



Historical Background



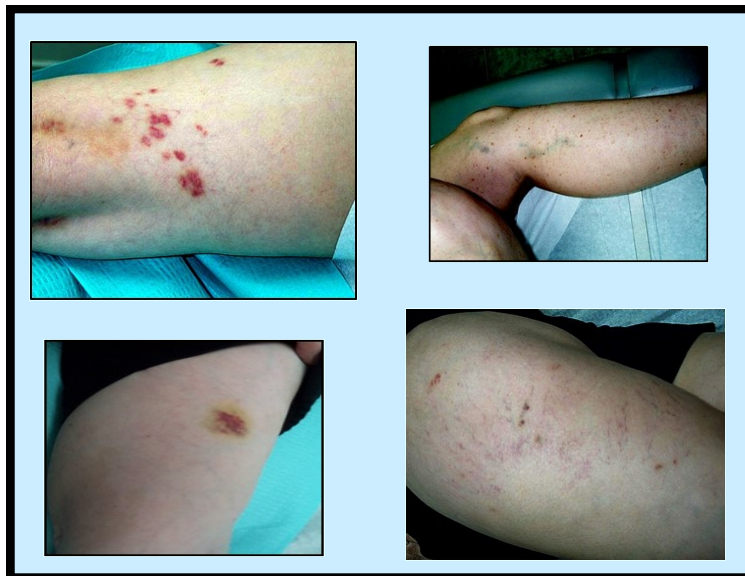
Pravaz, the inventor of the silver syringe, used iron perchloride in 1830 to cause a sclerosis of the venous system by injecting this substance for treating arterial aneurysms. Phenol, alcohol and iodine solutions were subsequently used for sclerosing varicose veins. This practice was abandoned, however, due to its many side effects, including necrosis of the vascular wall, kidney lesions, embolism, and shock.



Treating Sclerotherapy Complications

Objectives of this Chapter:

- Identifying complications that may arise in sclerotherapy.
- Finding out the causes and complications of side effects.
- Becoming familiar with the treatment of the most common complications in sclerotherapy.
- Determining preventive measures to avoid the complications of sclerotherapy.



List of Sclerotherapy Complications

In experienced hands, and with the appropriate training, sclerotherapy complications can be kept to a minimum. That is why good training is critical.

At Crown Medical, according to different studies, we have obtained the lowest rate of expected complications. We believe that the right training and techniques will definitely allow you to limit the likelihood of side effects to 1-1.5 percent of your patients. Fortunately, even within that small percentage, the most frequent complications are the least lethal ones.

According to medical records, back when sclerotherapy techniques started to become popular, there was a relatively high rate of complications such as necrosis and pulmonary thromboembolisms.

Today, with improvements in sclerosing agents along with progress in terms of techniques and vascular tests, these percentages have changed radically for the benefit of professionals and patients.

A detailed knowledge of complications in sclerotherapy and its treatment is critical for any health professional involved in the performance of these procedures.

You should be able to answer the following questions:

1. What elements of the therapy may cause complications?
2. When can complications arise?
3. Why do complications occur?
4. How can they be avoided?
5. How are complications treated?

This is one of the chapter objectives to be developed below.

While reviewing this chapter you might harbor some fears or doubts about the benefits of this procedure or the challenges faced by sclerotherapy. But there is no reason to fear. We have successfully provided sclerotherapy services for many years, delivering a great benefit to our patients.

You will be able to see the results of our humble efforts after 25 years of performing only sclerotherapy. This specialization has provided us an opportunity to develop a therapeutic and methodological system that can meet most needs in terms of side effects and possible complications of sclerotherapy.

Treating Sclerotherapy Complications

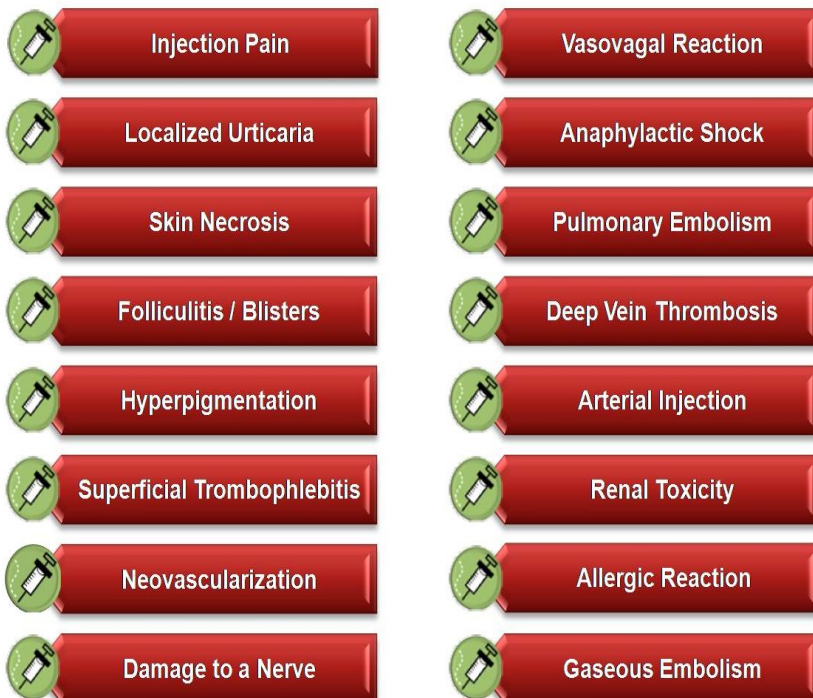
We put at your disposal our many years of research and the expertise gathered during those years.

Still, you should be ready for the unexpected and the unpredictable. Medicine is an art. In our specialty, you sometimes find that two plus two does not equal four.

We know as health professionals that being cautious and careful is the path that leads to excellent results.

What complications may arise in Sclerotherapy?

Sclerotherapy Complications



Treatment for Each Complication

Complications are grouped according to their scope as:

- **Localized Reactions**
- **Systemic Reactions**

Localized reactions occur in a specific area, generally the treatment area, or are limited to only one or both lower limbs. Systemic reactions, in turn, reach much farther than the injection area, as their name indicates, and can be much more serious.

Let us now look at each of the side reactions mentioned in the above chart or figure. These are the most common reactions you will come across when performing sclerotherapy.

Pain

Pain may prevent a treatment plan from succeeding, especially when multiple therapy sessions are needed.

We are not referring in this case to the pain reported by most patients when their skin is punctured with a hypodermic needle. We are referring to the pain a patient describes as burning and persistent. It is important to be able to make this differentiation.

Persistent pain is a sign of alert when the sclerosant is extravasated. The consequences of extravasation may be serious. On the other hand, pain may be a preventative tool for other lesser and greater complications.

If extravasation is suspected, follow the procedure below:

Solution

1. Inject bacteriostatic water or hyaluronic acid into the subcutaneous cell tissue in order to dissolve the solution. This will make the pain go away and will prevent necrosis.
2. Massage vigorously in order to stimulate circulation.
3. Do not use compression bandages that could reduce circulation in the area.

The difference between injection pain and pain from extravasation has to do with how long the pain lasts. In the former, the painful feeling goes away almost instantly after withdrawing the syringe and massaging the skin. In the latter, the pain lasts until necrosis ensues.

Pain in Sensitive Areas

Another relevant comment is that some areas, such as the ankles, feet and medial areas of the thighs are potentially more painful than others. The ankles are the most sensitive of all.

Solution

- Use topical anesthetics if there is no contraindication.
- Limit the number of injections in the area in order to minimize the irritation.

Pain caused by the Type of Medication Used

The type of solution used will have an impact on the level of pain tolerance of the patient. For example, hypertonic solutions cause more pain in the injection area.

Each type of medication produces a different sensitivity in the patient. Such is the case with sodium morruate, which is more viscous and therefore makes the feeling of pain last longer.

Solution

- Use a needle with a smaller diameter in order to minimize the pain.
- Inject slowly in order to produce a slow distension of the tissue and, as a consequence, lesser perivascular nerve stimulation.
- Inject 0.1 ml or less per site and immediately massage the area.
- Another way of dealing with injection pain is to add 2 percent lidocaine to the sclerosing agent.
- You must exercise caution when making this combination, as there is a possibility of causing pain because of injecting the

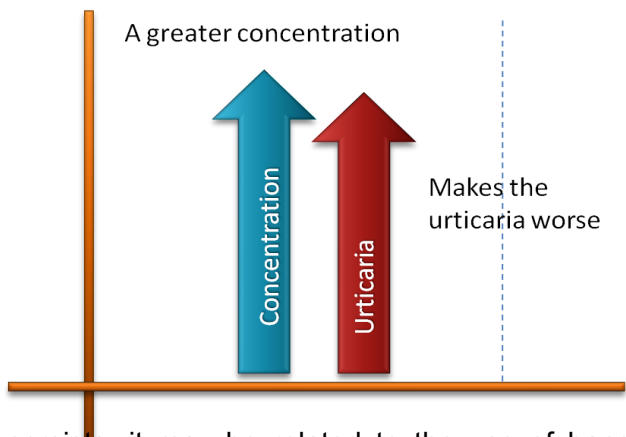
anesthetic as well as due to its allergic reactions. This might also increase the likelihood of ecchymosis, bruises and heart arrhythmias (irregular heartbeat).

Rather than a complication, this is an early reaction as a result of endothelial irritation, which causes the mast cells surrounding the blood vessel to release histamine.

Localized Urticaria

Urticaria usually goes away in approximately 30 minutes and may cause itching afterward. It often affects patients who have dermographism.

Urticaria increases in intensity the more concentrated the sclerosing agent is.



If urticaria persists, it may be related to the use of bandages, hosiery, antibiotic creams, anesthetics and anti-coagulants. These would need to be dispensed with.

Solution

Tell the patient that localized urticaria is normal and that, if he or she experiences itching later, he or she may apply topical Diphenhydramine, which does not require a prescription.

Topical steroids, such as Clobetasol, may be applied if necessary in order to quickly reduce the production of histamine, which causes itching. As a side effect, they also cause vasoconstriction which contributes to the resolution of the blood vessel. This is also helpful when the patient needs to wear graded hosiery after the sclerotherapy.

Lo-

Localized Urticaria



Localized Hirsutism

Hypertrichosis is very rare and bears no relationship with any specific sclerosant. It is caused by factors that contribute to hair growth, such as an improved oxygenation of the tissue and increased vascularity due to the swelling caused in the vascular endothelium.

In clinical practice, hirsutism is reported in patients with chronic venous insufficiency after surgical treatment.

We may conclude that it is not the treatment itself that causes it, but what results from swelling and changes in microcirculation.

Skin Necrosis

When the sclerosant spills out of the blood vessel, it acts as a caustic agent, even when the agent is used in a low concentration. Necrosis may ensue even under ideal circumstances and it does not necessarily entail a medical error. It is a consequence of extravasation of the sclerosant in the perivascular tissue, of injection of an arteriole, of reactive vasospasm and excessive pressure when applying compression techniques.

ETIOLOGY

- **Arteriolar injection:** It happens when a large volume of sclerosant is quickly injected in telangiectasias, forcing the solution into arterial circulation.
- **Vasospasm:** Although rarely observed, it involves the appearance of a whitish macula after the injection of a sclerosing agent. This reaction may be due to an arterial spasm that takes place in individuals who are predisposed because of unknown causes.
- **Excessive compression:** It produces anoxia with subsequent ulceration when pressures exceed 30 mmHg, or even with a pressure of 15 to 20 mmHg in our experience. We prefer venous emptying, facilitating contact between the irritated blood vessel walls without causing hypoxia.
- **Extravasation:** The mechanisms that cause it are:
 - a) Perforation of a varicose vein at several puncture points.
 - b) Extravasation of the sclerosant when the syringe is withdrawn.
 - c) Extravasation of the sclerosant into the injection point.
 - d) Extravasation because the needle bevel is not completely inside the varicose vein.

