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Intralesional Steroid Injection: General Considerations⁺

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Summary

Local steroid injection is commonly used as an adjunctive therapy in articular disease and soft tissue rheumatism. It may also be used as a bridge for earlier symptomatic relief in inflammatory arthritis, especially rheumatoid arthritis. In this article, we describe some of the general considerations of this procedure. In the next issues, we will describe specific techniques of injection of specific joints and soft tissue rheumatism lesions. (HK Pract 1997;19:425-429)

摘要

局部注射類固醇療法是關節病及軟組織風濕疾病常用的輔助治療方法，可以緩解炎症性關節炎，特別是類風濕關節炎的早期症狀，本文論述運用此療法時需要考慮的一些問題，下期則講述針對不同關節和軟組織的具體注射治療方法。

Introduction

In 1940, Thorn¹ injected 10 mg hydrocortisone into the knee joint of a patient with rheumatoid arthritis (RA). The knee improved locally, but the patient also improved generally and it was concluded that the improvement resulted from systemic absorption of the intra-articularly injected material. No further studies of intra-articular glucocorticoid injections were done until the early 1950s.² In 1961, Hollander and associates³ reported a series of more than 100,000

injections of joints, bursae, or tendon sheaths in 4,000 patients. The researchers called for attention to the usefulness of intralesional glucocorticoids as temporary, palliative, repeatable, local adjunctive treatment for a variety of rheumatic conditions.

Mechanism of action of intralesional glucocorticoids

The anti-inflammatory mechanisms of systemically administered glucocorticoids are still not fully

understood. Even less is known about the mechanisms of intralesional glucocorticoids. After an intralesional injection, a decrease in erythema, swelling, heat and tenderness of the tissues or joints is demonstrated. An increase in viscosity and hyaluronate concentration of the synovial fluid is also observed. In some studies, intralesional injection of glucocorticoid has also been shown to decrease synovial permeability. Although the disease process of arthritis may be suppressed to a major degree, it is rarely "cured" by

⁺ Editor's Note: This article is the first in a series of three articles on local steroid injection for rheumatic disorders.

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the corticosteroid injection. Other conditions like capsulitis, bursitis, or tendinitis may sometimes be "cured" by single injections, but recurrence of symptoms is not uncommon.

Indications of intralesional steroid injections

Intra-articular and soft tissue glucocorticoid injections are considered adjunctive therapy for most rheumatic conditions. When one or few peripheral joints are inflamed or painful from RA, osteoarthritis (OA) or gouty arthritis, glucocorticoid injections may provide palliation and facilitate physical therapy. Common soft tissue rheumatism, for example, bicipital tendinitis, shoulder capsulitis, tennis elbow, de Quervain's disease (stenosing tenosynovitis of the extensor pollicis brevis and abductor pollicis longus) and sometimes trigger fingers can also be treated with intralesional glucocorticoid injections. **Table 1** summarises the common articular and non-articular lesions which may be amenable to local steroid injections.

Precautions and contraindications

Strict adherence to aseptic procedures is required when one is performing intralesional injections. Because of potential tissue atrophy with glucocorticoids, one should use extreme caution when injecting near peripheral nerves. Direct injection of steroid to a nerve may result in necrosis or atrophy.

There are no absolute contraindications for soft tissue injections except concurrent sepsis around the site to be injected. However, more cautions are needed prior to infusing steroid into a joint. It is prudent to exclude local or systemic sepsis. If in doubt, the joint fluid should first be examined for possible infection. Unstable joint, traumatic arthritis

with intra-articular fractures, and severe juxtaarticular osteoporosis are other important contraindications for intra-articular steroid injections. Repeated steroid administration may, in some cases, result in joint instability and should be avoided. **Table 2** shows the major contraindications for intra-articular glucocorticoid injections.

Table 1: Indications of intralesional steroid injections

I. Articular disease:

- Rheumatoid arthritis (juvenile and adult)
- Crystal deposition disease (gout and pseudogout)
- Systemic lupus erythromatosus and mixed connective tissue disease with frank arthritis
- Osteoarthritis
- Shoulder periartthritis (adhesive capsulitis, frozen shoulder)
- Tietze's syndrome

II. Nonarticular disease:

- | | |
|--------------|---|
| Shoulder | <ul style="list-style-type: none"> - bicipital tendinitis - subacromial tendinitis - supraspinatus tendinitis - frozen shoulder |
| Elbow | <ul style="list-style-type: none"> - lateral epicondylitis - "tennis elbow" - medial epicondylitis - "golfer's elbow" - olecranon bursitis |
| Wrist & Hand | <ul style="list-style-type: none"> - ganglion - deQuervain's disease - trigger (snapping) fingers - carpal tunnel syndrome |
| Hip | <ul style="list-style-type: none"> - trochanteric bursitis |
| Knee | <ul style="list-style-type: none"> - prepatellar bursitis and neuritis |
| Pelvis | <ul style="list-style-type: none"> - ischial bursitis - iliopsoas bursitis |
| Back | <ul style="list-style-type: none"> - fibromyalgia trigger points |
| Foot | <ul style="list-style-type: none"> - Achilles tendinitis - Achilles bursitis - calcaneal bursitis |

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Table 2: Contraindications for intra-articular steroid injection

Periarticular sepsis
Bacteraemia
Unstable joints or severe joint destruction
Most spinal joints
Intra-articular fractures
Septic arthritis: Do <i>not</i> forget the possibility of tuberculosis
Nondiartrodial joints e.g. symphysis pubis
Marked juxta-articular osteoporosis
Failure to respond to prior injections
Multiplicity of severe joint inflammation
Bleeding disorders e.g. haemophiliacs

Efficacy of intralesional steroid injections

Appropriately used, most patients show a good response to locally administered glucocorticoids. However, the duration of symptom improvement appears to be related to the preparation used. Methylprednisolone and triamcinolone are the commonest preparations used. **Table 3** shows the list of glucocorticoid preparations available. Dramatic improvement in symptoms usually occurs within 12-24 hours, although responses among patients are extremely varied. Soft tissue inflammatory conditions can be more or less permanently eradicated by judicious injections of steroids. On the other hand, if one or two injections prove ineffective or give only short-lived benefit, there is no logic in persistently injecting the

Table 3: Available glucocorticoid preparations for intralesional administration

Intralesional preparations	Prednisolone equivalents
Betamethasone sodium phosphate and acetate suspension, 6mg/ml	40mg
Dexamethasone sodium phosphate, 4mg/ml	30mg
Dexamethasone acetate, 8mg/ml	80mg
Hydrocortisone acetate, 25mg/ml	5mg
Methylprednisolone acetate, 20, 40, and 80 mg/ml (Depo-Medrol)	25mg, 50mg, and 100mg
Prednisolone terbutate, 20mg/ml	20mg
Triamcinolone acetonide, 10 and 40mg/ml (Kenacort-10 and Kenacort-40)	12.5mg and 50mg
Triamcinolone hexacetonide, 20mg/ml (Aristospan)	25mg

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same joint. A weight-bearing joint should be rested as much as possible after an injection.

Most clinicians will agree with the following dosage (in mg methylprednisolone acetate):

Small joints e.g. interphalangeal joints	4-20 mg
Medium joints e.g. wrist	20-40 mg
Large joints e.g. knees, shoulders, ankles	40-80 mg
Soft tissue rheumatism:	
frozen shoulder	20-40 mg
tennis/golfer's elbow	20-40 mg
bursitis	20-40 mg

It is important to remember not to inject large volume of the agent into a small joint which in themselves can be painful.

General techniques for intralesional steroid injection

Intralesional steroid injection is a safe and simple procedure that can be carried out in the clinic setting. However, a no-touch technique and the use of sterile equipment and aqueous solution are mandatory. Prior to injection, it is important that the patient is reassured and positioned correctly. The objective is to enter the selected injection site and administer the steroid agent with the minimal pain and trauma possible to the structures. The use of local anaesthetics (LA) such as lignocaine prior to infiltration of steroid may be

Table 4: 10-step procedure for intralesional steroid injections

1. Position patient. Palpate the specific area and select an injection site.
2. Mark the skin with firm pressure by the edge of a nail or a ballpoint pen (that has its ink cartridge and point retracted). This will leave a mark for 5-15 minutes.
3. Draw up local anaesthetics and steroid agent. Cap the syringes to ensure sterility.
4. Wash hands and swab the skin with alcohol pads or a sterile solution such as hibitane. Do not touch the skin after swabbing.
5. Use 21-gauge needles for larger joints and 25-gauge needles for smaller joints such as the finger joints.
6. Inject local anaesthetics to the site. Spraying the site with ethyl chloride may be an alternative as the cooling effects of the spray helps to numb the skin.
7. Aspirate any excess fluid (for intra-articular injections). Send fluid for microscopical examination.
8. Take great care not to pull the needle out during changing of the syringe after injection of local anaesthetics or aspiration of fluid.
9. Infuse the steroid preparation into the site. Ensure that there is NO resistance during injection. The procedure MUST be halted and the needle re-positioned if resistance is felt. Pain or paraesthesia remote from the injection site should also call a halt to the procedure.
10. Apply sterile dressing and advise the patient to avoid excessive use of the limb in which the injection has taken place.

Table 5: Potential sequelae of intralesional glucocorticoid injections

1. Post-injection flare
2. Iatrogenic infection-very low incidence
3. Nerve damage
4. Tissue atrophy, fat necrosis, calcification
5. Tendon rupture
6. Pancreatitis- extremely rare
7. Radiological deterioration of joints: Charcot-like arthropathy
8. Posterior subcapsular cataract

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useful as partial relief of symptoms following injection of LA and also confirms that the needle is correctly placed. Additionally, the use of LA may help to prevent post-injection pain which may be a local inflammatory reaction to steroid crystals. Any excess joint fluid should be aspirated and sent for microbiology examination before infiltration of the steroid preparation. **Table 4** shows a step-by-step procedure for intralesional steroid injections.

Potential complications of intralesional steroid injections and recommendations for repeat injections

Table 5 summarises the potential sequelae of intralesional steroid injections. It is important to remember to review the patient in 3-

4 days' time to assess the efficacy or possible complications of the injection.

As for repeat injections, a "rule of 3" is highly recommended. Any lesion should not be injected more than 3 times, and for arthritis conditions, repeat injections should preferably not be given within 3 months. However, for soft tissue rheumatism, it may sometimes be necessary to repeat an injection after 2-4 weeks.

Conclusion

In conclusion, appropriate use of intralesional steroid injection is a good and safe adjunctive therapy for many articular and soft tissue rheumatism disorders. It involves only simple techniques that can be carried out as a bedside procedure by most general practitioners. With care

to avoid sepsis, intralesional steroid injection can be one of the most gratifying procedures for both physicians and patients. Most conditions improve after single treatment although some patients may require to repeat administration of the steroid agent to achieve maximum effects. ■

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