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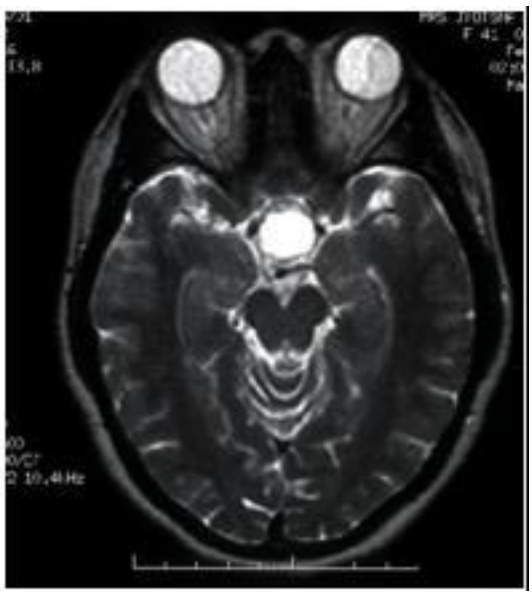

Axial Section of MRI Brain T2 Image showing brilliantly enhancing cystic lesion

SANKARA NETHRALAYA

EDITORIAL

Surgical outcome is dependent on various factors such as case selection, surgical skills of the surgeon, post-operative care and also the surgical instruments. Improper care of surgical instruments leads to shorter life of the instrument as well. Ophthalmic surgical instruments are particularly prone to wear and tear, owing to their delicate construction and are also expensive to replace. Knowledge about proper care of surgical instruments is difficult to come by and the article on surgical instrument care in this issue of Insight is tailored to address this lacuna.

Treatment of uveitis has gone beyond steroids with the widespread use of immunosuppressives. However, issues such as the indications, the agent to be used, duration of use, precautions during usage and schedule for tapering the immunosuppressive agent have to be understood well before one prescribes these potentially dangerous drugs. These issues have been lucidly dealt with in the Perspective article of this issue.

This issue also introduces two new type of tonometers with an analysis of how they stack up with those that are currently in use.

To commemorate the 25th year of Nethralaya, a number of conferences have been planned and information about the same is also available in this issue.

Dr Mahesh P Shanmugam
Dr Arun Narayanaswamy
Editors

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Perspective:

Current Concepts of Immunosuppression in Uveitis

Kalpana Babu and Jyotirmay Biswas

Uveitis remains one of the causes of blindness. However, the better understanding of several uveitic entities and recent advances in the diagnosis (ultrasound biomicroscopy, indocyanine green angiography, polymerase chain reaction) and management (newer steroids, immunomodulators, implant devices and increased usage of immunosuppressives), have resulted in preserving the vision and preventing blindness in many cases. This article reviews the current immunosuppressive agents that are used to treat sight threatening uveitis.

Corticosteroids:

Corticosteroids have been the mainstay of treatment for ocular inflammatory diseases since their development. They are currently the most rapid and most effective ocular immunosuppressants available.

Mechanism of action: The anti-inflammatory action involves phospholipase A 2 inhibitor protein which controls the release of inflammatory mediators (prostaglandins and leukotrienes) by inhibiting the release of arachidonic acid.

Topical corticosteroids penetrate well into the anterior segment of the eye and are useful in the management of anterior uveitis and episcleritis. The weaker steroids include rimexolone, fluormethalone and loteprednol etabonate.[1] Loteprednol etabonate is a new synthetic steroid which is deactivated by the

Table 1.

Parameter	**Guidelines**
Initial dose	1 -1.5mg/kg/day
Maximum adult oral dose	60-80 mg/day
Maintenance dose (adult)	≤ 10mg/day
Tapering schedule	Over 40mg/day, decrease by 10mg/day over 1-2 weeks 40-20mg/day, decrease by 5mg/day every 1-2 weeks 20-10mg/day, decrease by 2.5mg/day every 1-2 weeks 10-0mg/day, decrease by 1-2.5mg/day every 1-4 weeks
Monitor	Blood pressure, weight, glucose every 3 months, lipids (cholesterol & triglycerides) annually, Bone density within first 3 months and then anually
Supplemental treatment	Calcium 1000-1500mg daily
High dose oral corticosteroids If disease worsens or no response after 2-4 weeks If disease not completely quiet after 4 weeks	Do not continue longer than 1 month Add immunosuppressive agent Add immunosuppressive agent
In selected situations, where an immediate effect is needed (VKH, Sympathetic ophthalmia, necrotising scleritis, serpiginous choroiditis, sight threatening vasculitis, optic neuritis), give intravenous methylprednisolone at 0.5-1gm/day for 3 days followed by oral prednisone	

esterases in tissues and aqueous. They have a lower propensity to increase the intraocular pressure. Betamethasone is an intermediate strength steroid. The potent topical steroids such as prednisolone and dexamethasone are most effective for treating active inflammatory disease. The acetate form of prednisolone enters the aqueous fastest. Periocular injection of steroids provide a high concentration of steroid locally and is effective in intermediate and posterior uveitis. We follow the Smith and Nozik technique of posterior subtenon injection. We prefer to use a long acting depot preparation (triamcinolone acetonide). These injections can be repeated every 1 to 2 months as needed. More recently, a sustained release intravitreal implant (fluocinolone acetonide)for intermediate and posterior noninfectious uveitis is undergoing a multicentre clinical trial.[2] Systemic corticosteroids remain the treatment of choice for uveitis. Prednisone is the most commonly used oral corticosteroid. The guidelines[3] for the use of prednisone for chronic ocular inflammation is given in Table 1.

Ideally, corticosteroids should be taken as a single dose in the morning. This is not only physiological because the normal peak of adrenal corticosteroid production occurs in the morning, but also helps the patient to sleep better. Alternate day dosage has been shown to be an effective strategy to reduce the side effects while maintaining the same corticosteroid effect. Stress doses of corticosteroids should be given at times of major injuries or surgical procedures. As the inflammation is different in each patient, treatment has to be individualized.

Even if used in short term, systemic corticosteroids can cause a number of side effects. Before starting patients on systemic corticosteroids, a discussion on the important side effects is prudent. The most notable side effects include cushingoid faces (dosage ³ 5-10mg/day), hypertension, hyperglycaemia, psychosis, osteoporosis and electrolyte imbalance. Intravenous methylprednisolone can cause cardiac arrhythmias and cardiovascular collapse.

Overall, corticosteroids are valuable in the treatment of ocular inflammation. However the lack of tolerance to high dose of steroids and systemic side effects preclude their long term use. Other immunosuppressive agents have now been used in addition to or in place of steroids.

Immunosuppressive agents:[3,4,5]

Immunosuppressives can either be supplementary or an alternative to steroids. Some of the indications for such regimen in current practice are listed in Table 2.

They can be grouped as

1. **Antimetabolites:** Azathioprine (Imuran or Azoran), Methotrexate (Rheumatrex), Mycophenolate mofetil (Cellcept)
2. **Alkylating agents:** Cyclophosphamide (Cytoxan), Chlorambucil (Leukeran)
3. **T cell inhibitors:** Cyclosporine (Sandimmune and Neoral), Tacrolimus (prograf)
4. **Newer agents:** Sirolimus (Rapamycin), leflunomide (Arava), cytokine inhibitors (Daclizumab, Etanercept, Infliximab)

Table 2: Indications

Absolute indications:	Relative indications:	Questionable indications
VKH syndrome	Retinal vasculitis	Children with pars planitis
Sympathetic ophthalmia	Intermediate uveitis	
Rheumatoid sclerouveitis	Serpiginous choroiditis	
Behcet's disease	Severe anterior uveitis (HLA B27)	
Wegener's granulomatosis	Severe panuveitis	

These drugs take several weeks to have an effect. Thus high dose oral corticosteroids should also be used initially along with the immunosuppressive agent. Once the disease is quiet, the corticosteroids are tapered either to a low level or if possible, discontinued.

1. Azathioprine: Purine nucleoside analog. It interferes with adenine and guanine ribonucleotides by suppression of inosinic acid synthesis which inturn interferes with DNA replication and RNA transcription. It is most effective in preventing proliferation of B & T lymhocytes.

Indications: Sympathetic ophthalmia, Behcet's disease, VKH syndrome, Wegener's granulomatosis in remission, chronic iridocyclitis and scleritis.

Onset of action: Slow. Takes 3-4 weeks

Dosage: 1.5-2.0mg/kg/day. Available as 50mg tablet. After 6-12 months therapy, withdrawal of drug is strongly encouraged.

Side effects & Monitoring: Bone marrow suppression(dose related) and hepatotoxicity. A total white blood cell count and platelet count should be performed every 3-4 weeks. If total WBC count falls below 3,500 cells/ mm3 or platelet count falls below 1 lakh/ mm3, the dosage of the drug is adjusted or stopped. The liver function tests should be performed every 3 months. Azathioprine remains a useful adjunct for immuno-suppressive therapy with an acceptable side effect profile.

Contraindications: Preexisting hepatic disease, active infections and pregnancy.

2. Methotrexate: Folate analog. It inhibits dihydrofolate reductase, inhibiting the production of tetrahydrofolate. This inhibits the production of thymidylate which is essential for DNA replication.

Indications: Juvenile rheumatoid arthritis, scleritis associated with connective tissue disease, sarcoidosis associated panuveitis, children with parsplanitis, myositis and orbital pseudotumor and vasculitis.

Dosage: 0.1 -0.5 mg/kg/week taken orally once in a week, available as 2.5mg tablet.

Side effects & monitoring: Hepato-toxicity, bone marrow suppression and interstitial pneumonia. Liver function tests and complete blood counts every 3-4 weeks.

3. Mycophenolate mofetil: Inhibits purine metabolism. It selectively inhibits inosine monophosphate dehydrogenase, affecting the synthesis of guanosine and hence inhibiting the proliferation of lymphocytes (B & T cells).

Indications: Alternative to azathioprine (Less side effects).

Dosage: 1000mg twice a day, available as 250mg & 500mg capsules.

Side effects: Weight loss and gastrointestinal upset, bone marrow suppression.

4. Cyclophosphamide: It forms an active metabolite which causes DNA crosslinking and inability to replicate. It inhibits both cellular and humoral immunity. They are used when a rapid onset of action is needed (severe ocular inflammation).

Indications: Necrotising scleritis, Behcet's disease, Wegener's granulomatosis, Systemic lupus erythematosus, refractory intermediate uveitis.

Dosage: Oral: 1-5mg/kg/day. Available as 25mg or 50mg tablets. Pulse doses of intravenous cyclophosphamide (500mg/m2) can be given once in 4 weeks.

Side effects & monitoring: Haemorrhagic cystitis and bladder cancer; bonemarrow suppression, alopecia and sterility. Complete blood count and routine urine analysis weekly till it is stable and then once in 3-4 weeks. Drink 2-3 litres of water per day.

5. Chlorambucil: slower onset of action compared to cyclophosphamide. It substitutes an alkyl group for H+ in organic compounds causing crosslinking and hence interference in DNA replication.

Indications: Behcet's disease, Sympathetic ophthalmia and recently serpiginous choroiditis.

Dosage: 0.1-0.2mg/kg/day, available as 2mg tablet.

Side effects: Bonemarrow suppression.

6. Cyclosporin A: It is derived from the fungus *Tolypocladium inflatum gams*. It works on T cells by binding to an intracellular peptide known as cyclophilin. By inhibiting cyclophylin activity, it blocks the transcription and production of interlukins, activation of CD4 & CD8 T cells and the production of other lymphokines such as interferon.

Indications: Similar to azathioprine.

Dosage: 2-5mg/kg/day in one dose or two divided doses daily, available as 25,50, 100mg capsule.

Side effects: Renal toxicity, hypertension, hepatotoxicity, gingival hyperplasia, hypertrichosis.

Monitoring: Blood pressure and serum creatinine should be checked initially every week until it is stable and then every 3-4 weeks.

Contraindications: Uncontrolled hypertension, renal insufficiency, age more than 60 years.

7. Tacrolimus : Actions & indications similar to cyclosporine. It is most effective early in the course of therapy but effectiveness decreases gradually with prolonged treatment.

Dosage: 0.05/kg/day orally is effective for uveitis, available as 0.5, 1 & 5mg capsule.

Newer Agents:[3,4,5]

With recent advances in molecular biology, a number of treatment modalities have become available that target very specific aspects of the immune system. They are:

A. Leflunomide (Arava): immunomodulator that inhibits pyrimidine synthesis via selective inhibition of dihydro-oratate dehydrogenase. Activated T-cells are susceptible to this drug.

B. Sirolimus (Rapamycin): Macrolide immunosuppressant. It is an antiproliferative agent which blocks the growth promoting action of cytokines like IL-2 and IL-4. Clinically, cyclosporine-A and sirolimus have been shown to act synergistically as immunosuppressants. Clinical experience in uveitis is limited.

C. Cytokine inhibitors:

1. **Daclizumab (Zenapax):** Binds to TAC subunit of the IL-2 receptor blocking the effect of IL-2 and inhibits proliferation of T cells.(severe HLA B27 uveitis).
2. **Etanercept (Enbrel):** Tumor necrosis factor antagonist. Dosage: 2.5mg 2-3 times a week by subcutaneous route.
3. **Infliximab (Remicaide):** Chimeric antibody against tumor necrosis factor - α (TNF-α).

Table 3: Cost for 1 month therapy

Steroids	Cost (Rupees)
Tablet prednisone	243.00
IV Methyl prednisolone 1gm (3days)	2474.00
Immunosuppressives	
Tablet Methotrexate	100.00
Tablet Cyclophosphamide	240.00
Tablet Azathioprine	1200.00
Cap. Cyclosporine A	9000.00
Tablet Mycophenolate mofetil	12000.00

Conclusions:

Oral corticosteroids represents the mainstay in the treatment of severe ocular inflammation. However, as a result of its long term systemic side effects, an immunosuppressive drug may be supplemented or substituted. The choice of the immunosuppressant depends on the familiarity with the drug, side effects and the therapeutic action. Prior counselling of the patient along with regular monitoring is necessary when the patient is on immunosuppressive agents. With careful use of these medications, a better control of inflammation can be achieved.

Suggested reading:

1. *Loteprednol Etabonate. US Uveitis Study group. Controlled evaluation of loteprednol etabonate and prednisolone acetate in the treatment of acute anterior uveitis. Am J Ophthalmol 1999;127:537-544.*
2. *Jaffe GJ, Ben-Nun J, Guo H, et al. Fluocinolone acetonide sustained drug delivery device to treat severe uveitis. Ophthalmology 2000;107:2024-33.*
3. *Jabs DA, Rosenbaum JT, Foster CS et al. Guidelines for the use of immunosuppressive drugs in patients with ocular inflammatory disorders: Recommendations of an expert panel. Am J Ophthalmol 2000;130:492-513.*
4. *Tessler H, Goldstein DA. Update on systemic immunosuppressive agents. Focal points.American academy of ophthalmology 2000; volume XVIII(11).*
5. *Djalilian AR, Nussenblatt RB. Immunosuppression in uveitis. Ophthalmol Clin N Am 2002;15:395-404.*
6. *Sribhargava N, Khetan V, Biswas J. Guidelines for usage of corticosteroids & Immunosuppressive agents in the management of uveitis. Karnataka journal of ophthalmology 2002;19:6-14*

Multiplex PCR from aqueous humour in a case of acute retinal necrosis

Mamta Agarwal, B. Mahalakshmi, Anuj Gogi, J Biswas and H N Madhavan

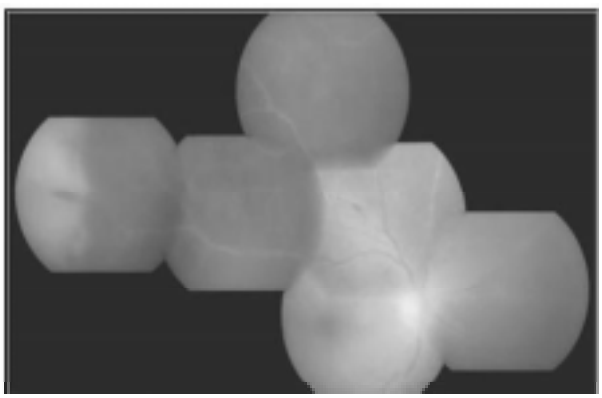
Acute retinal necrosis (ARN) was first described by Urayama and coworkers in 1971.[1] This syndrome comprises of focal areas of retinal necrosis, circumferential spread of necrosis, occlusive vasculitis, vitritis and late onset rhegmatogenous retinal detachment. It is caused by herpes group of viruses i.e. varicella zoster (VZV), herpes simplex type 1 and 2 (HSV) and cytomegalovirus (CMV).[2] Diagnosis of ARN depends on either clinical findings or laboratory investigations. The latter includes demonstration of virus specific antigens, serological analysis of serum or intraocular fluid, histopathology of retinal biopsy specimen or viral culture. Clinical diagnosis may at times be difficult in these cases due to intense vitreous haze. Moreover, many entities share the same clinical features. Detection of local antibodies by ELISA may prove beneficial but this indirect method is usually negative in early window period of the disease. Besides, it is less sensitive in differentiating types of viruses. Viral cultures on the other hand may require as long as 4 weeks to grow.

Polymerase chain reaction (PCR) is a relatively new technique that is extremely sensitive, specific and rapid in detecting small amounts of DNA from intraocular fluid samples. This technique amplifies genomic sequence of an infectious agent over 1 million times within hours.[3] For each specific pathogen, a separate PCR has to be performed. As a consequence, serial detection of individual pathogens is time consuming and extremely expensive. Hence a new molecular technique called Multiplex PCR[4] has been devised. PCR reactions for multiple pathogens are performed simultaneously in a single reaction.

We report a case of acute retinal necrosis in a young patient where multiplex PCR of aqueous fluid revealed VZV genome. Prompt treatment achieved resolution of peripheral retinal lesions and vitreous inflammation.

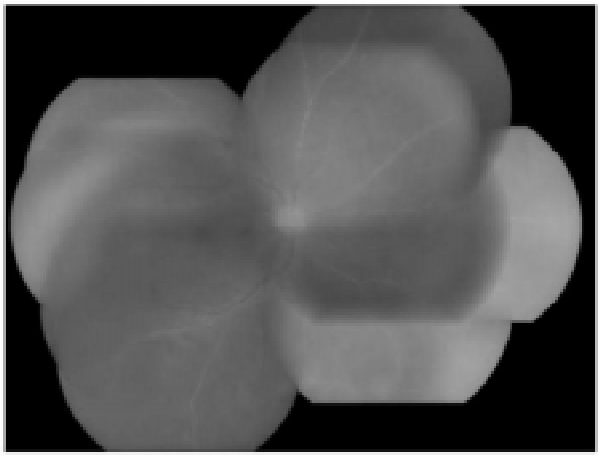
Case report

A 25 year old gentleman presented with pain, redness and decreased vision in the right eye of 8 days duration. Systemic history was non-contributory. The serum ELISA tests for HIV 1 and 2, CMV, VZV, HSV 1 and HSV 2 which were done elsewhere were negative. On examination, best corrected visual acuity was 6/18, N8 in right eye and 6/6, N6 in left eye. Slit lamp examination showed aqueous cells 3+ and flare 3+. Posterior segment examination revealed typical necrotizing retinal lesions with scalloped margins in the peripheral fundus along with active vasculitis and dense vitritis. Disc was hyperaemic. Slit lamp biomicroscopy and fundus examination of the left eye was unremarkable. Intraocular pressure by applanation tonometry was within normal range in both eyes. Clinical diagnosis of acute retinal necrosis was made. Anterior chamber tap was done to confirm the viral etiology by immunoflurescence and PCR. Microscopic examination of direct smear using immunoflurescence did not yield any



Peripheral necrotising lesions with retinal vasculitis in a case of acute retinal necrosis

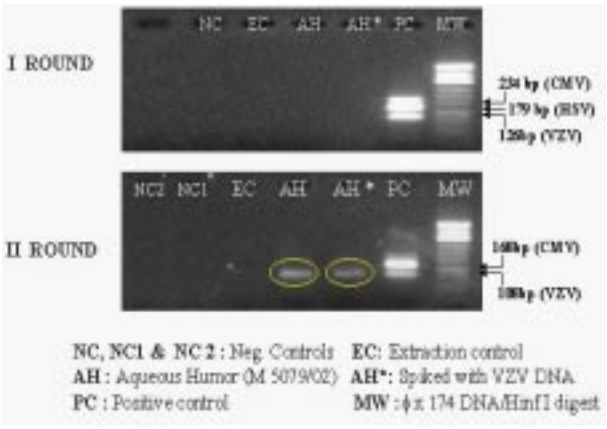
conclusive results. Multiplex PCR was carried out for VZV, HSV and CMV. DNA was extracted from aqueous humor using the modified method of Narita et al.[5] In brief, 50µl of the specimen was added to 200µl of lysis buffer (40 mMTris cl, pH - 8.0 .1mM EDTA, 1%SDS, 20µg proteinase K), vortexed thoroughly and incubated at 55°C in a water bath for two hours. This was followed by phenol - chloroform extraction and ethanol precipitation. The DNA was finally dissolved in 30µl of milliQ water. An extraction control using only the reagents was done simultaneously. A nested multiplex PCR was done using primers for HSV (DNA polymerase gene), VZV (immediate early gene b 3) and CMV (morphological transforming region 2) simultaneously in a single tube. For the first round of amplification a 50µl reaction was set with 240µM of each dNTPS, 1X buffer (10 mM Tris -cl, pH 8.3, 50 mM KCl, 0.01% gelatin, 1.5 mM $MgCl_2$, 4 units of Tag DNA polymerase, 1µM of each primer for HSV, 20µM for VZV, 50pM for CMV and 10 µl of extracted DNA as template. The amplification was carried out in a DNA thermal cycler with thermal profile of initial denaturation at 94° C for 2 minutes followed by 35 cycles of denaturation at 94 °C for 45 seconds, annealing at 60°C for 45 seconds and extension at 72°C for 45 seconds. For second round of nested amplification, only VZV and CMV primers were used. Each PCR run had positive and negative controls. The amplified products were detected by gel electrophoresis. In this case a band at 108 bp at the end of second round of amplification indicated the presence of VZV DNA in the aqueous humor. Patient received intravenous Acyclovir 500 mg every 8 hourly for 7 days, oral Prednisolone 60 mg /day and tablet Ranitidine 150 mg twice daily. Topical therapy included Prednisolone acetate 1 hourly and Homatropine 2 times daily. After a week of treatment, vitritis resolved and peripheral retinal lesions showed healed response. Laser photocoagulation was also done along the posterior margin of lesions to prevent subsequent development of retinal detachment.



Healed acute retinal necrosis with sclerosed vessels

Discussion

Acute retinal necrosis is a sight threatening infectious posterior uveitis that needs prompt diagnosis and early treatment. Though the diagnosis can be made clinically in most of the patients, in atypical presentations, it is necessary to advise laboratory investigations. PCR is a relatively new molecular biologic technique, which detects DNA or RNA of an infectious agent from a small intraocular specimen. The intraocular fluid can either be collected from aqueous or vitreous chamber. An aqueous tap is an easier method as it can be conveniently performed as an outpatient procedure. 200-300µl of aqueous fluid is usually enough to detect a specific viral genome. The vitreous



Agarose gel showing amplified products of multiplex PCR for CMV, HSV and VZV in Aqueous humor

tap is a surgical approach in which a therapeutic vitrectomy is performed and a minimum of 0.5-0.7 ml fluid is collected. As acute retinal necrosis is caused by herpes group of viruses each responding to different antiviral therapy, it becomes essential that diagnosis is made as early as possible. Knox et al[6] described the utility of PCR in cases of posterior uveitis that had diagnostic dilemma due to media opacity and atypical response to treatment. One of the major limitations in performing a diagnostic PCR is the need for performing serial analysis on samples to test for a parade of suspected pathogens which is time consuming and costly. Dabil et al[7] studied the validity of a diagnostic multiplex PCR assay for infectious posterior uveitis. Jackson et al[8] employed a simple multiplex PCR for differentiating between adenoviral and herpes simplex conjunctivitis. This technique involves detecting multiple genomes of infectious agents in a single reaction thereby reducing the time and cost involved in PCR based techniques. However, multiplex PCR suffers from drawbacks of lower sensitivity and specificity as the number of primer pairs increases. The use of multiplex PCR in our patient for VZV, HSV 1 and 2 and CMV led to the early detection of VZV genome which allowed prompt and appropriate treatment by intravenous acyclovir and thereby controlling the inflammation. The multiplex PCR is a rapid and reliable diagnostic tool in establishing the definitive pathogen in cases of viral retinitis and other types of posterior uveitis.

References

1. *Nussenblatt R B, Palestine AG. Acute retinal necrosis. Uveitis: fundamentals and clinical practice. Chicago: Year Book Medical, 1989: 407-414.*
2. *Culbertson WW, Bluemenkranz MS, Haines H, Gass DM, Mitchell KB, Norton EWD. The acute retinal necrosis syndrome: Histopathology and etiology. Ophthalmology 1982; 89:1317-1325.*
3. *Mullis K, Faloona F, Scharf S, Saiki R, Horn G, Erlich H. Specific enzymatic amplification of DNA in vitro; the polymerase chain reaction. Symp. Quant Bio.1986; 51:263-273.*
4. *Chamberlain J S, Gibbs Ra, Ranier JE, Nguyen PN, Caskey CT. Detection screening of the Duchenne muscular dystrophy locus via multiplex DNA amplification. Nucleic Acid Research 1988; 16:11141-11156.*
5. *Narita M, Matsuzono Y, Shibala M, Togashi. T. Nested Amplification protocol for the detection of Mycobacterium Tuberculosis. ACTA Paediatrics 1992; 81:997-1001.*
6. *Knox CM, Chandler D, Short GA, Margolis TP. Polymerase chain reaction based assay of vitreous samples for diagnosis of viral retinitis: use in diagnostic dilemmas. Ophthalmology.1998; 105:37-44.*
7. *Dabil, Michelle L Boley, Therese M Schmitz, Russell N. Van Gelder. Validation of a multiplex diagnostic polymerase chain reaction for infectious posterior uveitis. Arch Ophthalmol. 2001; 119:1315 -1322*
8. *Jackson R, Morris DJ, Cooper RJ, et al. Multiplex Polymerase Chain reaction for adenovirus and herpes simplex virus in each swab. J. Virol Methods.1996; 56:41-48.*

Care of Surgical Instruments

A Mahalingam and P Suresh Kumar

Introduction:

Good surgical results are dependent upon sterile instruments in good working order, used by skilled people. Instruments often used in ophthalmic surgeries are extremely delicate and need careful handling. With the surgical technology advancing quickly so is the type and complexity of the surgical instrumentation. It would make sense that the investment in instrumentation be protected through process monitoring and improvement. The longevity of the instruments is in direct proportion to the care and handling it receives during its lifecycle. Microsurgical instruments must be handled with utmost of care when cleaning and assembling them for use.

Some of the useful tips to safeguard your surgical instruments are:

I. HANDLING OF INSTRUMENTS:

a. Intra operatively:

- Use instruments for the purpose they were designed for.
- Handle instruments gently - Avoid bouncing, dropping or overstraining.
- No instruments should ever be thrown down.
- Scissor tips should not be touched.
- Re-sheathing of the disposable needles should be done carefully to avoid needle stick injuries

b. Post operatively:

- Needles must be disposed off in the correct receptacle.
- Keep fine tipped instruments separately before sending them for cleaning and sterilization.
- Discard all the disposables as per instructions laid down by hospital authority.
- Replace knives and special instruments in specified cases carefully.
- Replace any malfunctioning instrument immediately.

II. MAINTENANCE:

a. Cleaning:

With the complexity of the instruments and the varying materials, we must take extra time to ensure this process is not overlooked. The choice of cleaning will depend on the instruments and the materials. This could be a manual disinfection and cleaning or machine disinfection. Cleaning is the single most step in making a medical device ready for use. Without adequate cleaning, many disinfection and sterilization processes are ineffective. Cleaning is critical in removal of gross debris & prevention of cross contamination. Cleaning generally means the removal of, rather than the killing of, microorganisms. If stubborn stains persist on box locks or other areas, scrub the affected area with detergent and a nylon bristle brush. Never use abrasives or a wire brush.

- All used instruments, regardless of size, should be completely immersed in distilled water before leaving the operating room.
- Clean instruments immediately after use to prevent blood & other debris from drying onto the surface.
- All instruments from a procedure, including ones not used, should be completely opened and cleaned in either an ultra sonic cleaner using a detergent with a pH of 7.
- Do not use steel wool, wire brushes, highly abrasive cleaners or detergents with a high pH, as this will damage the passive layer or skin of your instrument.
- Distilled water is preferred. If it is not available, freshly boiled tap water may be used.

- The instrument must be supported carefully whilst cleaning.
- A soft toothbrush can be used to clean each instrument individually.
- Needle holders, scissors and artery forceps must be completely opened to clean inside the jaws.
- Cannulae must be flushed through. Lens matter, vitreous and visco-elastic gel block cannulae permanently.
- Cotton wool should not be used to clean instruments as it damages the tips.
- A lubricant (sewing oil) prevents the development of stiff joints and inhibits the development of corrosion.
- Lubricant is needed for hinged instruments only, e.g., scissors, needle holders and artery forceps.
- The instruments are dipped, one by one, into the lubricant; they must not be soaked.
- If a lubricant is not available, the instruments should be rinsed in clean hot water.
- Do not put cannulae in lubricant.
- Excess lubricant or soap is rinsed off and the instrument left in the open, dismantled position on a clean absorbent cloth.
- Cannulae must be flushed through again to remove any soap debris.
- Keep box locks, ratchets open when cleaning, and sterilizing instruments. Disassemble all instruments with removable parts.
- Keep box locks, ratchets, hinges and serrations free of any debris. If substances are allowed to build up in the box lock, the instrument will become stiff and be subjected to misalignment and cracking.
- Never put stainless steel instruments and plated instruments together in the ultrasonic cleaner, as electrolysis will cause corrosion or etching on the stainless steel instruments.
- Reusable phaco tubings should be cleaned as per the manufacturers instruction.
- All endoscopic instruments with flush ports should be flushed immediately after use with an acceptable detergent prior to washing or soaking.
- Endoscopic instruments should be completely disassembled prior to cleaning.

b. Drying:

- Instruments must be dried thoroughly before being stored. If the instruments are put away wet or damp they will rust.
- An air dryer is very effective for drying the joints and crevices of instruments. If an air dryer is not available, dry gauze may be used cautiously.
- Never force open a forceps even when drying, as this will distort the instrument.
- Thoroughly dry the instruments before wrapping them. Any remaining moisture, particularly in the box locks, hinges and crevices may result in corrosion.

c. Inspection:

Before assembling all instruments should be carefully inspected for both appearance and damage with the help of microscopic and magnoscopic examination.

Scissors:

Check for smooth action. Test sharpness by cutting latex or tissue paper at tip of scissor without hanging.

Hemostats and Clamps:

Check box lock for cracks, jaw alignment, interlocking of serrations and make sure ratchets hold securely.

Dressing and Tissue Forceps:

Check alignment of tips when closed and meshing of serrations or interlocking of teeth.

Needle Holders:

Check box lock for cracks and close to first ratchet and hold tip to light to check wear on jaws.

Endoscopic Instruments:

Endoscopes should be inspected, tested, used and processed according to the manufactures written instruction. Proper inspection, testing, use and processing of endoscopes reduce the risk of adverse patient outcomes; prevents damage to the lenses and fibre optic components and helps to prevent delay.

Endoscopes and related equipment should be inspected for integrity, function and cleanliness at the following times

1. Before use
2. During the procedure
3. Immediately after decontamination
4. Before disinfection and sterilization

All Others (i.e. retractors, suctions, etc):

Visibly check that no parts are missing and look for obvious signs of wear.

Corrosion and rust:

Most instruments are made from stainless steel. Stainless steel does not usually rust. However, it can corrode if it is washed in saline or left to soak for a long period in any liquid.

Once the instrument has started to rust it will become weak, and the rust will eventually destroy and break the instrument (metal fatigue). Rust commonly occurs on chrome or nickel-plated instruments. When the plating wears off, the carbon steel is exposed and is further corroded by autoclaving and washing. If this occurs the instruments cannot be sterilized properly. Cheaper instruments tend to rust more easily as the stainless steel is of a poorer quality.

Corrosion and rust is caused by:

- Inadequate cleaning, rinsing and drying
- Using tap water
- A malfunctioning autoclave.

Spotting & staining:

Thorough inspection may reveal discolouration of the metal. Some stains can be rubbed off with a rubber eraser but it may leave a rough surface. Contact with hydrochloric acid and iodine should be avoided. Slow evaporation of water condensation on the instrument will cause light or dark spots. Mineral deposits left behind after the water has evaporated are the result of using tap water. The use of distilled or demineralized water will eliminate the problem. Spots can also be the result of opening the autoclave door before steam has been completely exhausted, which causes a slow drying process. Another cause of spotting can be traced to reusable instrument linen wrappers. During laundering process, it is important that the detergents are thoroughly rinsed off. Any residues will be carried on to the instrument surface during steam sterilization.

Instruments not rinsed thoroughly after chemical sterilization will stain.

d. Oiling:

With repeated sterilization, instruments will become stiff and difficult to open. Good quality sewing machine oil should be used each week on hinged instruments. This is especially relevant when working in a very hot, dry climate.

- Use a 2ml syringe and 21G needle to draw up the oil.
- Change to a 25G needle, open the instrument and place a drop in the jaws; work in the oil by repeatedly opening and closing the instrument.
- Wipe off any surplus oil with gauze.

Surplus oil on an instrument will inhibit sterilization. Using an instrument lubricant will help to maintain the action of the instrument but oiling is still necessary.

e. Repairs:

Eventually scissors will need sharpening, forceps re-aligning, etc. Instrument companies

will repair and re-sharpen instruments to a high standard but repairing instruments take time. The cost of a good repair is much cheaper than buying a new instrument.

f. Preparing tray for sterilization:

- String all ring handles in open position including scissors and towel clips.
- Protect all sharp tips.
- The Protectors must cover the whole blade or the jaws of the instruments.
- Load heaviest instruments in bottom of tray.
- Autoclave dissimilar metals separately.
- Do not overload tray of instruments.

III. STORAGE AND TRANSPORTATION:

Shelving:

Shelves with glass covered doors are preferred, as they are easy to keep clean. Ideally, instruments need to be in a dry, well-ventilated, secured cupboard. A drying agent, e.g., silicone gel can be placed on the shelves to absorb moisture in the air.

- The instruments must be arranged in an orderly manner and labeled.
- Protectors should be used when instruments are in storage.
- Never pile instruments on top of each other.
- Micro-scissors work on a spring action and are kept in the open position until in use.
- Needles and cannulae can be sterilized ready for use on a silicone mat or a thick piece of material.

Instrument Trays:

Individual slots in the tray hold one instrument; this prevents the instruments from coming in to contact. Trays are useful for transporting instruments, e.g., to outreach clinics and the sets are ready immediately for sterilization. Protectors must be used.

Instrument Cases:

These cases are metal or plastic boxes containing a protective silicone mat which prevents the instruments touching during storage and sterilization.

IV. SECURITY:

Ophthalmic instruments are very expensive and delicate. It is therefore necessary to ensure a secure place to store the instruments when not in use.

- Storage shelves should be in a locked cupboard.
- New members of theatre staff should be instructed carefully in the care and maintenance of theatre instruments.
- A person should be made responsible for the care of instruments.
- An inventory of all instruments should be carried out monthly to ensure that there are no discrepancies.
- Any instrument that is faulty must be removed immediately from the theatre and sent for repair.
- The operating theatre should be locked and windows shut when not in use.

CONCLUSION:

Proper care of instruments during an operative procedure, coupled with meticulous methods of cleaning and disinfection, ensures longevity for all surgical instruments. It is a shared responsibility between the surgical team and the sterilization unit.

Suggested Reading :

1 *Seymour S Block. Disinfection, sterilization and preservation - 4th Edition, Lea & Febiger, USA 1991: 948-974.*

2 *William Sharney. Hand book of modern hospital safety, Lewis publishers, USA 1999: 267-325.*

3 *Ophthalmic Medical Assisting -an independent study course, second edition, American Academy of Ophthalmology, 1994:234-245.*

4 *Eileen Dixon. Theatre Technique, Bailliere Tindall, London 1983: 35-51*

5 *Lucio Buratto, Carlo Lovisolo, Marco Monealvi. Assisting the ophthalmic surgeon, Fogiliazza Editore, Milano 1997: 132-141.*

Suggested Browsing :

1. http://www.surgical-access.com
2. http://www.kaisers.com
3. http://www.aorn.org
4. http://www.infectioncontroltoday.com
5. http://www.cdc.gov
6. http://www.sklarcorp.com
7. http://www.jceh.co.uk
8. http://www.c-step.com
9. http://www.specsurg.com
10. http://www.doh.gov.uk
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The Effect of Yellow Filters on Contrast Sensitivity in Normal subjects - A Pilot Study

R Krishna Kumar, S Prem Nandhini, G Arathy, Della Davis and Ajitha Jose

Introduction

Literature has shown yellow filters are largely prescribed for shooters, skiers, and hunters. However in India two wheeler riders commonly use it as sunglasses. Clinician rarely prescribes it for normal subjects. However it is prescribed as low vision aid especially in patients with macular disease conditions. These patients are found to experience enhanced quality of vision with the yellow tint. Studies have shown increased contrast sensitivity in optic atrophy and in macular conditions[1,2]. Literatures have shown increased contrast sensitivity[3,4], to decreased contrast sensitivity[5] and variation in different lighting conditions in normal subjects[4,5].

In order to study the effect of yellow tinted glasses on contrast sensitivity in our population, a pilot study was conducted.

Patients and methods

Twenty eyes of ten subjects (age range: 08 to 37; Male: 5 Female: 5) with no ocular abnormality and with best-corrected visual acuity were evaluated for contrast sensitivity with and without yellow tinted glasses using Cambridge Low Contrast Gratings under normal photopic condition. The test was done with undilated pupils.

Instrumentation: Cambridge Low Contrast Grating test is a square wave gratings with spatial frequency of 4 cycles per degree equivalent to 6/4.5 visual acuity. It consists of a twenty page spiral bound 210 x 295 mm booklet. The testing distance is 6 mts. Each pair consists of two pages one with grating and the other without grating. Each pair is called test stimuli. There are ten such test stimuli. Each test stimuli is shown to the patient and are asked to appreciate whether the gratings are seen on the top or bottom of stimuli. Four series of testings are done for each eye. The end point is determined by the occurrence of the first error. The sum of the errors of four series will give the total score and contrast sensitivity is determined from the conversion table[6].

Results

Among twenty eyes tested for contrast sensitivity, twelve (60%) showed increase in contrast sensitivity with yellow tinted glass, six (30%) showed decrease in contrast sensitivity and two (10%) showed no variation.

Discussion

60% of eyes showed increased contrast sensitivity using yellow tinted glass. Literatures have shown that the shorter wavelengths in sunlight that are scattered by atmospheric haze and moisture are filtered out by yellow tints[7].

Six eyes of four subjects showed decrease in contrast sensitivity using yellow tinted lenses. However except one, who is suffering from rheumatoid arthritis showed decrease in both the eyes, others showed a decrease in contrast sensitivity in one of the eyes. May be binocular contrast sensitivity evaluation would have given more insight about it, along with other two subjects who showed unilaterally no variation.

In conclusion, this study shows that yellow tinted lenses gives the benefit of enhanced contrast sensitivity in normal subjects under photopic conditions.

References

1) *Ding C, Sun B, and Zheng Y. Contrast sensitivity of several blindness inducing eye diseases and the influence of tinted filter lens. Hung Hua Yen Kotsa Chih 1997; 33(4): 286-8.*

2) *Eleanor E. Faye. Teaching the Patient to Use Aids: The Preliminary to the Prescription. In: Eleanor E. Faye, 2nd edition. Clinical Low Vision. Boston: Little Brown Company, 1984:102-03.*

3) *Rieger G. Improvement of contrast sensitivity with yellow filter glasses. Can J OphthalmoI 1992;27(3):137-8.*

4) *Yap M. The effect of a yellow filter on contrast sensitivity. Ophthalmic Physiol opt 1984;4(3):227-32.*

5) *Leguire LE, Suh S. Effect of light filters on contrast sensitivity function in normal and retinal degeneration subjects. Ophthalmic Physiol opt 1993; 13(2): 124-8.*

6) *Manual of Cambridge Low contrast Gratings. Clement Clarke International Ltd. A Haag-streit company. Essex CM20 2ED England.*

7) *I M Borish: Borish's clinical Refraction. 1st edition. W. B. Saunders company, 1998:942.*

Supra Sellar Mass - Atypical Presentation

S Ambika, Satya Karna and Veena Noronha

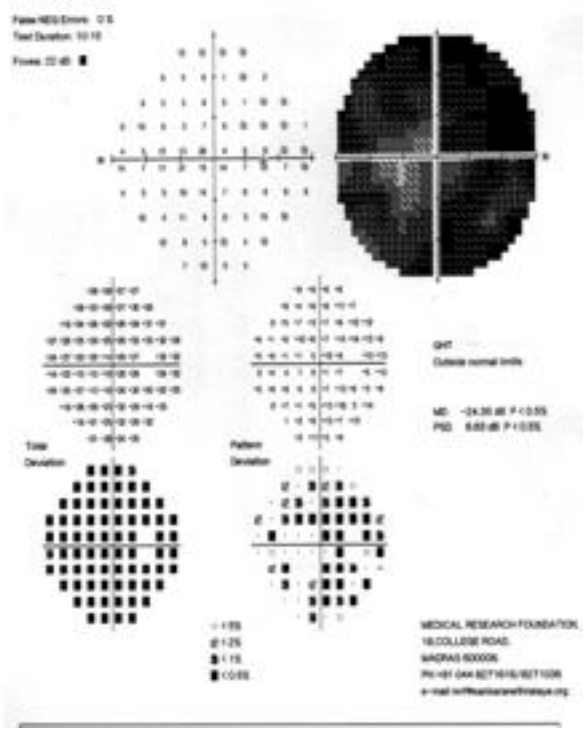
We report a case of 42-year-old female patient who presented with complaints of recurrent attacks of sudden loss of vision. She had been treated elsewhere as a case of optic neuritis with intravenous methyl prednisolone therapy. She was found to have a suprasellar cystic lesion on CT scan of the brain in our hospital.

Case Report

A 42 year old lady presented to us with complaints of recurrent attacks of sudden visual loss in both the eyes on and off for the past 2 years. She was diagnosed as optic neuritis and treated by local ophthalmologist with intravenous methyl prednisolone therapy (IVMP) for 3 days but found no improvement in her visual condition. Her best corrected visual acuity in the right eye was 6/36; N18 and the left eye was 6/24; N6. She had optic nerve head pallor of both the eyes, the right eye more than the left eye. She was advised for visual field analysis, which revealed temporal defects in both the eyes. As she had similar episodes of visual loss previously and had no response to IVMP therapy she was suspected to have an intracranial pathology. She was advised CT scan of the brain and orbit, which revealed a well defined round hypodense lesion with hyperdense capsule in the suprasellar cistern. It measured 1.9 x 2.0 x 1 cm. There was no evidence of sellar extension. Pituitary and sellar floors were normal. With a probable diagnosis of Craniopharyngioma or Rathke's pouch cyst, she was referred to a neuro-surgeon. She underwent transphenoidal excision of the cyst. The histopathology report of cyst contents was suggestive of tumour cells simulating pituitary adenoma. After 3 weeks postoperatively her visual acuity improved to 6/18; N18 in the right eye and 6/6; N6 in the left eye.

Discussion

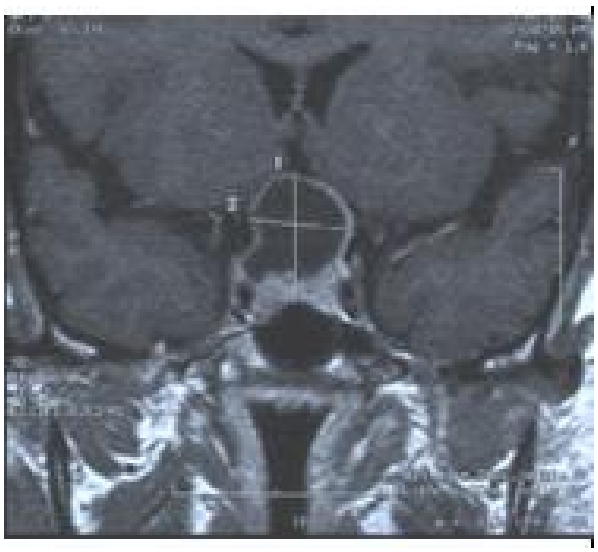
Suprasellar and sellar lesions usually present as painless, gradual vision loss,



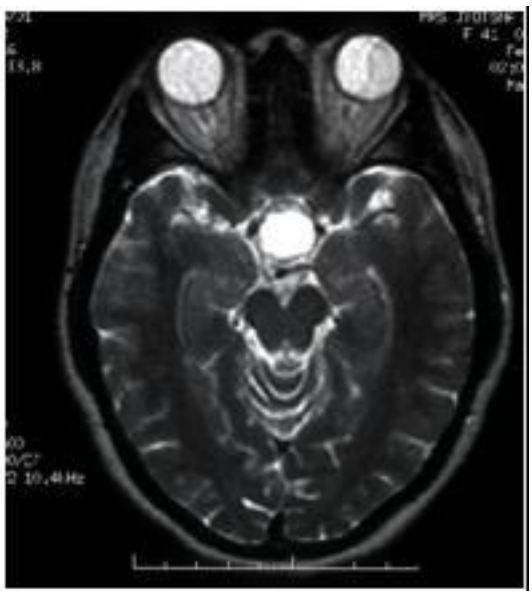
Pre-op Humphrey visual field of right eye. Left eye had high fixation losses hence unreliable.

diplopia, field defects (usually temporal field loss). These masses because of close proximity to optic chiasm and optic canal can cause optic nerve compression producing vision loss. If treated early vision may be repaired. So early detection and intervention is a must in these conditions. Although these are usually chronic in nature, certain cases can present in a subacute manner.

The common suprasellar masses are Rathke's cleft cyst, Craniopharyngioma, Pituitary adenoma all of which all invariably have their sellar components. An uncommon lesion - suprasellar arachnoid cyst can also present in this site. This rare condition is a derivative from the Liliequist membrane that arises as a diverticulum. This cyst on CT and MRI of the brain appears to contain fluid with neuroimaging characteristics of CSF; but cyst wall doesn't enhance. They present usually before the age of 6 years.



Saggital section of MRI of Brain



Axial Section of MRI Brain T2 Image showing brilliantly enhancing cystic lesion

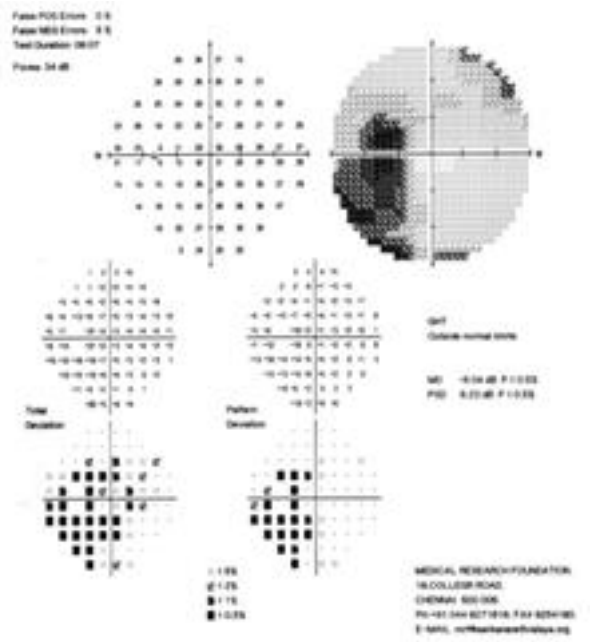
Craniopharyngiomas can have mixed appearance of both solid & cystic components. Pituitary adenoma though classically is a solid appearing tumour, cystic transformation has also been reported.

Clinically - apart from vision disturbances, endocrine & hypothalamic dysfunctions, spasticity, gait disturbances have also been reported in few patients with suprasellar masses.

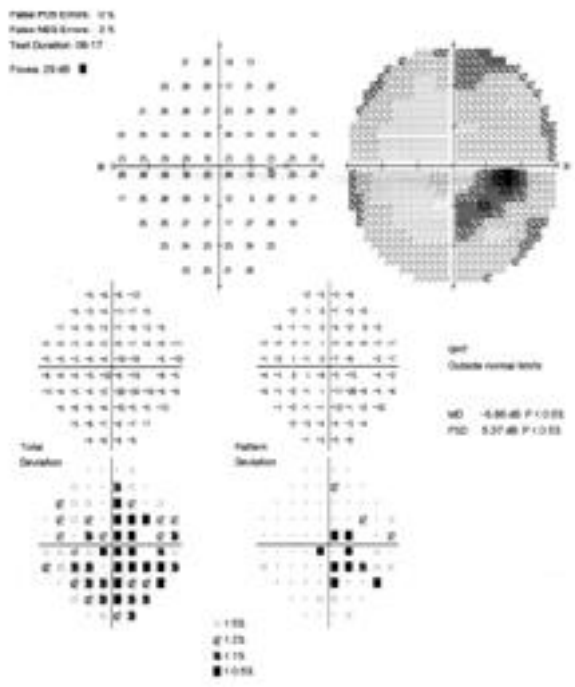
As this patient presented with recurrent attacks of visual loss, probably the cyst would have compressed the optic chiasm whenever it was filled with contents and spontaneous improvement of vision has occurred following drainage of contents into CSF. This very rare phenomenon can be easily mistaken for an optic neuritis like clinical picture.

Post surgical visual fields

Left Eye



Right Eye



Treatment:

Treatment invariably is done by neurosurgical removal of the masses. Trans - sphenoidal, subfrontal craniotomy are common routes of removal. In case of arachnoid cysts - endoscopic ventriculo-cystostomy seems to be the safest procedure.

Conclusion:

Any case with a suspicious and atypical history and a clinical picture of optic nerve pallor should undergo neuroimaging to rule out an intracranial space occupying lesion. Visual impairment because of compressive pathology is reversible only in the initial stages. Hence appropriate investigations at an early stage are mandatory to prevent permanent visual loss in such patients.

Bibiliography:

1. *Rapidly progressive visual loss caused by a sellar arachnoid cyst: reversal with transsphenoidal microsurgery. South Med J. 2001;94(11):1118-21.*
2. *Intraoperative cytologic diagnosis of suprasellar and sellar cystic lesions. Diagn Cytopathol. 1999;20(3):137-47.*
3. *Non-neoplastic cystic lesions of the sellar region presentation, diagnosis and management of eight cases and review of the literature. Acta Neurochir (Wien). 1999;141(4):389-97; discussion 397-8.*

Atlas of Neuro-ophthalmology

by

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(contd. from page 24)

Comparison of different tonometers with AT in literature and our study

Tonometers	Mean difference (SD) in mm of Hg with AT	95% limits (mm of Hg)
Proview (Our study)	-0.25 (3.02)	-6.16 to 5.66
TGDc (Our study)	1.3 (4.6)	-10.33 to 7.74
Pneumotonometer[1]	-1.3 (2.7)	-6.6 to 4
Dynamic Observing tonometer (DOT)[1]	2.1 (3.1)	-4 to 8.2
Tonopen[2]	0.8 (4.1)	-5.37 to 6.99
Pulsair 2000[3]	NA	-6.08 to 8.16

high as 5.66 mm of Hg or could be as low as -6.16 mm of Hg.

This instrument can find its use as a screening device or as a home monitoring device with further evaluation for influences of lid, scleral thickness etc. The issue of concern is that it is a subjective test which can influence the IOP reading.

For more information see the website 'www.bausch&lomb.com'.

Digital portable tonometer TGDc-01 "PRA"

Tonometer is assigned for measurement of intraocular pressure (IOP) through the patient's eyelid without any contact with the cornea and without anesthesia. The outer surface of the tonometer is resistant to chemical cleaning with hydrogen peroxide.

The tonometer (fig 2) has a movable rod which indents the sclera through the center portion of the upper lid near the ciliary edge and the IOP is recorded.. The IOP readings appear in the electronic reader of the instrument.

The initial comparison of the AT and TGDc done by Liberman OS et al shows that the mean IOP by AT and TGDc was 15.93 ± 4.66 and 15.81 ± 3.85 mm of Hg respectively in 48 glaucomatous subjects (personal communication).

Our study showed the difference in IOP between the two instruments could be as low as -10.33 or as high as 7.74 in 60 glaucomatous and normal subjects.

For more information contact 'info@applehcs.com'.

Fig 2 TGDc-01 Tonometer

Both these tonometers may serve different purposes in the clinical decision making in glaucoma with more validation.

References

1. *Morgan AJ, Hosking SL et al; Clinical evaluation of the Dynamic Observing Tonometer. Journal of Glaucoma 11:334-339.*
2. *Frankel REP, Hong YJ. Comparison of the Tono-pen and Goldmann Applanation Tonometer. Arch Ophthalmol 1988:106;750-3.*
3. *Mackie SW, Jay JL et al. Clinical comparison of the Keeler Pulsair 2000, American Optical MkII and Goldmann applanation tonometers. Ophthal Physiol Opt 1996; 16:171-7*

New tonometers under evaluation

R. Krishna Kumar and M. Baskaran

The intraocular pressure measurement (IOP) as we all know is influenced by various factors including diurnal variation, central corneal thickness, scleral rigidity and corneal pathology. There is constant search for better technology which can manage these flaws which are inherent in the Goldmann applanation tonometry.

There are two new tonometers namely, **Proview™ phosphene eye pressure monitor and Digital Portable Tonometer TGDc-01** which try to address some of these issues which may be of interest to eye care professionals.

Proview™ phosphene eye pressure monitor

Proview™ phosphene eye pressure monitor is portable and requires no anesthetic or skilled examiner. Invented by Bernard Fresco, an optometrist, the instrument relies on a phenomenon known as “phosphene”, recognized since Aristotle in ancient Greece. A phosphene is a sensation of light produced in the eye by something other than light. One can easily observe a phosphene caused by mechanical pressure on sclera by gently pressing with the finger on the eyelid. This pressure phosphene typically appears as a bright central area surrounded by a dark ring with an outer bright halo.

The Proview eye pressure monitor is a pencil like device, which contains a small flat probe, an internal spring, and a readable pressure scale. The IOP is measured through a half-closed eyelid by applying gentle pressure with the monitor in the upper portion of the eye near the nose (Fig 1). As soon as the patient sees the pressure phosphene ring, the indentation is stopped and the IOP can be read directly off the scale

Fig 1 Using the new Proview™ phosphene eye pressure monitor.

Dr. Fresco reported the comparative results of IOP measurements obtained in 100 patients by both the phosphene eye pressure monitor and the Goldmann tonometer. Dr. Fresco found that in 51% of the eyes the differences in the pressures measured by the two devices were within ± 1 mm Hg, in 74.9% within ± 2 mm Hg, and in 90% within ± 3 mm Hg.

Our study showed that the difference between IOP between the two instruments could be as high as 3.47 mm of Hg or could be as low as -3.39 mm of Hg in 30 myopic subjects. In 56 normal subjects the difference in IOP between two instruments could be as

(contd. on page 23)

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