-injection flare

Facial flushing

Local skin or fat changes

Osteonecrosis

Cartilage damage

Systemic effects

Bleeding

Allergic reaction

Clinical and Technical Pearls

- Aspiration of clear fluid is the standard for confirmation of adequate needle position. Therefore, landmark technique is likely to be faster and more accurate than ultrasound technique for the elbow intra-articular injection.
- Prior local infiltration of the skin with 1% lidocaine may decrease discomfort during the joint injection.
- Patient expectations are important. As an isolated intervention, transient relief over weeks to months may occur, but long-term relief is not expected.

References

1. Daley EL, Bajaj S, Bisson LJ, Cole BJ. Improving injection accuracy of the elbow, knee, and shoulder. *Am J Sports Med.* 2011;39(3):656–62.
2. Van Brakel RW, Eygendaal D. Intra-articular injection of hyaluronic acid is not effective for the treatment of post-traumatic osteoarthritis of the elbow. *Arthroscopy.* 2006;22(11):1199–203.
3. Cardone DA, Tallia AF. Diagnostic and therapeutic injection of the elbow region. *Am Fam Physician.* 2002;66(11):2097–100.
4. Reijiniere M, Miller TT. Video: musculoskeletal ultrasound imaging of the elbow: part 2, pathology. *AM J Roentgenol.* 2013;200(6):W645.
5. Brinks A, Koes BW, Volkers AC, Verhaar JA, Bierma-Zeinstra SM. Adverse effects of extra-articular corticosteroid injections: a systematic review. *BMC Musculoskelet Disord.* 2010;11:206.
6. Roberts WN, Hauptman HW. Joint aspiration or injection in adults: complications. In *UpToDate*, Curtis MR (Ed.), *UpToDate*, Waltham, MA. Accessed 10 Nov 2019.

Further Reading

Cheng J, Abdi S. Complications of joint, tendon, and muscle injections. *Tech Reg Anesth Pain Manag.* 2007;11(3):141–7.