Aesthetics
The monthly journal for medical aesthetic professionals
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Dr John Quinn addresses the complications that can occur when treating patients with dermal fillers

Filler complications

Complications are, unfortunately, inherent to any medical procedure. When they occur in the NHS, there is a degree of understanding amongst patients and medical professionals. In the private sector where cosmetic medicine exists, complications are less accepted and there is a propensity for the incident to become a story in a daily newspaper. With so much of our education being sponsored by drug companies, complications have previously been glossed over and many of us have personal experience of insufficient or no support at all in the event of a poor outcome.

General considerations

There are some simple steps that a practitioner can take to reduce the risk of complications. My personal view is that dermal filler procedures should be done in a regulated healthcare setting, ideally a Care Quality Commission regulated clinic. Adherence to aseptic and 'no touch' techniques is essential. The importance of hand washing cannot be overstated. I use a sterile pack, swabs and gloves for each procedure I perform. I cleanse skin with chlorhexidine. There is evidence that this provides better, more prolonged anti-microbial action than with alcohol.[1] Either way, I advise using an additional substance other than the one you use to remove the patient's makeup. I personally use multiple needles or cannulas per procedure, and this is of particular importance with deep, volumising injections. On training days, I frequently see practitioners touch or wipe their needle with a swab before injection. This is not sensible and should be avoided. If I touch my glove with a cannula, I change the cannula. In terms of injection technique, go slowly and inject small amounts per injection point. Slow injections are less uncomfortable for the patient and reduce the risk of bruising and swelling and will likely make late complications less frequent.[2] After the procedure, I have my patients apply some alcohol gel to their hands, instruct them not to rub their face and, ideally, avoid makeup for the rest of the day. If they must apply make up (I am a realist!), then I ask them to make sure that it is brand new and therefore does not harbor any bacteria.

Early complications

Early complications – within a few days of the procedure – are generally related to the physical act of injection itself. Bruising and swelling may be seen as side effects rather than as complications. I consider them a complication if the patient has to avoid social events. This is somewhat arbitrary, as patients will obviously differ. To reduce the risk of bruising and swelling, I try to use the smallest needle possible and, in danger areas, I choose a blunt tipped micro cannula to place my product. An awareness of vascular anatomy aids in locating where large vessels may sit and is important, but in reality there is considerable variation. The facial artery runs a tortuous course just lateral to the nasolabial fold, where it changes its name to the angular artery. The angular vein is a small vein near the eye. It is formed by the junction of the frontal vein and supraorbital vein, runs obliquely downward, on the side of the root of the nose, to the level of the lower margin of the eye socket, where it becomes the anterior facial vein. Branches of the facial vein frequently run along the marionette fold and this is a very common area for noticeable bruising, in my experience. For this reason, this is an area where I almost exclusively use a cannula. When augmenting the lip, it is important to remember that the labial artery runs deep in the body of the lip. Thus injection on the wet dry border is likely to bruise.

Usually, swelling will settle within a few days. Certain products tend to swell more, related to their hygroscopic properties.[3] The lips are a particularly common place to see noticeable swelling, and therefore I warn patients of this. My standard practice is to use no more than 1ml in an initial lip enhancement, and I frequently use a 0.5ml syringe. My experience is that patients often prefer their lips when swollen. I then retreat the area, at least two weeks later. Using an ice pack post procedure is sensible and oral steroids for early swelling are sometimes used. However, bruising is hard to predict. I try to ensure that my patients have no major social engagements for a week post procedure. When severe bruising occurs, it is possible to hasten the resolution by use of a vascular laser. This has been looked at using a pulsed dye laser[4] but I have also had some success in my clinic using my Lumenis One IPL.

The most catastrophic potential complication is intravascular injection of filler, leading to tissue necrosis and potential scarring. This is not an issue that was spoken about on any early dermal filler course that I attended. A sound knowledge of the surface anatomy is essential when injecting dermal fillers. However, as previously mentioned, there is very considerable variation and so awareness of the danger areas and some simple tips can reduce your risk.

The most common problem areas are the glabella, the nasolabial folds and the nose.[5] The glabella is an issue because the supratrochlear and supra orbital arteries, both branches of the internal carotid artery system, are end arteries. This means that there is little collateral circulation in the event of cannulation and inadvertent injection. There is also little distance between the skin and periosteum of the frontal bone in this area. The patients with the deepest frown lines are the patients most at risk. These are the very patients who are often less impressed with initial toxin treatment and thus request fillers. My practice is to try and identify these patients pre treatment. I communicate to these patients that their static lines will improve but will not be eradicated by one toxin treatment. The use of photographic documentation is extremely important here, and is a practice that should be applied to all aesthetic procedures. I tell these patients that their lines will improve on repeated treatment as per the original FDA approval study for Botox in the USA demonstrated. If the patient remains unhappy after three treatments, then filling only becomes easier as the glabellar lines will be less deep after treatment with toxin. It is also possible to create a problem by compression of the glabellar arteries, as well as by cannulation and embolisation.[6] This is again because of there being little space between the skin and periosteum in this area. These patients will later present with signs of necrosis, a point discussed later in this article.

The nasolabial fold is one of the first areas that we learn to inject as cosmetic practitioners. As previously mentioned, the facial artery, a branch of the external carotid artery, runs a tortuous course, usually just lateral to the fold. It gives off labial branches, upper and lower, just lateral to the oral commissure. At the base of the nasolabial fold, the nasal ala, there is frequently a branch that passes medially.

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Date of preparation: April 2014 UK/SIPPER/14/0003

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Inadvertent injection into this artery can potentially cause embolism and produce an infarction affecting the nose.[7] It is also possible to compress the artery. As with the glabella, this will tend to present slightly later. I always warn my patients that pain is not normal post fillers, and to call the clinic if they have any concerns. An emergency contact number is essential.

Recently, nose reshaping has become a not uncommon procedure. My personal opinion is that this should be done by specialists, and not by a practitioner following a one-day course. Nasal tip necrosis can occur post fillers; this relates to the compression of vessels in the area.[8] Proximal embolisation can occur, particularly at the nasal bone, which can cause permanent blindness.[9] Practical considerations include injecting slowly and to constantly move the tip of the needle. Avoid bolus injections in these areas. I have seen some practitioners advocate aspiration but I have never felt dexterous enough to be positive that my needle tip stays in the exact same position post aspiration. Also, although it may be possible, I don't think that it is easy to withdraw blood with a 30g needle. Despite this, I always aspirate when injecting a bolus. I tend to do this in the midface only. In this situation I use a 27G needle, advancing towards the periosteum. I steady my syringe with my left hand and aspirate. I inject very slowly and tend to avoid any more than 0.2ml of product per site. I am always watching for signs of arterial compromise, namely; pain and pallor. If the catastrophic event of vascular compromise is apparent, treatment includes massage, heat, topical GTN (if available) and hyaluronidase. If arterial emobilisation has occurred, then hyaluronidase is unlikely to be of great benefit, but I would still advocate its use. Early referral to a plastic surgeon is essential. Superficial areas of necrosis may heal well but appropriate wound care is paramount. I would not patch test in this situation – it is an emergency.

Blindness post dermal fillers has been reported in the literature in recent years.[9] In reality, most of the cases have been related to fat injections but it is possible with most materials. The bulk of the arterial supply of the face comes from the external carotid artery system. The exceptions are, as previously mentioned, the arteries of the glabella, supratrochlear and supraorbital. These emerge from the orbit as branches of the internal carotid artery. They thus communicate with the retinal artery. There are multiple anastomoses between the external and internal carotid systems in the areas of the base of the nose, the temple and even the tear trough. These are all areas where I urge extreme caution.

Infection is a risk post implantation of any medical device. Fillers are no exception. Increasing tenderness or erythema are signs and patients should be warned of this. Prompt intervention with bacteriocidal antibiotics is essential. Sensible options are macrolide antibiotics such as clartihromycin 500mg bd or ciprofloxacin 750mg bd. Treatment is for two weeks, at least.

Medium term complications

After a few weeks, hyaluronic acid fillers should be integrated into the host dermis. Palpability of product at this stage is possible but may indicate a problem. Over injection into an area can produce palpable nodules. These may simply be massaged if they are small and not inflamed. Any sign of infection should prompt early treatment with antibiotics. Hyaluronidase may be used to dissolve hyaluronic acid filler if it is visible or unacceptable from a cosmetic point of view. Common areas that I am asked to treat include the lip, the tear trough and cheeks. Injections into the body of the lip frequently lead to unevenness. Presumably muscular contraction of orbicularis oris compounds this problem and collects the product into pockets. It may simply be injection related also. Bluish discolouration can occur with any HA filler. This tyndall effect is related to refraction of light off the HA particles. I have seen this with all the fillers that I use, apart from Belotero.[10] I now use this as my first line product for superficial injections. The discolouration can last for years, long past when one would expect the filler to have been degraded by the patient. My experience has been that the more superficial the filler is placed, the longer it tends to last. I have used hyaluronidase several years after implantation and resolved the tyndall effect in a number of referred patients. Most recently, I saw a patient with swelling under her right eye, which she'd had for four years. Her practitioner had told her that she was allergic to the filler. After three sessions with hyaluronidase, she felt happy to be photographed on holiday again.

When using hyaluronidase, it is important to discuss with the patient that it is unlicensed for dissolving filler. It is an animal product so there is a risk of hypersensitivity. There is debate, but standard practice is to patch test on the forearm before injecting into the face. Hyalase is a commercially available product in the UK. It comes in 1500 iu vials and is used mainly in anesthesia. To dissolve HA filler, 10-15 units are usually sufficient per 0.1ml of HA. I add 1.5ml to the vial, then withdraw 0.1ml and draw this up to 1ml. This gives me 10 units of hyalase per 0.1ml. I allow 24 hours between patch test and treatment. I tend to start with small amounts as there have been reports of the product dissolving the patient's innate HA.[11] I haven't seen this in my practice however. Repeated treatments may sensitise the patient, so I try to do what is required within a small number of treatments. I always have hyalase in my clinic in case of an emergency, as discussed previously. This is crucial to have on-hand, in my opinion.

Late complications

Thankfully the risk of late reaction to commercially available non-permanent fillers is very low.[12] There is really no reason to use permanent fillers in my opinion. Apart from the difficulty in removing them, should there be a problem, the fact that facial ageing is a dynamic process means that anything permanent may not be as aesthetically attractive several years later.

It is increasingly recognised that late reactions to dermal filler are related to low-grade infections known as biofilms.[13] These entities are well known in medicine and dentistry. They consist

of aggregations of, usually, relatively low pathogenic bacteria, collected onto a matrix of implanted material. The foreign body acts as an anchor for colonisation and subsequent secretion of protective polysaccharides. This shields them from antibiotic treatment. Patients presenting with late nodules should be empirically treated with high dose bacteriocidal antibiotics. Otherwise the biofilm becomes more resistant and difficult to eradicate. It is often required to remove the implanted material for resolution of the problem. This is why, now, I only use hyaluronic acid fillers for facial revolumisation.

In my practice, I have seen two cases that I have treated as biofilm. Both presented several months after cheek enhancement with slight swelling and discomfort in the treated areas. I prescribed clarithromycin 500mg bd for 4 weeks and used hyaluronidase while on antibiotic cover. Both settled on this regime. Dr K De Boulle from Belgium has suggested using ciprofloxacin 750mg bd for one month in the first instance.[14] There is a risk of tendonopathy with this so patients must be warned against vigorous physical activity. Others have advocated using dual therapy. Either way, a prolonged course of high dose antibiotics is indicated.

Given the trend for deep volumising injections and the variation in training/ability and inappropriate venues for treatment, there is, unfortunately, every likelihood, that we will see an increase in these biofilm reactions in the future. As discussed, complications are sometimes inevitable, but taking a stringent approach to technique and delivery will ensure that any unnecessary complication in an aesthetic procedure is avoided.

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