Using a cannula for dermal filler

Dr Giulia D'Anna

By Dr Giulia D'Anna, BDSc, MRACDS, Grad. Dip. Derm. Th
Cert IV TAE, Grad. Cert laser

No matter how experienced you are in the use of cosmetic injections, every practitioner should be aiming to prevent, avoid and manage complications when treating patients. This is particularly the case when using dermal filler.It is difficult to know exactly how many adverse events occur in Australia every year as a result of dermal filler, but we do know that many can take place. The most common complications following dermal filler are swelling and bruising.

Whilst these are 'annoying', they are certainly not debilitating long term. A much more serious complication is vascular compromise, which can quickly become a medical emergency. So let's look at what a vascular compromise actually is, how to avoid it and how to treat it.

Vascular compromise or occlusion

Vascular compromise is also known as an arterial or vascular occlusion. This is where there is a changed blood supply to an area of the face as a result of a blockage or reduced blood flow to the skin and tissues.

Vascular compromise is usually seen very early on post-treatment, occurring within 24 hours of hyaluronic acid injection.

Vascular compromise is caused by injection of the filler onto an artery of the face, preventing arterial or oxygenated blood from flowing onto the tissue it supplies. The patient will usually experience pain which is severe in nature, and the tissues that are becoming hypoxic turn white or blue in colour.

Vascular compromise can occur via two main mechanisms.

1. Dermal filler can be injected directly into the blood vessels, blocking the flow of oxygenated blood. As an artery passes through to the terminal vessels, the vessel goes from being large diameter to a much smaller size at its end. This forms a filler 'plug' that overwhelms the blood pressure, stopping it from flowing.
2. Compression of the vessel, where a large volume of filler is placed over the vessel, reducing the flow of blood significantly to the tissues.

Stages of Vascular Occlusion (VO)

Briefly, there are 5 stages of vascular occlusion. Every cosmetic injector should be aware of these, as this is a time critical event. The stages of vascular occlusion are:

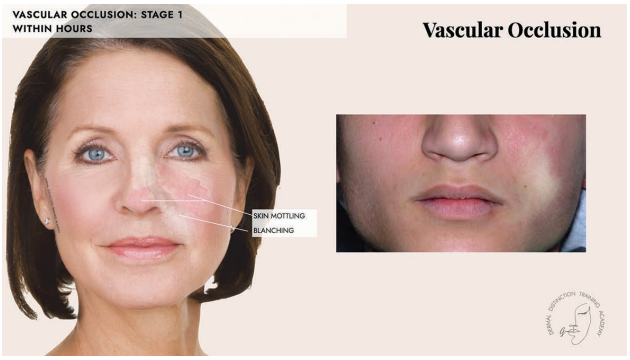
Stage 1:
Pain

Severe pain is usually experienced by the patient at the time of injection. However, if local anaesthetic has been used (either topically, a nerve block, or administered with the product) this symptom can be less reliable. Extraordinary pain is not a feature of soft tissue filler treatments, and if a patient complains of sudden or escalating pain during treatment or in the hours following treatment, this should alert the practitioner to the possibility that a vascular occlusion has occurred and warrants an urgent review. Injectors should be aware that pain distant from the injection area can also be a warning sign of vascular occlusion.

Blanching

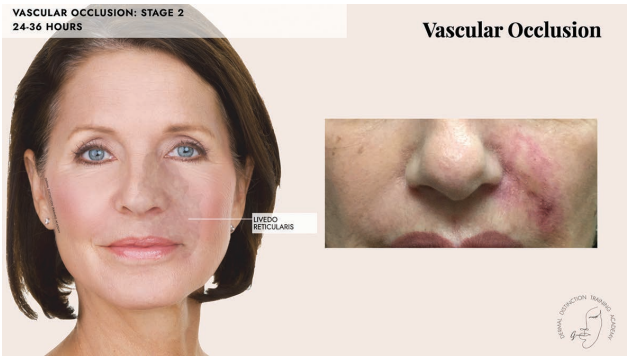
When the vasculature is affected, the area will often initially look pale, white, or dusky, due to the reduction in blood supply to the affected tissue. This colour will remain after removal of the needle or cannula.

The blanching might initially be transient and local, but if unresolved, the pattern of the blanching will become reticulated or irregular, following the same path as the blood supply that has been restricted. This blanching might be masked initially, if adrenaline or certain topical anaesthetics have been used.



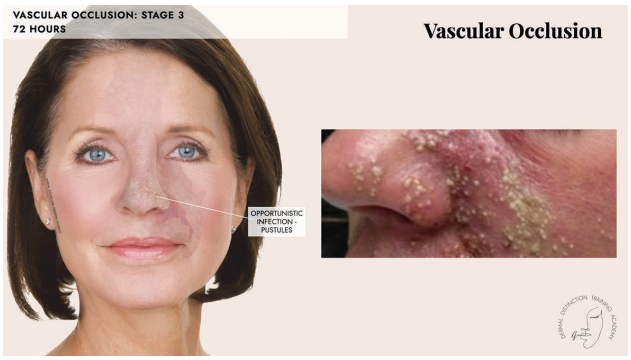
Stage 2:
Dusky, purple discoloration

This is more typical several hours following treatment and is due to the accumulation of deoxygenated blood in the affected tissues. The appearance can mimic that of bruising, but bruises do not blanch, as they are caused by blood leaking into the skin.

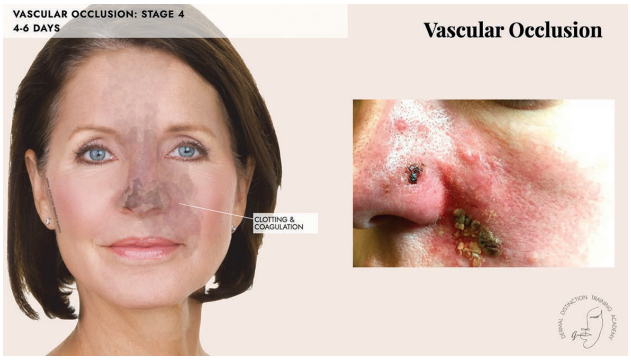


Stage 3:
Skin Breakdown

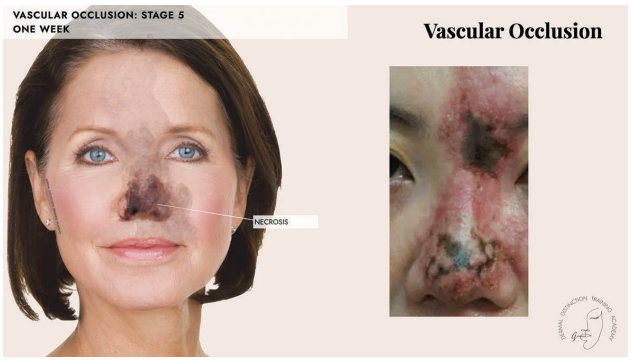
Opportunistic infection with anaerobic infection predominates due to lack of oxygen in the tissues. Antibiotics that target anaerobes needs to be considered as a treatment after Hyalase has been performed. This is the final stage that a cosmetic injector can rectify the blood supply and the patient should make a full recovery without surgical intervention.



Stage 4:
Clotting and coagulation
The blood that has pooled will clot and the tissues will try to repair the necrotic tissues. Scar tissue will result due to the impaired vessels and blood flow. Once the vascular occlusion reaches this stage, a surgeon will need to be involved to rectify the skin necrosis, removing necrotic tissue. The patient will also be left with a permanent aesthetic injury. The patient is now in real trouble, and will need surgical intervention to debride the tissues to control the tissue healing.



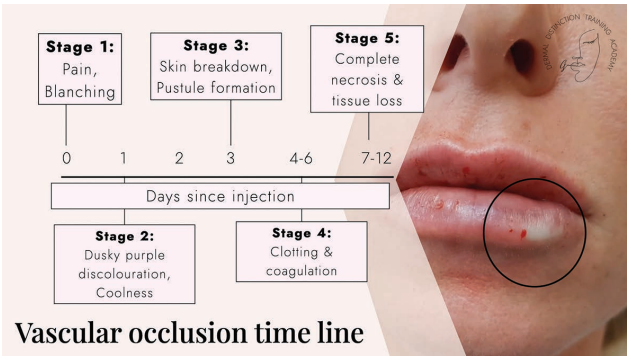
Stage 5
Complete necrosis and tissue loss.
Due to the end stage of tissue necrosis and loss, the tissues will be lost. Scar tissue is profound and re-establishing the blood flow will require a multi-disciplinary team.



How to prevent a vascular complication

As we all know, prevention of a problem is better than dealing with it. Recognising a VO and what stage it is at is also important and intervening early. So let's look at the possible strategies for prevention.

Having a deep understanding of the anatomy is fundamental to cosmetic injecting. Knowing what layer to place dermal filler not only provides a great aesthetic outcome, but also a safer experience for both the practitioner and the patient. This is especially important when injecting anywhere near the facial, nasal, temporal and ophthalmic arteries, as well as other areas of the face that are connected to these vessels, such as the nasolabial fold. A detailed history for the patient, including previous facial injuries and trauma is also very important to consider.



The technique is the foundation to safer cosmetic injecting. The cosmetic practitioner should use very small aliquots of dermal filler in any area, and also inject using very light pressure. This is important so that the blood pressure is not overcome with the filler material, should it be inadvertently injected intravascularly.

Another important point is to constantly move the tip of your needle or cannula. This ensures that the filler is distributed in an area, rather than a bolus being injected into or over the vessel in one place.

Finally the injection method is also really important. **A global consensus group determined in 2016, that an important strategy to minimise and avoid complications was to use a cannula, and this should be part of your cosmetic 'tool kit'.** When injecting my patients, and when educating practitioners through Dermal Distinction Training Academy, I use a cannula to deliver dermal filler 99% of the time. The cannula should have a blunt round end, with a side port. I prefer a cannula no longer than 50mm so that I can control the cannula depth and direction. It is also important to select a cannula that is 25 gauge or larger. For thicker dermal filler, I will use a 22 or 23 gauge cannula. If using a cannula that is 27 gauge or smaller, the cannula acts just like a needle, and offers little safety over a needle.

When using a cannula, it is also important for the cosmetic practitioner to know where the cannula is at all time (depth and direction), move the cannula whilst injecting 100% of the time, and to gain consent from your patient. A cannula is considered an 'off-label' delivery of dermal filler, and the patient must consent to the use.

I include this in my consenting protocol and my consent forms when I am consulting with a patient. If you are not using a cannula to deliver dermal filler, you must consider training in this treatment protocol as a medical and dental safety minimum.

Finally, every clinic must have Hyalase on-site. It is recommended that you have a minimum of 5 vials available. If you are not sure if the area is bruised or has a Vascular Occlusion (VO), assume it is a VO and Hyalase the area immediately.

The cannula design

The word 'cannula' comes from Latin, meaning 'little reed.' Essentially, a cannula is a flexible tube that can be inserted into a bodily cavity, duct, or vessel to administer or remove fluid. The

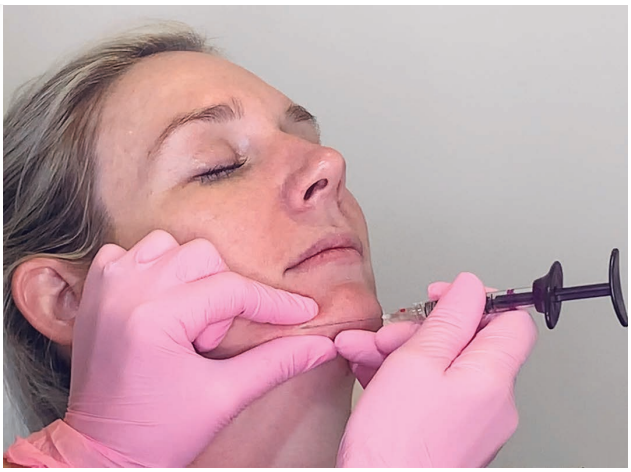
Cannula has been used for various applications in medicine for more than a hundred years, most frequently for intravenous therapy. Today it is the medical and dental standard for dermal filler treatment.

It is designed without a cutting edge, therefore cannulae require a portal before they are introduced into the soft tissue. A pilot or "introducer" needle is used for the initial skin penetration. The pilot needle is inserted in a 30° to 45° angle to the skin and directed in what will be the desired cannula path. The depth of needle insertion should be to the depth that you would like the cannula to pass. If you are aiming at the periosteum, the needle should pass to the periosteum. If you are hoping to pass the cannula to sub-cutaneous plane, the introducer needle should also pass to the sub-cutaneous plane.

Like choice of filler, the use of needle versus cannula depends on practitioner preference. The Cannula allows for injection of the entire lip using fewer injections, potentially reducing the incidence of local side effects.

Many studies have found that blunt-tipped cannulas were associated with significantly less pain, bruising, and ecchymosis compared to 27G needles when used for filler injections in the lips.

As mentioned already, there is a global concensus for the use of the cannula for dermal filler of at least a 25 gauge or larger device, to reduce the incidence of cannulating a blood vessel. This therefore reduces the incidence of vascular occlusion and blindness.



Cannula offers some technical advantages over traditional needles. The ability to deliver broad, multidirectional threads and aliquots of filler with fewer needle insertion sites is a distinct benefit. This means one entry point can deliver filler to a very broad and large 360 degree area, causing less pain, swelling and incidence of complications. ◆

To learn more about prevention strategies, and to train in the use of a cannula, head over to www.dermaldistinction.com

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Learn to use a Cannula for safer injecting

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+ Small Training groups
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DERMAL DISTINCTION TRAINING ACADEMY
www.dermaldistinction.com
3 Belmore Road, Balwyn North 3104
(03) 9859 7859