Practical/illustrative session on intravitreal injections and complications

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EYE CLINIC

KBTH

IVI indications

1. **Endophthalmitis**
- **2. Exudative AMD (Wet)**
- **3. PDR/CSME**
- **4. CRVO & BRVO**
- **5. ROP**
- **6. Iris neovascularization**

STEPS OF INTRAVITREAL INJECTION

- Under topical anesthesia.
- Betadine painting over lid, 1-2 drops of Betadine instilled in the conjunctival sac, then washed with normal saline.
- Drug is taken in tuberculin syringe with 30G needle.
- Ask the patient to look up.
- From the inferior-temporal quadrant at 4 mm from limbus (Phakic) the needle is directed towards the centre of the globe and drug is injected.
- Injection site pressed with a cotton bud.
- IOP and CRA perfusion is assessed.
- Topical Antibiotic is administered for one week. (TDS to QID)

Anesthesia

- Lidocaine-based
- (topical, gel, s/c injection)

- No difference in pain scores

Povidine-iodine Eye Prep

- Providone-iodine is the mainstay of conjunctival antibacterial surface preparation
- widely considered part of the standard of care for IVI.
- Typically, 5% PI solution is used.

Povidine-iodine Eye Prep

- There are two additional important issues in this area:
- 1) the length of time the PI should be in contact with the conjunctiva; and
- 2) the use of topical PI shown to reduce the ocular flora substantially prior to
- injection and diminish the risk of endophthalmitis.

Peri-injection Topical Antibiotics

- There is a preponderance of evidence suggesting the avoidance of routine peri-IVI topical antibiotics,
- assuming proper PI prep is employed.
- Neither moxifloxacillin or gatifloxacillin achieves therapeutic levels in the vitreous.

Needle Diameter

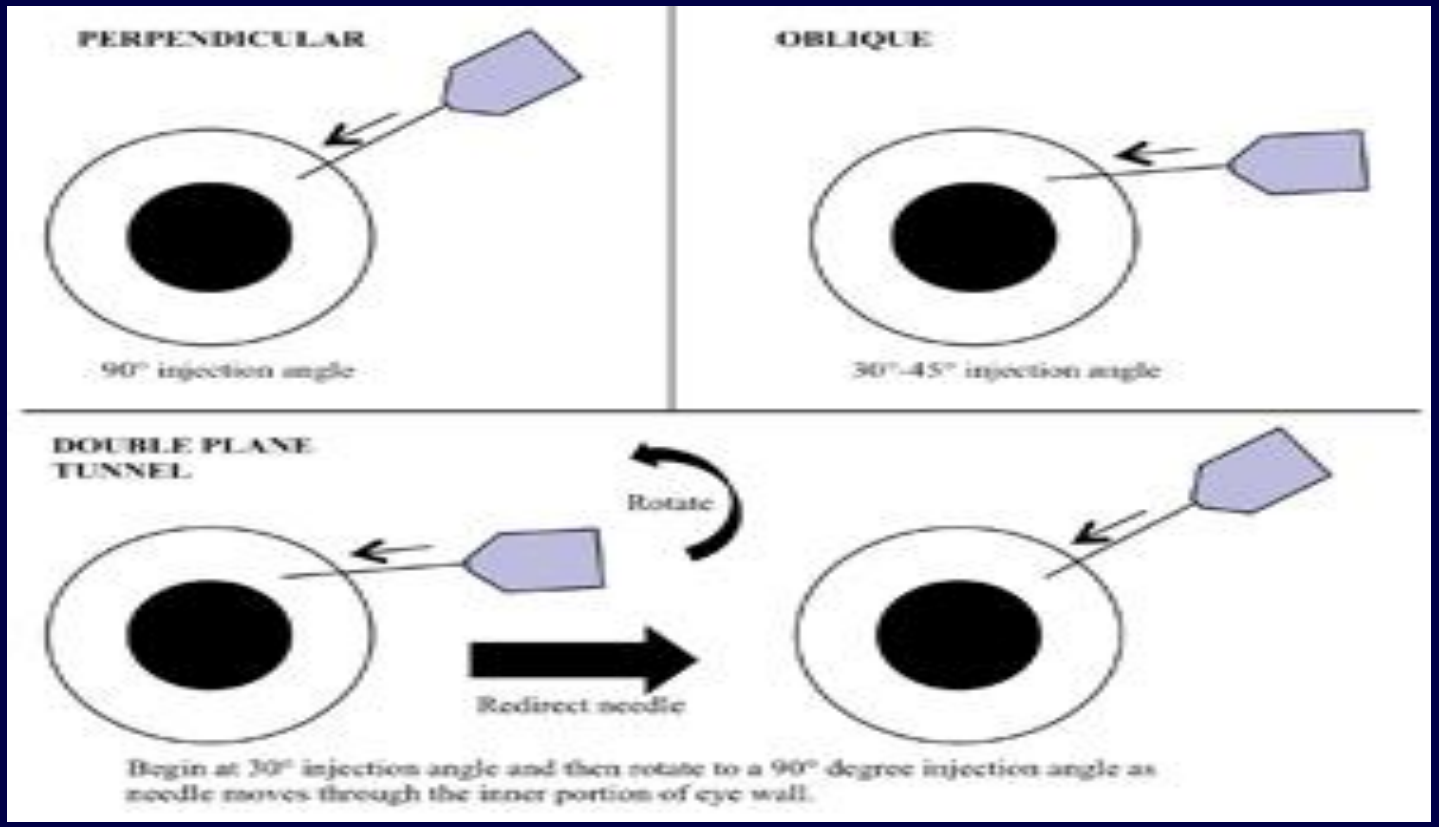
- Statistics shows significant advantages with 30-gauge or smaller needles

- and trends towards advantages with even smaller-gauge needles for IVI.
- (Vitreous incarceration (wick) , Fluid reflux, ***Patient discomfort.***)

Needle Angle

- There is significant evidence suggesting that a tunneled or shallow needle angle will reduce reflux of drug
- or vitreous back through the sclerotomy,
- maximizing actual delivered dose of medication and minimizing vitreous wicking.

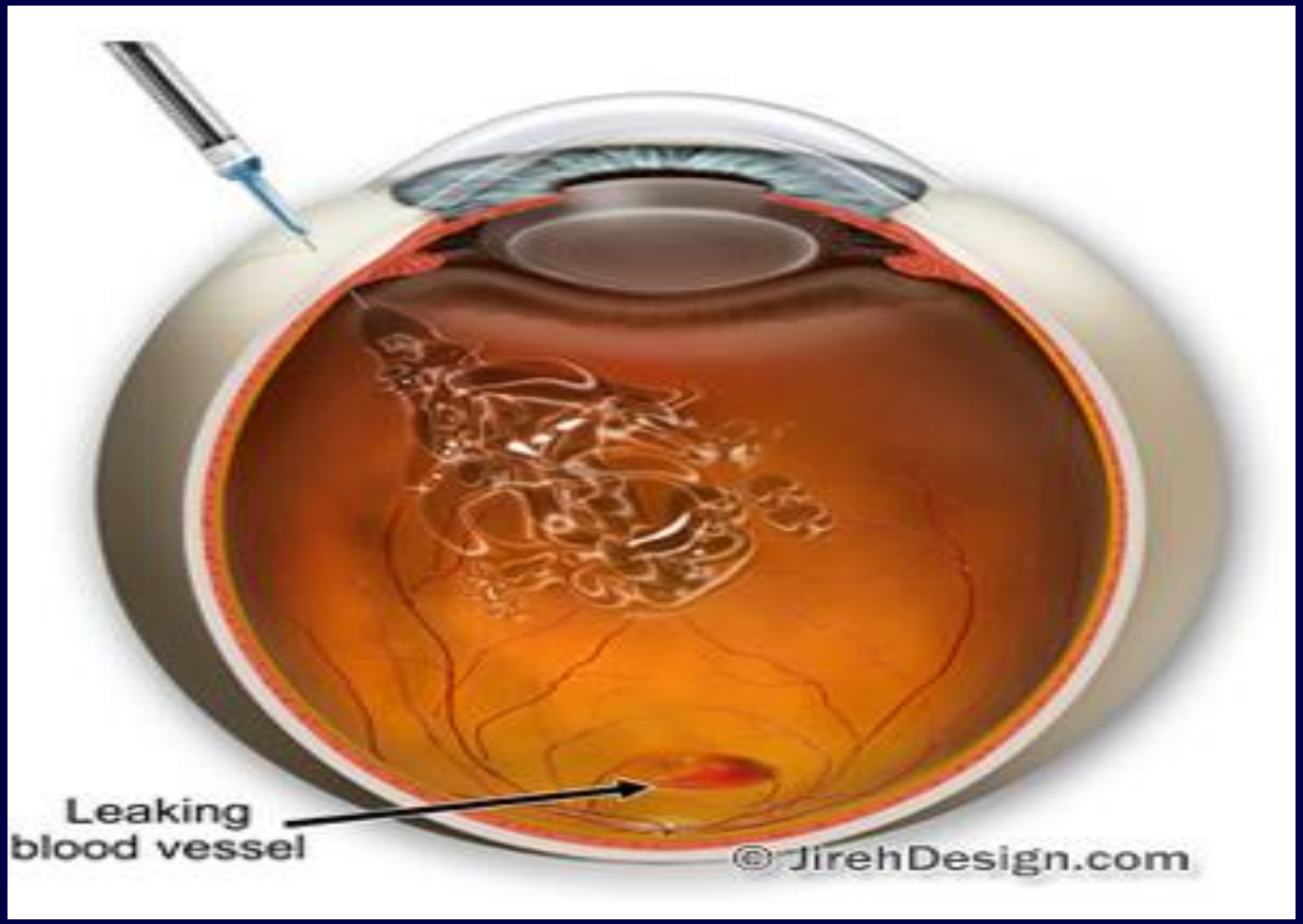
Needle Angle



Distance From Limbus

Distance From Limbus

Site of injection 3.0 to 4.0 mm posterior to the limbus that can pass through full thickness retina.



Post-Injection IOP

- Significant, although short-lived, elevation in intraocular pressure occurs after IVI, even with 0.05 ml of injection volume

Post-Injection IOP

- It is not appropriate to withhold indicated intravitreal treatment due to a patient's existing glaucoma.

- However, in patients in whom vision may be more sensitive to IOP insult, employing consistent techniques to mitigate IOP spikes may be advisable,

COMPLICATIONS

- Vitreous Hemorrhage.
- Accidental injury to Lens capsule.
- Raised IOP.
- Retinal tears/detachment.
- Central Retinal Artery Occlusion.
- Endophthalmitis.

COMPLICATION'S

Table-3: Ocular complications.

Complications	Frequency	Percentage
Subconjunctival haemorrhage	35	23%
Conjunctival chemosis	1	0.7%
Regurgitation of drug	8	5.3%
Transient rise of intraocular pressure	7	4.7%
Anterior uveitis	4	2.7%
Lens injury	3	2%
Iatrogenic vitreous haemorrhage	1	0.7%

Endophthalmitis

- Infectious endophthalmitis remains one of the most devastating complications of intravitreal injections.

- Endophthalmitis is of particular concern in diabetic patients given their known increased susceptibility to infection.

Endophthalmitis

- The classic symptoms of post-injection endophthalmitis (redness, pain, photophobia, vision loss, hypopyon, and vitritis) may be masked by the antiinflammatory effect of triamcinolone.

- related to the injection procedure itself,
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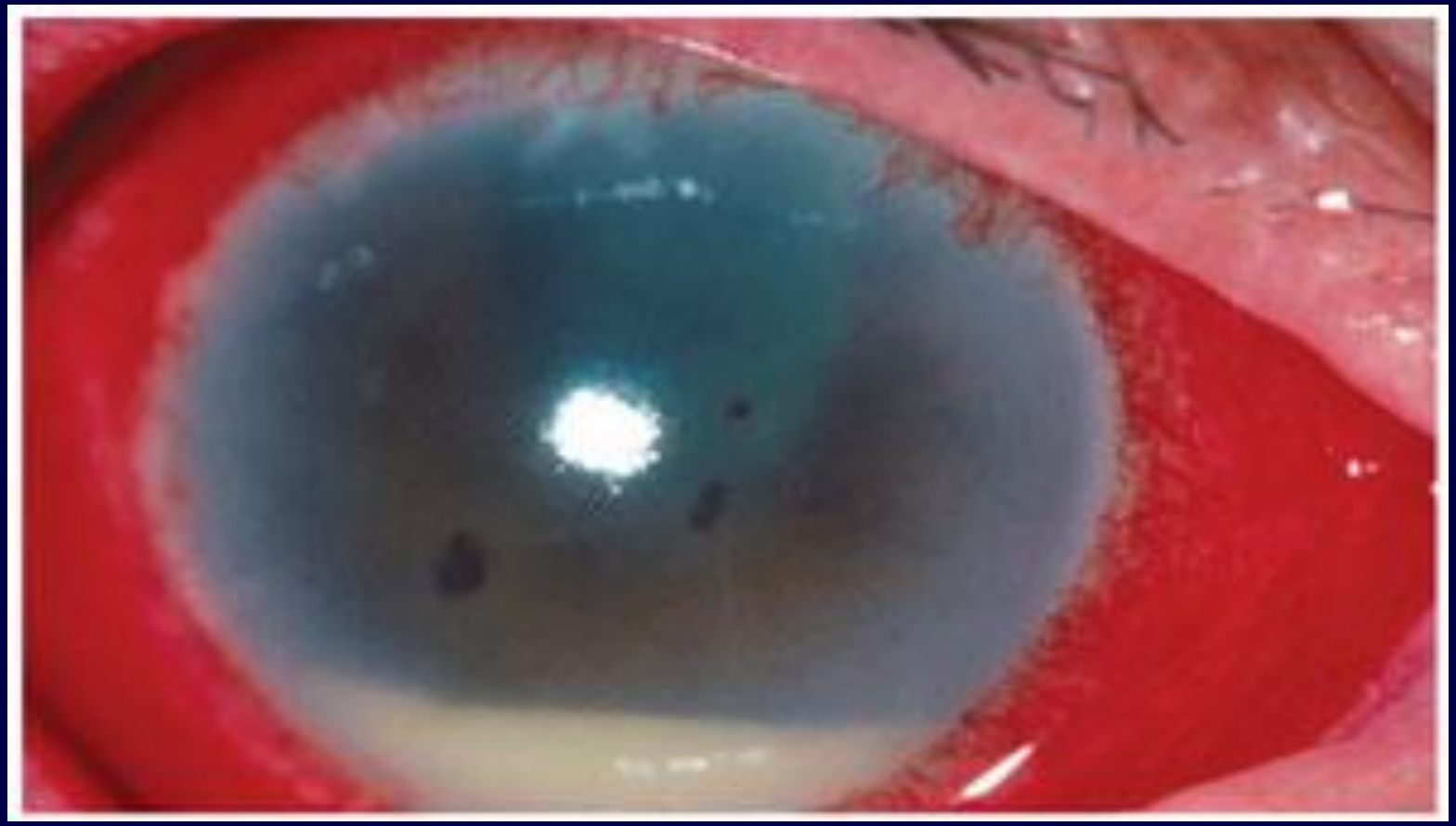


- Anterior segment of a patient with infectious endophthalmitis. Note the global injection and steamy cornea in conjunction with the hypopyon.

Retinal Detachment

- RD as a result of the IVI technique is rare.

- Most of these cases were related to the underlying disorder and traction due to retinal fibrovascular proliferation rather than to the injection procedure.

Retinal Detachment

- The etiology of RRD after IVI have been related to the induction of PVD
- Incorrect technique of injection.[2]
[9]
- Paying attention to the surgical technique has been advocated to decrease the rate of RRD.

Vitreous Hemorrhage

- Similarly, although intraocular hemorrhage (retinal hemorrhage, vitreous hemorrhage, or hyphema) was reported occasionally after the injection,

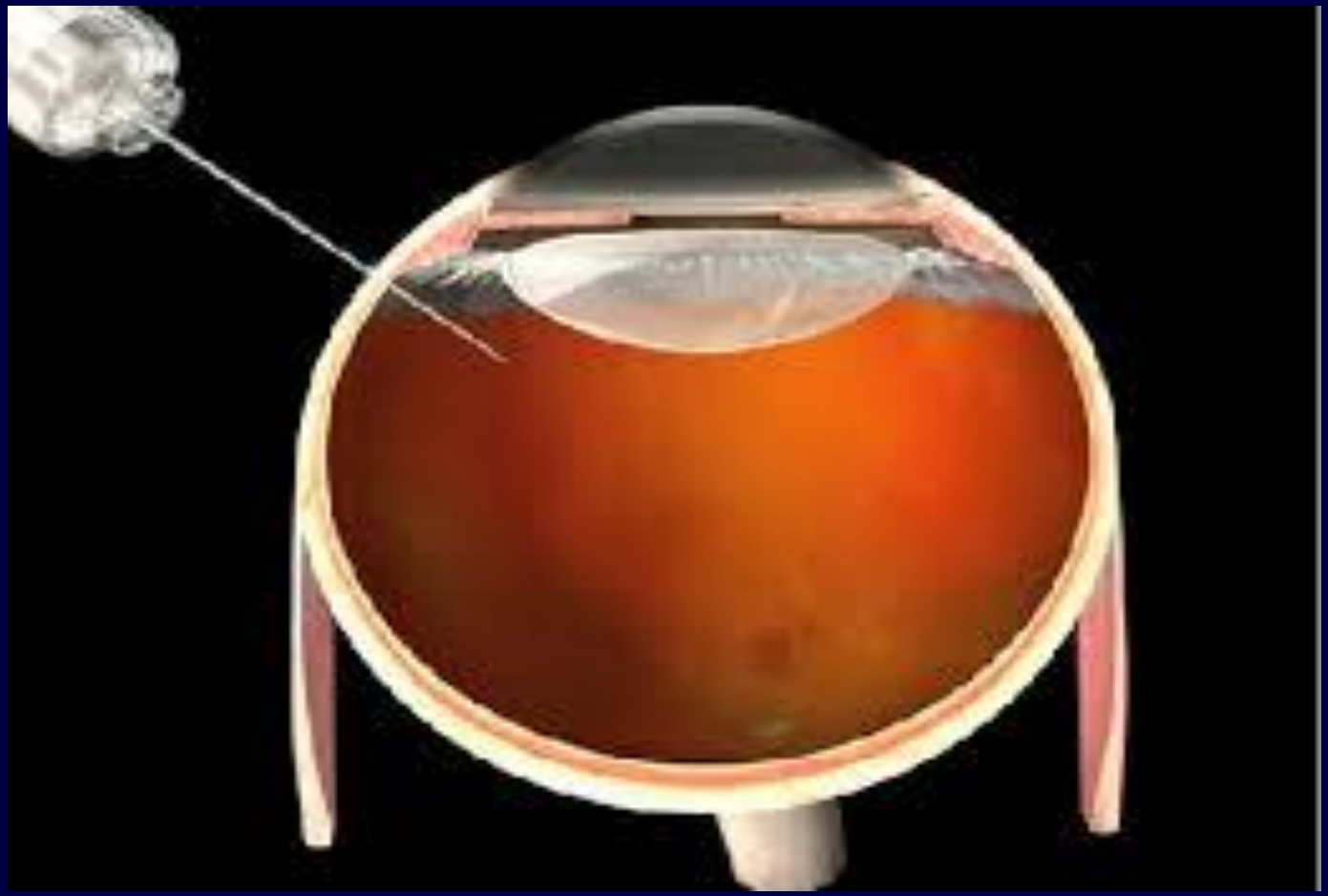
- These cases were mostly attributed to the underlying pathology.

Cataracts

- The effect of systemic or local corticosteroids in inducing cataracts is due to release of growth factors,

- Accidental injury to Lens capsule.

Cataracts



Increase IOP

- Acute rise of intraocular pressure (IOP) after IVI is injection-procedure-related and lasts a few hours at most.
- Pharmacologic effect of VEGF blockade,
- An inflammatory trabeculitis,
- Impaired outflow owing to protein aggregates/silicone droplet debris,

Increase IOP

Corticosteroids induce

- 1. physical and mechanical change in the trabecular meshwork architecture, resulting in an increase in resistance to outflow of aqueous humor.

- 2. Steroids also increase the deposition of substances in the trabecular meshwork

Conclusion

- The IVI of anti-VEGF agents is the current standard care for the treatment of center involved DME with vision loss.
- Clinical trials have reported the rates of ocular and systemic complications related to these procedures.
- Clinicians performing IVI need to be aware of these potential problems.
- Most reported complications are related to the IVI procedure itself
- and careful attention to appropriate injection technique can reduce the risk of their occurrence.

THANK YOU