



Joint Aspiration and Injections

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ABSTRACT

Joint injections, both for diagnostic and therapeutic purposes, are a common procedure in rheumatology practice. Diagnostic aspiration is indicated in patients presenting with monoarthritis. Local joint injection therapy (LIT) is an established modality of treatment for the management of inflammatory arthritides, knee osteoarthritis and soft tissue rheumatism. This article briefly outlines the indications, contraindications, technique and complications of joint aspiration and injection.

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INTRODUCTION

A joint injection is done either for obtaining synovial fluid for diagnostic purposes or for instilling pharmacologic agents into the joint. In practical terms, most therapeutic injections into joints, tendon sheaths, trigger points, and periarticular regions consist of a corticosteroid, a local anesthetic, or combinations of the two. Hyaluronic acid derivatives (hylan GF-20 and hyalgan) are also used in selected patients with osteoarthritis. LIT is a very effective way of relieving inflammation in one or more joints.

INDICATIONS

Diagnostic

The most important indication for diagnostic aspiration is acute monoarthritis. A good rule of the thumb is to consider every case of monoarthritis as infection of the joint unless proven otherwise.¹ Urgent aspiration to rule out pus in the joint is warranted because untreated septic arthritis can lead to rapid joint destruction. Apart from septic arthritis, the other common cause of acute monoarthritis is crystal-induced arthritis like gout. Analysis of synovial fluid obtained by joint aspiration is the 'gold standard' for diagnosis of infections or gout. Yet, it is one of the most neglected laboratory tests in clinical practice. The fluid should be subjected to gross examination, total and differential leukocyte count, Gram and Ziehl Neelsen staining, culture, and

crystal studies. Normal synovial fluid has a cell count of <200 WBCs/mm³, mostly mononuclear. A white count of 2000/mm³ is used as a cut-off to differentiate inflammatory from non-inflammatory fluids. A non-inflammatory fluid generally has <50% neutrophils while infected fluids (septic arthritis) has >95% neutrophils. Tests of viscosity, mucin clot, string test are of historical importance only and do not yield reliable or consistent information. Similarly, synovial fluid sugar and protein values, unlike pleural/peritoneal fluids or CSF, have little diagnostic utility.² The value of synovial fluid analysis is limited in patients who present with polyarticular disease.

Therapeutic

Apart from diagnosis, joint and soft tissue injections are also used for therapeutic purposes.^{3,4} Corticosteroids are the most common therapeutic agent injected into a joint. Local steroid injections are used not only for arthritis but also bursitis, tenosynovitis, enthesitis like tennis elbow, plantar fasciitis, and nerve entrapment like carpal tunnel syndrome etc. In rheumatoid arthritis, the major indication of intra-articular steroid injections is one or two recalcitrant joints that are inflamed despite good overall control of the disease. Here, instillation of steroids into the inflamed joint can give relief without having to escalate systemic therapy.⁵ Intra-articular steroid injections are also a safe and effective modality for patients with knee osteoarthritis and effusion (Table 1). Used judiciously, they do not have any significant deleterious effects on anatomical joint structure. Joint injections are also utilized to deliver other agents to the synovium apart from corticosteroids. Hyaluronic acid is used in knee OA (viscosupplementation) and yttrium is employed for radiosynovectomy. The merit-demerits of this are beyond the scope of this article.

Table 1 : Indications and Contra-indications of Local Injection Therapy

Indications	Contra-indications
Inflammatory Synovitis Due To: <ul style="list-style-type: none"> • Rheumatoid arthritis • Psoriatic arthritis • Spondarthritis • Traumatic synovitis • Crystal-induced synovitis Soft-tissue Lesions: <ul style="list-style-type: none"> • Enthesopathy • Tenosynovitis • Bursitis • Epicondylitis (tennis elbow) • Carpal tunnel syndrome • Adhesive capsulitis (frozen shoulder) Osteoarthritis <ul style="list-style-type: none"> • OA with knee effusion • OA of the 1st CMC joint 	<ul style="list-style-type: none"> • Confirmed (or suspected) septic arthritis • Superficial skin infection overlying the joint to be injected • Uncontrolled diabetes mellitus

CONTRAINDICATIONS

The absolute contraindication for LIT would be confirmed or strongly suspected septic arthritis or local infection (Table 1).

PRACTICAL ASPECTS

Space constraints do not permit us to outline the details of injection at each possible joint or site. This is best learnt 'first hand' from a rheumatologist skilled in the technique and then perfected, by regular practice. The European League Against Rheumatism monograph⁶ is a good resource for this purpose. Rheumatologists usually administer joint injections in the outpatient/office setting. While aseptic techniques should be used, injection in operation theatre is not required. The risk of infection after joint injections is low.⁷ In general, the same joint should not be injected more than 3 times/year.⁸ Ultrasound guidance has been used to assist joint injections. Sonographic guidance is particularly useful when fluid collections are small (less than 5 mm) and deep or when the inflammatory process is adjacent to anatomic structures that could be seriously damaged by the injection.⁹ Almost any joint can be injected safely and this can be done as a bed-side/clinic procedure. The hip joint, being a deep-seated joint with adjoining vascular structures, should preferably not be injected without radiological guidance.

The steroid preparations used include methylprednisolone and triamcinolone acetonide/hexacetonide. Doses (for methylprednisolone) vary from 80 mg for large joints such as knee/shoulder; 40mg for medium joints such as ankle/wrist, and 10mg-20mg for small joints such as MCP joints. Patient education is important like in any other procedure. The patient should be advised to 'take it easy' and to rest the injected joint for a few days following the injection. Strapping or immobilising the area or joint is not required.

COMPLICATIONS

Occasionally, local injection therapy may be followed by a transient increase in pain and inflammation at the injection site. This is due to a form of crystal synovitis and termed a post-injection 'flare'. This may be confused with infection. An NSAID for a few days is enough to settle the symptoms, The development of a septic arthritis following LIT is extremely rare (approximately

1 in 30,000 injections). Infection should be suspected if the 'flare' lasts longer than or begins later than 48 hours after the injection. Other findings suggestive of an iatrogenic septic joint include a crescendo pattern of pain, redness or drainage around the injection site, and fever or malaise. Another uncommon complication is leakage of joint fluid. Leakage is particularly likely to occur in two settings: drainage of a popliteal (Baker's) cyst; and aspiration of an interphalangeal joint with a needle that is too large. Rare non-infectious complications of LIT include tendon rupture (if the steroid preparation is injected directly into the tendon), nerve atrophy or necrosis (due to direct injection of steroid), skin atrophy (due to subcutaneous leakage of steroid preparation) and systemic steroid effects (if a number of joints are injected simultaneously, leading to a large cumulative dose of steroid).

CONCLUSIONS

Joint aspiration and injection are firmly entrenched techniques in rheumatology. Most internists, with practice, can adopt and apply these useful techniques for the benefit of their patients.

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