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THE TECHNICIAN'S ROLE IN INTRAVITREAL TRIAMCINOLONE ACETONIDE INJECTIONS

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INTRODUCTION:

Intravitreal triamcinolone acetonide (IVTA) injections are being done more often in the eye clinic. The technician's attention to detail while preparing the patient and the injection is critical; but his or her role begins long before the actual injection, and extends into the follow up period as well. The technician offers valuable assistance to the surgeon, which results in an organized and efficient procedure. In turn, the patient benefits from the most that can be done for a successful outcome.

OBJECTIVES:

Upon completion of this article the reader should:

- Be able to name three conditions in which IVTA injections are being used to treat
- Specify surgical instruments and drugs that could be included in an "IVTA Kit"
- Describe the ways in which a technician can make a patient having IVTA more comfortable
- Describe the steps in an IVTA procedure
- Describe what information a patient should be given as they leave the office after an IVTA procedure

Intravitreal triamcinolone acetonide (IVTA) injections are becoming increasingly common in the retina clinic as its benefits are becoming more apparent. Clinical trials have shown IVTA effective in reducing macular edema due to diabetic retinopathy and central retinal and branch retinal vein occlusions.^{1,2,3,4} More recently, it is finding favor as an adjunct therapy to photodynamic therapy (PDT) with verteporfin (Visudyne--Novartis Ophthalmics; East Hanover, NJ) for treatment of age related macular degeneration (ARMD) with choroidal neovascular membrane.⁵

Corticosteroid use in ophthalmology has typically been in the form of eyedrops and peribulbar or subtenon injection. However, the drug level to the retina and vitreous is inadequate when administered in these ways. Oral prednisone is capable of delivering effective levels of intraocular steroids, though systemic side effects tend to outweigh the benefits.² Corticosteroids have anti-inflammatory effects and also seem to have anti-angiogenic properties.⁵ Intraocular use of triamcinolone acetonide in humans was first reported less than 10 years ago.⁶

The diligence of the ophthalmic medical personnel assisting with IVTA injections is an important key for a successful outcome. Preparation of the patient and the injection is a vital component of IVTA. The technician's

unwavering adherence to sterile technique is critical in eliminating potentially tragic complications such as endophthalmitis. During follow-up as well, a technician's keen eye and appplanation skill will often provide the surgeon's first glimpse into the early success or possible complications of the treatment.

As IVTA injections are done more routinely in the office, it is important that the surgeon has a knowledgeable and skilled technician involved from the beginning. The technician and surgeon must carry out every IVTA procedure with the same precision and attention to detail. Familiarity with the procedure should make it go smoother and faster, but not with any less care.

PREPARATION

In an effort to make IVTAs take place in the most efficient manner, some preparation is required. Pre-assembly of an IVTA procedure kit is helpful. With all supplies and instruments in one location, looking for individual components at the time of the procedure is eliminated. The drugs that should be included in each kit include triamcinolone acetonide-40mg/ml (Kenalog-40—Bristol-Myers Squibb Company; Princeton, NJ), topical povidone-iodine ophthalmic solution (Betadine® 5%—manufactured for Alcon Laboratories, Inc.; Fort Worth, TX), ciprofloxacin drops, sterile tetracaine, and 4% topical lidocaine. The kit should also contain the ophthalmic surgical instruments that will be used: lid speculum, caliper, and fine-toothed forcep. Other items particular to the surgeon's needs should also be included in the IVTA kit.

Supplies needed for anterior chamber paracentesis might also be added if that is a routine or possible part of the procedure.

PROCEDURE

The technician's role begins with the "History of Present Illness." Regardless of whether the patient is being seen in the office for the first time or the 100th, it is important to ascertain and properly document the eye condition, duration, and previous treatment. Also important is documentation of all other ocular history—past surgeries, history of glaucoma, previous reactions to ocular steroids and systemic adverse drug reactions. Complete information is needed by the surgeon to determine the benefits and risks of the proposed treatment.

Once treatment is indicated, the surgeon is ultimately responsible for outlining the surgical risks and benefits, and having the patient sign an informed consent. Though the patient has been informed of the nature of the IVTA and a consent is signed, most people still have questions. Patients tend to be anxious about the idea of "someone sticking a needle in my eye." The first step for the technician is making the patient as physically and psychologically comfortable as possible. Making them physically comfortable is as easy as reclining the chair and placing a pillow under their head and under their knees. While preparing the patient and the injection, dim the room lights

enough that you can see what you need to do, without having overhead lights or a surgical lamp shining directly in their dilated eyes. Explaining each step as you go along can help ease a patient's mind. Let them know the pain involved is minimal or non-existent. It also helps to tell them that the actual injection takes only about 3 seconds.

Explain the various drops as you place them in the eye to be treated. First, instill tetracaine, then ciprofloxacin, and then Betadine®. Topical Betadine® should rest on the eye for ten full minutes prior to injection in order for maximum anti microbial effect.⁶

While the patient rests with the drops in, set up the sterile field. Place the caliper, lid speculum and a small-toothed forcep on the field. Place a sterile drape, several cotton tips, tuberculin syringes, a paracentesis needle or blade, a large gauge needle for drawing up the triamcinolone, and a 27g x ½" needle for injection on the field. Swab the Kenalog-40 bottle stopper with an alcohol prep. When dry, swab the bottle stopper with a sterile cotton tip that has been saturated with Betadine®.

Continue the patient preparation by cleaning the lashes and peri-orbital area of the treated eye thoroughly with povidone- iodine swabs using standard ophthalmic surgical technique. Saturate the end of sterile cotton tip with several drops of tetracaine and place pleget approximately 3-5mm from corneal limbus on bulbar conjunctiva at the location specified by physician as the injection site (usually infero-temporally.) Also, apply the pleget to the

temporal corneal limbal area for anterior chamber paracentesis if it becomes indicated. Be mindful not to touch the prepped patient with anything non-sterile. Replace the tetracaine soaked pleget several times and repeat until the surgeon is ready to begin.

Once the patient is prepped and the injection and paracentesis site is anesthetized, the surgeon will place the sterile drape over the patient's eye, insert the lid speculum and use the caliper to mark the exact site of the injection.

The technician will then assist the surgeon with the assembly of a sterile tuberculin (1cc) syringe and a long, large gauge needle (18g x 1 ½"). Shake the Kenalog well immediately prior to drawing it up in order to evenly mix the triamcinolone suspension. Hold the Kenalog vial upside-down as the surgeon inserts the needle and draws the contents into the tuberculin syringe. Assist the surgeon with replacing the large gauge needle with 27g x ½" needle.

As the surgeon injects the desired amount of Kenalog into the eye, the technician should stand by closely with a sterile cotton tip and ciprofloxacin drops. Immediately upon withdrawal of the needle, the technician must tamponade the injection site with the cotton tip to prevent Kenalog from escaping the wound and to minimize the risk of vitreous prolapse.⁸ Instill generous amounts of ciprofloxacin immediately after withdrawal of the needle.

The surgeon's preference and the individual circumstance surrounding the IVTA will determine whether an anterior chamber paracentesis (AC tap) will be performed. Some surgeons do it as a matter of routine following the injection, others do not. The benefits versus risks of introducing another needle into the eye needs to be considered.

If an AC tap is to be performed, the surgeon will use the limbal site the technician has previously anesthetized as the site of entry. Immediately after release of an adequate amount of aqueous, the technician should again flood the eye with ciprofloxacin drops.

Once the procedure(s) have been completed, the lid speculum should be removed, and the intraocular pressure checked with a tonopen. Check the patient's vision for at least the recognition of hand motion (HM). The surgeon will visualize the fundus and patency of the central retinal artery with an indirect ophthalmoscope. If the vision and the IOP are at an acceptable level, the patient can be prepared for release.

PATIENT DISCHARGE

Preparing the patient to leave the clinic is also a vital function of the technician. The patient will need to be cleaned up, patched, and instructed on how and when to use eyedrops. Follow up appointments should be confirmed. It is important to prepare the patient for what to expect until the first follow up visit. Once the patch is removed, it is normal that there may be some blood on the inside of the patch as well as on the eye where the

injection occurred. Some mild to moderate irritation is to be expected-- but severe, escalating pain is a signal to call the office. The patient may notice floaters in the treated eye. These should dissipate over the next few days. Letting the patient know what to expect in the immediate post-op period will go a long way toward eliminating the frantic phone call later in the day or in the middle of the night to the doctor on call. Providing the patient with written information regarding post op instructions, medications, and expectations reinforces what you tell them as they leave. Also include a phone number and symptoms they could experience which should prompt them to call right away.

FOLLOW UP

The patient should return the next day for follow up. The purpose of the one-day follow up appointment is to check intraocular pressure and for possible infection (endophthalmitis.)

At the one-day follow up visit, the technician should inquire as to the comfort of the patient since the procedure. A cursory look at the anterior segment of the eye with a slit lamp should alert the technician to any problems that may be brewing. Accurate IOP measurement is imperative.

The role of the technician in the IVTA does not end at the one-day follow up, however. Patients undergoing IVTA tend to be regular visitors to the clinic due to the very nature of their disease. They will probably be returning several times over the next few months. At each visit, it is crucial the

technician obtain a reliable history as well as accurate vision and IOP measurements.

CONCLUSION

Macular edema associated with vein occlusion, diabetic retinopathy, and age related macular degeneration can result in devastating and progressive visual loss. Intravitreal triamcinolone acetonide injections offer hope of preserving and possible improving vision in certain cases. The technician fills an important role alongside the surgeon in all aspects of IVTA injections. From the patient history, through the procedure itself, and onto the follow up visits, the conscientious technician will make the IVTA process go smoothly and comfortably thereby giving the best chance for a good outcome.

SUMMARY

As intravitreal triamcinolone acetonide injections become more common in the eye clinic, it is important that the ophthalmic technician does his or her best to ensure the best possible outcome for the patient. A skilled and knowledgeable technician is an important key in the entire IVTA procedure.

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1. IVTA is use to treat macular edema associated with:
 - a. Diabetic retinopathy.
 - b. Central retinal vein occlusion.
 - c. Age related macular degeneration.
 - d. Irvine-Gass syndrome
 - e. A through C above.

2. Until intravitreal injections came into use, adequate levels of corticosteroids delivered to the retina and vitreous could only be accomplished by using:
 - a. Eyedrops.
 - b. Retrobulbar/peribulbar injection.
 - c. Oral prednisone.
 - d. Sub-tenon injection.
 - e. Intra-muscular injection

3. The technician's adherence to sterile technique can help prevent:
 - a. Elevated IOP.
 - b. Endophthalmitis.
 - c. The patient from moving or talking during the procedure.
 - d. The need for a second IVTA.
 - e. All of the above.

4. Which of the following instruments would not be needed in an IVTA kit?
 - a. Caliper.
 - b. Curette.
 - c. Forceps.
 - d. Lid speculum.
 - e. C and D above.

5. Documentation of which of the following is important for the surgeon to determine if an IVTA procedure should be done?
 - a. Present illness including the current condition and duration of illness.
 - b. Past eye history including past surgeries and history of glaucoma.
 - c. Past reactions to steroid use.
 - d. Visual acuity
 - e. All of the above.

6. To make the patient as comfortable as possible during the IVTA procedure, recline the chair, place a pillow beneath the head and knees, dim the lights, and:
 - a. Leave the room.
 - b. Discuss potential complications with the surgeon.
 - c. Explain each step to the patient as you go along.
 - d. Tell the patient what a busy day you're having.
 - e. Turn up the music

7. The actual IVTA injection takes about:
 - a. 3 seconds.
 - b. 10-15 seconds.
 - c. 60 seconds.
 - d. 2 minutes.
 - e. 1 hour.

8. For full antimicrobial effect, topical Betadine should be in contact with the eye for a full:
 - a. 1 minute.
 - b. 5 minutes.
 - c. 10 minutes.
 - d. 30 minutes.
 - e. 1 hour.

9. Numbing the patient's eye for IVTA injection should be done with:
- Fluress.
 - Alcaine.
 - Cotton tips soaked in tetracaine.
 - Retrobulbar injection of lidocaine.
 - General anesthesia
10. The technician must immediately tamponade the injection site after withdrawal of the needle in order to:
- Stop the bleeding.
 - Prevent a spike in IOP.
 - Prevent Kenalog escape from the wound.
 - Stop the surgeon from injecting more.
 - Keep the eye from moving.
11. After the procedure, the patient will possibly:
- See floaters.
 - Have 20/20 vision.
 - Have pain and photophobia.
 - Be nauseous.
 - All of the above.
12. The main purpose for having the patient come back the next day is to:
- Charge them for another office visit.
 - Check for elevated IOP and endophthalmitis.
 - Check to see if their vision is better yet.
 - See if the Kenalog is still in their eye.
 - All of the above.

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