

# Rational for the Intradermal Therapy (Mesotherapy) in Sport Medicine: From Hypothesis to Clinical Practice

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## Abstract

Many athletes, after a trauma, need a rapid therapeutic and rehabilitative solution to get back to sports activities. Many symptoms can limit rehabilitation, such as inflammation, oedema, muscle contraction, and pain. These symptoms can be treated with appropriate therapies. Efficacy and tolerability data have been reported with the application of mesotherapy in many local pain syndromes. Is there a rationale for the use of this technique to manage athletes who need rapid recovery after a sports trauma? For many years it has been believed that the pharmacological action alone was able to explain the clinical effects, recently a hypothesis of a complex “dermal interaction” has been advanced which justifies the use of intradermal therapy even after a sports trauma. Remarks from the Italian Society of Mesotherapy for sports medicine specialists are reported.

## Introduction

Mesotherapy is a pharmacological technique that, through a series of microinjections, allows the inoculation of active principles in the dermis [1]. Drugs injected with this technique reach the underlying tissues at higher concentrations than those obtained with intramuscular administration. Preclinical studies have shown that drug concentration in the skin, muscles and joints underlying the injection site is higher than after intramuscular administration [2-4]. Furthermore, it has been demonstrated [5,6] that the production of antibody response is greater if the antigen is inoculated intradermal with respect to the intramuscular route. Some unpublished clinical results [7,8] confirm that a drug remains longer in the underlying tissues after intradermal injection (up to 2mm) than in the deeper injection (greater than 10mm). Similar results have been demonstrated in patients with the administration of human follicle stimulating hormone (rhFSH) injected at a depth of 1-2mm compared to the deeper administration (10-13mm) [9]. These data suggest that the skin constitutes a “deposit” that modulates the spread of drugs in the underlying tissues with the potential advantages of a lower dose requirement and a lower risk of systemic interactions [1]. Furthermore, the micro-trauma induced by the needle and distension of the skin tissues due to the injected liquid would stimulate the reactions of the reflex nerves with an activation of the gate control [10]. Also, the chemical-physical properties of the injected liquid can induce some local reactions [11,12]. Finally, a glial dermal network able to actively participate in the regulation of local pain, could be involved [13]. All these data suggest that intradermal therapy is the result of a series of “meso-dermal reactions” partly due to the pharmacological effect but enhanced by other intradermal mechanisms.

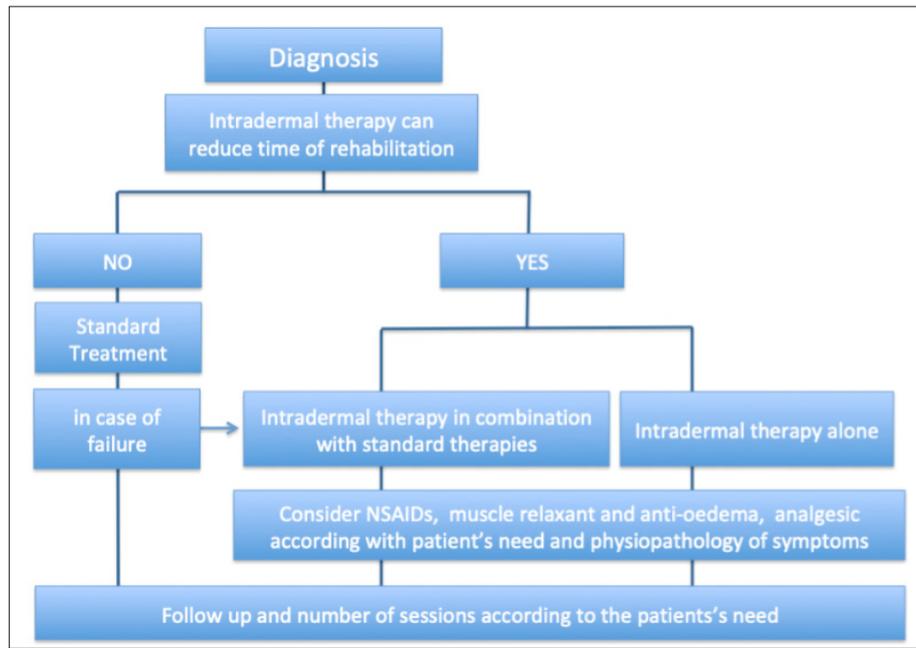
This hypothesis would be the basis of the short- and medium-term analgesic effects reported in real practice [14,15]. Intradermal therapy is a medical technique that can be practiced, both to reduce acute symptoms and to facilitate post-traumatic rehabilitation, alone or in combination with standard therapies. Some experimental data indicate that intradermal therapy in acute localized pain allows results comparable to oral or intramuscular systemic therapy [16-18]. Even when localized acute pain required intervention in an emergency room, intradermal therapy achieved results that were no less than intravenous administration [19].

These data suggest an advantage in terms of lower pharmacological systemic interactions for less use of local drugs.

Obviously, the injected drugs must be selected based on the pathophysiology of the symptom (inflammation, oedema, pain, muscle contraction), and based on the patient's trauma (tightness, strain, tear, rupture) (Figure 1). In any case, the sport specialist must obtain the patient's informed consent to apply intradermal

therapy and also to share treatment and rehabilitation plan. For this purpose, the Italian society of mesotherapy has validated an information sheet to facilitate communication between doctor and patient to share the benefits and limits of this technique

<https://www.societadimesoterapia.it/images/foglio-informativo-sim-2019.pdf>



**Figure 1:** Mesotherapy's Algorithm for sports trauma.

The figure shows the proposed algorithm treatment with intradermal therapy. The informed consent must be collected before applying the therapy

## Conclusion

In many countries of the world, various localized pain syndromes are treated with intradermal therapy, both to reduce healing time and to reduce the risk of systemic drug interactions. Of course, additional randomized clinical trials are needed to compare the utility of mesotherapy with standard therapies or in combination with them in sports trauma. However, the beneficial potential of intradermal therapy could become a standard resource to help athletes recover efficiently after a trauma. The potential benefit of intradermal therapy plays a role both as a model for clinical research and the study of the intradermal effects of many drugs used today (muscle relaxants, anti-inflammatories drugs, vasodilators, analgesics, anaesthetics, phlebotropics) and also to help athletes recover efficiently after a trauma. If the pharmacological mechanism is assisted by reflexological mechanisms, local chemical-physical effects and their interactions with dermal nerve centres, the recommendations of the Italian Mesotherapy society to use a single drug rather than mixtures of drugs to reduce symptoms appear even more convincing. The choice of therapy must be based on the diagnosis, the physiopathological nature of the damage and the characteristics of the individual athlete. A personalized medicine is an indispensable criterion for applying the intradermal-therapy (mesotherapy) in the field of sports medicine.

## Disclosure

The authors declare that they have not conflicted with the content of the article. No fees were received for the preparation of the article. All authors agree with the content.

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