

OPHTHALMOLOGIE

Referenten / Orateurs

Dr. med Corina Klaeger
Spezialärztin Ophthalmologie FMH
Gurtengasse 2
3011 Bern
eyedocs@bluewin.ch

Dr. med. Alain Munier
Spécialiste en ophtalmologie FMH
Avenue Beau-Soleil 22
1206 Genève
alain.munier@smile.ch

Dr. med. Pierre-André Repond
Spécialiste pédiatrie FMH
Ch. De Planta 35
1223 Cologny
prepond@hin.ch



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Schweizerische Gesellschaft für Pädiatrie
Società Svizzera di Pediatria

Corina Klaeger, Alain Munier

Ophthalmological Tips and Tricks for the Paediatrician

Abstract

This lecture will follow according to the child's age the important pathology and examination techniques in ophthalmology adapted for the paediatricians needs. In the newborn testing for cataract is mandatory. Glaucoma can also reveal soon after birth. Much more frequent is a neonatal conjunctivitis with or without tear duct obstruction.

In the first year of life a strabismus or a nystagmus can develop. Both can be benign or mean severe pathology. Early detection and referral to an ophthalmologist is important. Three different types of amblyopia exist with different time of onset and urgency to treat:

1. deprivation amblyopia
2. strabismic amblyopia
3. refractive amblyopia.

In the age group of 2-4years more sophisticated tests for strabismus are needed and also visual acuity testing is possible. The test of the red reflex from the fundus is very important to check for opacities in the lens or even foreign bodies in the cornea.

Finally there is a list of differential diagnosis for the red eye at any age with the appropriate treatment given.

The ophthalmological skills and knowledge of the Paediatrician are crucial for the timely diagnosis and treatment of a child's eye problems.

The important examinations, their technique and the clinical pictures are discussed following the child's age.

Newborn

The routine examination of the newborn must include a fundus reflex to test for any opacity in the lens or cornea. The direct ophthalmoscope is set on +2 and viewing through it, the light is shined on each eye at a distance of about ½ meter.

A cataract can be congenital and has to be removed as soon as possible, otherwise a *Deprivation Amblyopia* will develop. It is the most severe form of amblyopia.

There are 3 types of Amblyopia:

- | | | |
|--------------------------|---------------------------------|-------------------|
| 1. Deprivation Amblyopia | sensitive period 1 – 3 months | |
| 2. Strabismic Amblyopia | sensitive period 1 – 7 years | (discussed below) |
| 3. Refractive Amblyopia | sensitive period up to 15 years | (discussed below) |



- Deprivation Amblyopia

A deprivation means, that the retina, for any reason, does not get an adequate visual stimulation. The cause can be a haemangioma closing the eyelid, a congenital ptosis, a corneal opacity, a cataract, a vitreous bleeding etc. In this case an irreversible nystagmus will develop within 6-12 weeks. The amblyopia is very deep and already after a few months almost impossible to cure.

Age 0 – 3 months

- Conjunctivitis of the newborn / Tear duct obstruction

The gonococcal infection in our country has become so seldom that the traditional prevention with silver nitrate has become controversial because of toxic side effects to the cornea. It has been abandoned in most clinics in Switzerland.

The onset of chlamydial conjunctivitis is typically between the 2nd and the sixth week of life and may be associated with chlamydial pneumonitis. The best treatment for both is oral erythromycin. Still quite seldom.

The most frequent pathogens of neonatal conjunctivitis are gram-positive bacteria as Staphylococcus aureus and epidermidis, Streptococcus viridans and pneumoniae. Gram-negative organisms account for a small percentage of the infections. An effective therapy is topical Ofloxacin (Floxal®). Very frequently it is associated with a congenital tear duct obstruction, especially when there is tearing and there are recurrent infections after adequate treatment. In expert hands, probing the tear duct in the first 3-6months of life is a safe, very effective and causative treatment, which can be done without general anaesthesia. I prefer it to a long-standing infection, until the obstruction may or may not subside by the age of 1-2years. At that age general anaesthesia for probing is unavoidable.

- Congenital Glaucoma

Seldom but important to diagnose. Suggestive for glaucoma is a cornea larger than 11mm, especially unilateral, haziness of the cornea (test fundus reflex) and/or sensitivity to light. Abnormally small eyeballs (microphthalmus) are prone to cataract and glaucoma and are frequently hereditary.

Age 3-12 months

- Strabismus

A constant strabismus (same eye at all times) needs to be referred to the ophthalmologist at any age.

In the child Esotropia (eye turned inward) is much more frequent than Exotropia (eye turned outward), which is often a sign of neurological disease or a non seeing eye due to an organic pathology. Test for abnormal fundus reflex (retinoblastoma- although extremely



seldom). A strabismic eye will develop a strabismic amblyopia because of disuse (suppression). The suppression is an adaptation during childhood to avoid double vision. An adult with newly onset strabismus will suffer double vision. The strabismic amblyopia has a much longer lasting sensitive period than the deprivation amblyopia, up to about 7 years of age. It is nevertheless much easier and quicker to treat by occlusion of the good eye when detected early.

- Nystagmus

A nystagmus (jiggling eyes) will develop within about 3 months, when after birth an eye can not take up fixation because of organic pathology that lies somewhere in the anterior visual pathway, i.e. between the lids and the corpus geniculatum laterale. This nystagmus is called sensory defect nystagmus. The visual acuity must be reduced to lower than 0.4 for an eye to develop nystagmus. The cause can be a totally occluding lid haemangioma, a cataract, albinism, retinal pathology, optic nerve hypoplasia, chiasmal glioma etc. A cortical blindness does not produce nystagmus.

Therefore nystagmus needs to be referred to the ophthalmologist, too, to rule out a sensory defect in the anterior visual pathway.

There is also a benign congenital motor nystagmus without association to eye pathology, fairly good visual acuity (0.6 or more) and frequently combined with Esotropia. Often the children will show a head-turn to get the eyes in the best position to dampen the nystagmus.

Age 2-4 years

- Strabismus Test with Random-dot-Stereopsis

Continue to look for strabismus with the corneal reflex and cover-/uncover-test. Sometimes it is hard to see. Test the random-dot-stereopsis, e.g. the Lang-Stereotest-II-Card (a random-dot-stereotest) as early as possible. If a child has a good random-dot-stereopsis, strabismus is ruled out. There still can be an intermittent strabismus when the child is tired or ill, but this is much less urgent to treat. Even at a preverbal age the child can tip with its finger on the objects of the random-dot-stereotest. If the child cannot see the Lang-Stereo-Test, this can mean strabismus or a low visual acuity. With a high refractive error it is also impossible to see the stereotest because the dots are not in focus. A good result in the Lang-Stereo-Test does not rule out refractive amblyopia, which means a reduced visual acuity due to a refractive error. When the retina does not get a well focused picture, the eye will not learn to see properly. This is called a refractive amblyopia. The sensitive period of a refractive amblyopia is the longest, which means that we are in no hurry to treat it. We can wait until the age of 4 to get a reliable visual acuity test to detect refractive errors.

- Visual acuity testing



Good visual acuity tests are the Lea Hyvärinen Test in log units, the Stycar, the HOTV-Test or pictures for children. The tumbling E is less ideal because it is easier to see and gives somewhat too good results. Important is to be familiar with one's own test to get a feeling of what is normal. I recommend covering one eye with an occlusion plaster to be absolutely sure about the side that is being tested, and that no peaking through with the other eye is possible. At age 4 a child should reach a visual acuity of at least 0.6 symmetrical in both eyes. Children that cannot see 0.6 in either eye or show an asymmetry of visual acuity of 2 or more lines should be referred to an ophthalmologist.

- Fundus reflex

Continue to check the fundus reflex for any opacity in the cornea or the lens or for an abnormal reflex in the case of an intraocular tumour.

Reasons to refer to an ophthalmologist at age 2-4years:

- Negative Lang-Stereo-Test
- Manifest Strabismus
- Visual acuity worse than 0.6 or asymmetry of 2 lines or more
- Abnormal fundus reflex

At any age

- The red eye

The most frequent causes of the red eye include:

1. Conjunctival infection
2. Allergy
3. Foreign body
4. Corneal erosion/pathology
5. Blepharitis (lid margin infection) with hordeola
6. Iritis

1. Conjunctival infection

The hallmark of an infection is *discharge* with sticky eyes that have to be opened with the fingers in the morning. If you see real pus it is bacterial and antibiotic drops are indicated (e.g. Neosporin® or Floxal®). More often it is a viral infection with more watery discharge that gets sticky overnight. Frequently associated with a flue. Painful preauricular lymphnodes are highly suggestive of a viral cause, especially the keratoconjunctivitis epidemica. In viral conjunctivitis you can use disinfectant drops such as Rexophtal®. Viral infections of the conjunctiva are self-limited and heal in 1-2 weeks also without therapy. Please refrain from steroids. If an eye is red over weeks and months look for Mollusca contagiosa on the lids. To rule out corneal pathology the red reflex of the fundus is very



helpful to find any opacities or irregularities in the cornea. Chlamydia are a seldom cause for a very long-standing infection refractory to treatment.

2. Allergy

The hallmark of an allergy is bilateral *itching* with only watery eyes and no discharge. The conjunctival swelling especially after rubbing can be very impressive. Avoiding the allergic agent, antiallergic drops (e.g. Emadine®) and cool compresses will help.

3. Foreign body

The hallmark of a foreign body is *pain*. Blepharospasmus and light sensitivity are severe. The foreign body lies typically under the upper tarsus, so flipping the upper lid is the technique to know. A foreign body, especially metallic, can also be burned into the cornea. Again the fundus reflex will show the dark spot in the cornea.

4. Corneal erosion/pathology

You will have the same symptoms as with a foreign body. Again the red reflex of the fundus can show you the irregularity in the cornea. You can also use Fluorescein to make the erosion visible. Flipping the upper eyelid will make sure that there isn't a foreign body hiding under the tarsus and responsible for the erosion.

A corneal Herpes simplex infection can look like an erosion but is much less painful and has a history that develops over time. An erosion is an acute incident. If a patient once had a Herpes simplex rule out Herpes any time this eye gets red. Once Herpes, always Herpes.

5. Blepharitis/Hordeola

A Blepharitis is an infection of the eyelids. A red eyelid margin with lots of crusts on the eye lashes leads to the diagnosis. Often this is the cause for recurrent Hordeola. The typical bacteria are Staphylococcus epidermidis. Cleaning the eyelid margin and removing the crusts are the mainstays of therapy. Lid Care® - a disinfectant and detergent liquid - gives good results. In severe cases use additionally Fucithalmic®, an antibiotic with a good action against polyresistant Staphylococci. In hordeola you have to treat the underlying cause, i.e. the blepharitis. In children hordeola you just watch the evolution because they usually drain spontaneously. When pus is coming out use Fucithalmic®. It might resolve to a Chalazia, a non-inflamed lump in the lid. They, too, often resolve spontaneously over several months, so that a surgical intervention, which in a child would require a general anaesthesia, is not justified.



6. Iritis

The iritis of a child is a severe problem in juvenile chronic arthritis (JCA). Often the eye is hardly red, not very painful and the iritis goes unnoticed, if not specifically checked for in a child with JCA. The iritis can quickly lead to many destructive consecutive problems such as posterior iris synechia, cataract and glaucoma.

Think of iritis if an eye is red over several days without discharge, itching or foreign body pain and with a smaller pupil than the unaffected side. An iritis needs referring to an ophthalmologist.



WORKSHOP

OPHTHALMOLOGIE

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"Hands on eye tests and mistakes to avoid"

Untersuchungstechniken:

1. Beurteilung von Cornea und Linse im Rotreflex des Fundus (regredientes Licht)
2. Strabismustests (Lang-Stereotest, Cover-/Uncovertest)
3. Visustest

Therapeutische Massnahmen:

1. Ektropionieren des Oberlides zur Fremdkörperentfernung
2. Tricks zur Entfernung von subtarsalen und cornealen Fremdkörpern
3. Spülen der Augen bei starkem Kneifen

**Besprechung von Ophthalmologischen Problemen aufgrund von Publikumsfragen.
Discussion de problèmes ophtlamologiques présentés par les participants.**



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Hands on eye tests and mistakes to avoid

La lampe torche pour le test du reflet pupillaire peut être couverte par un personnage en plastique transparent, cela induit une composante accommodative qui aide à dépister un strabisme accommodatif.

Position du reflet par rapport à la pupille



Angle Kappa (entre l'axe géométrique de l'œil et l'axe visuel réel)

Si reflet au milieu de la pupille $K = 0$

Déplacement nasal  K positif

Déplacement temporal  K négatif

Les enfants ont tendance à avoir un angle Kappa positif.

Pour les ophtalmologues

Cover-Uncover test (éventuellement pour les pédiatres) \Rightarrow tropie.

Si pas tropie, alternate cover test \Rightarrow phorie

Test 4^Δ pour microstrabisme. ($< 10^{\Delta} - 2^{\circ} / \Delta$)

Stéréo-tests

Lang : random test
nécessite une bonne acuité visuelle de chaque œil $> 0.6 - 0.8$ et une perception visuelle simultanée des 2 yeux
avantage : pas de lunettes nécessaires
désavantage : visible avec un seul œil par les petits malins (faux négatif)

Titmus : grosse mouche facile à faire



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nécessite des lunettes polarisées
faux négatifs possibles

TNO : avec lunettes rouge-vert
pas de faux négatifs
on ne peut pas tricher

Adresse des fournisseurs

RYSER OPTIC
Hechtplatz und Multergasse 35
9004 St Gallen
Tél. 071 222 91 12
Fax. 071 222 41 62

(Prix : Lang, 108.35 FS – Titmus, 267.90 FS – TNO, 260.- FS)

TEST DE L'ACUITE VISUELLE

Age

0 à 6 semaines : fixe
6 à 12 semaines : suit

Test utilisé

Bébés : lampe torche pour tester la fixation puis la poursuite.

Notation :

- Prend la fixation
- Fixe et suit
- CSM (central, steady, maintained) par œil

C : regarde droit devant avec l'œil testé

S : absence de nystagmus

M : fixation maintenue lorsqu'on découvre l'autre œil, donc absence de strabisme manifeste.

Dès 3 ans : test à l'aide d'images pour chaque œil en cachant l'autre œil de préférence avec un patch autocollant (Opticlud).



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NB : à mon avis, plus facile qu'un cover test et révèle plus : strabisme, réfraction, opacité causant l'amblyopie.

Adresse du fournisseur

KAY PICTURES
P.O. Box 380
TRING, HERTS HP235 NL

Tél. 0044 14 42823507

Dès 5-6 ans: lettres ou chiffres de Snellen
dépistage en principe fait à l'école.

ERREURS A NE PAS FAIRE

- Larmolement chez un bébé de 6 mois traité comme un canal lacrymal bouché et qui était en fait un glaucome congénital bilatéral (avec buphtalmie symétrique)
- Larmolement chez un enfant de 3 ans qui était traité comme canal lacrymal bouché / conjonctivite chronique. La réfraction par skiascopie a révélé une hypermétropie à + 7 et évité un sondage lacrymal inutile . Le canal n'était pas bouché. et les lunettes ont suffi à le guérir.
- Fille de 8 ans, école privée, pas de dépistage. L'école a dit à ses parents de la mettre dans une école pour handicapés mentaux. Elle était seulement myope ; avec ses lunettes, elle a suivi une scolarité (publique) normale.



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Dieses Blatt wird am Ende des Kurses abgegeben / *Cette feuille est consignée à la fin du cours.*



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