

TACKLING UVEITIS IN PRACTICE

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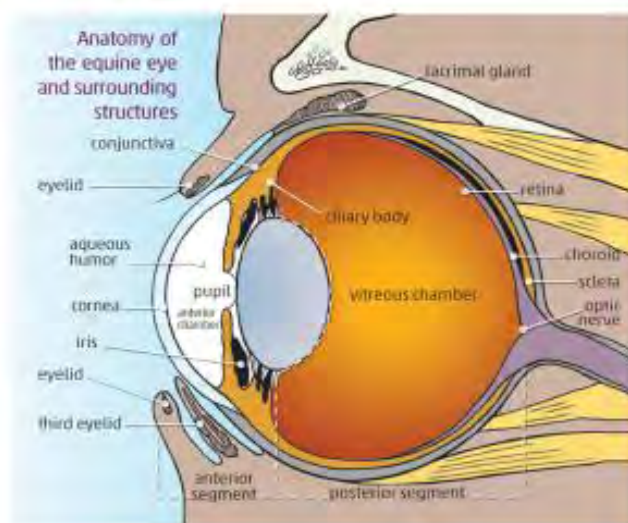
Tackling uveitis in practice

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Uvea / uveitis



Uveitis or ERU?

- Uveitis: a single event, no breed, age or sex predisposition
- ERU: repetition of several bouts of inflammation over several weeks, months or years, separated by periods of remission ('quiescence') without signs of intraocular inflammation
- Is this uveitis acute? chronic? recurrent? active? inactive ?

ERU classification

Classic	Insidious	Posterior
Active inflammatory episodes followed by periods of minimal ocular inflammation	Persistent low-grade intraocular inflammation without overt signs of discomfort (Appaloosa / draft horses +++)	Recurrent inflammation primarily in the vitreous, retina, and choroid

- Stage of chronicity

Acute / active	Quiescent	End stage
Actively inflamed eye with signs of intraocular inflammation	Comfortable eye. No clinical evidence of active internal inflammation	Blind eyes (phthisis bulbi) with possibly dense cataract, detached retina, luxated lens, and/or loss of normal pupillary architecture

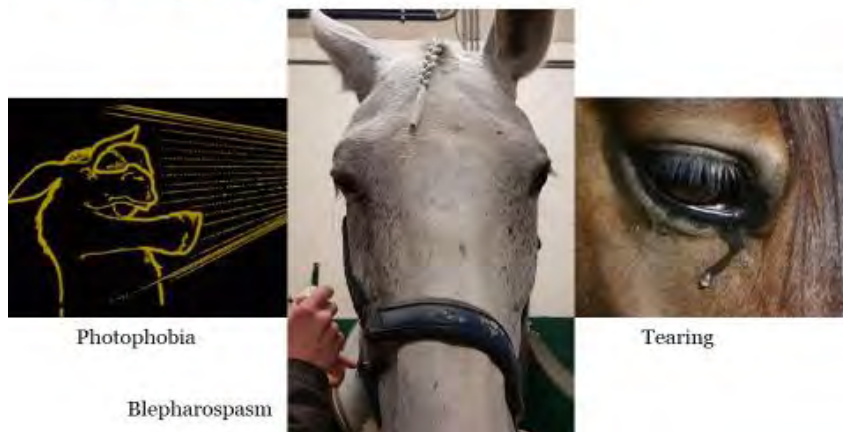
Acute uveitis: clinical signs

- Non specific signs: blepharospasm, tearing, conjunctival hyperaemia , episcleral congestion
- Specific signs:
 - Eyeball: hypotony
 - Cornea: keratic precipitates, oedema, neovascularisation
 - Anterior chamber: flare (Tyndall), hypopion, hyphema, blood/fibrin clots, synechiae
 - Iris: myosis, synechiae, inflammation, neovascularisation
 - Lens: capsular debris, cyclic membranes, synechiae / iris rests, cataract
 - Vitreous: haze, blood, fibrin, membranes
 - Fundus: inflammation of the ONH, hemorrhages, oedema, exudation

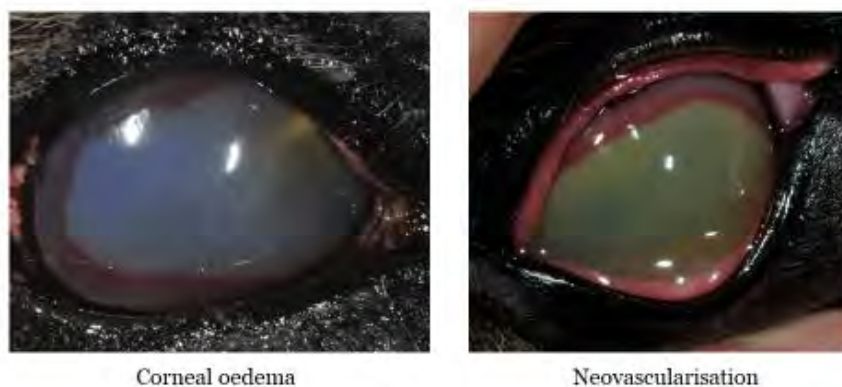
Chronic uveitis: clinical signs

- Specific signs :
 - Eyeball: atrophy, glaucoma
 - Cornea : vascularisation, dense oedema
 - Anterior chamber: 'iris bombé'
 - Iris: dyscoria, iris dull / dark, colour changes
 - Lens: luxation, cataract
 - Vitreous: 'liquefaction'
 - Fundus: retinal atrophy / detachment

Ocular signs



Ocular signs



Ocular signs

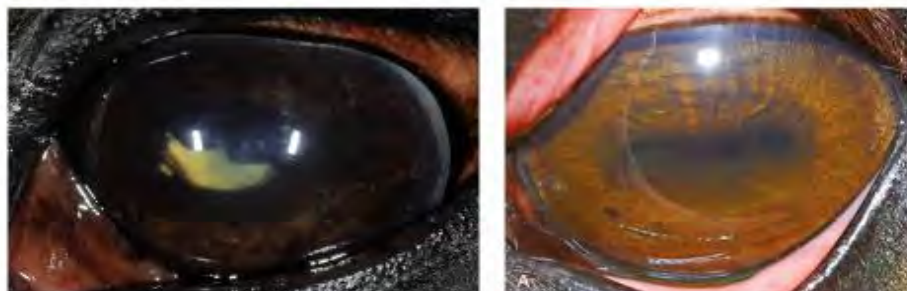


Keratic precipitates

Ocular signs: fibrin clots



Ocular signs



Myosis

12

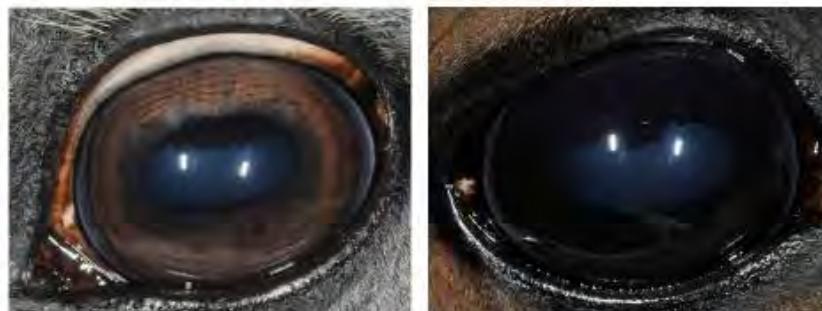
Ocular signs



Iris inflammation

13

Ocular signs



Normal iris

Dull / dark iris

14

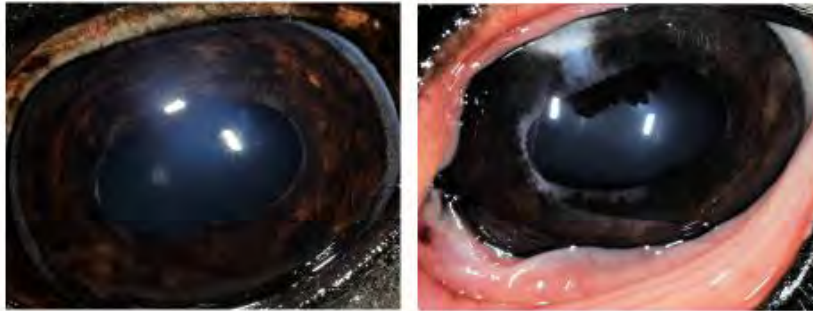
Ocular signs



Posterior synechiae

15

Ocular signs



Depigmentation of the iris margin
Corpora nigra atrophy

16

Ocular signs



Inflammation of the vitreous
Vitreous opacities

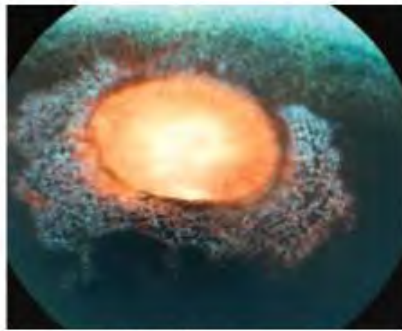
17

Ocular signs

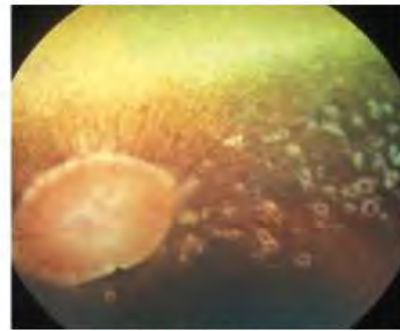


Cataract

Ocular signs



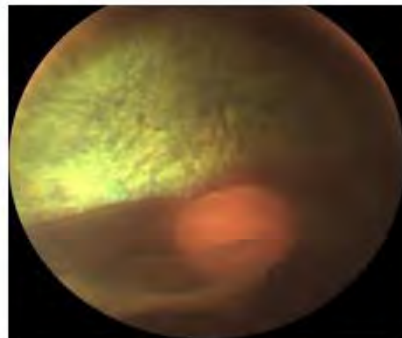
Butterfly lesions



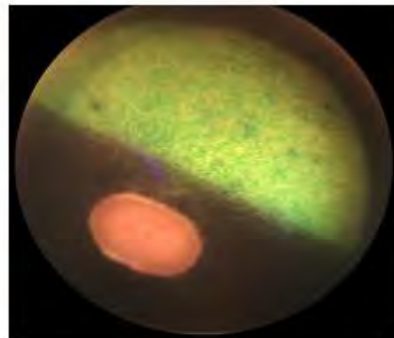
Bullet-hole lesions

Equine Ophthalmology, 3rd edition

Ocular signs



Retinal detachment

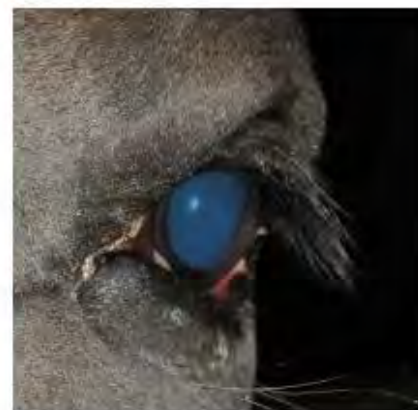


Normal fundus

Ocular signs



Normal eye



Eyeball atrophy

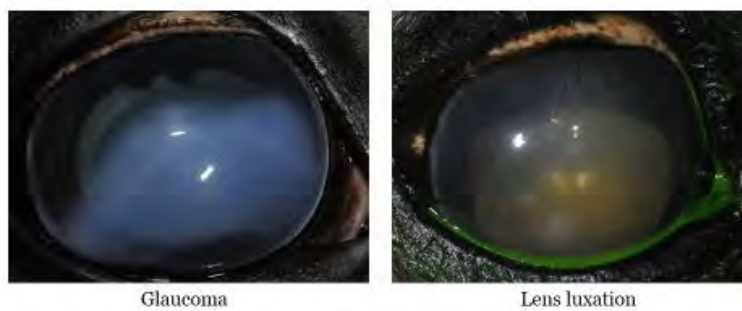
21

Long-term complications



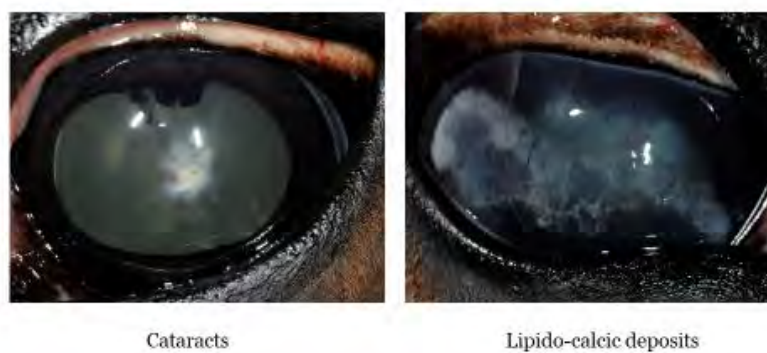
22

Long-term complications



23

Long-term complications



24

Diagnosis

- According to ocular signs (including reflexes and responses)
- IOP measurement (15-30mmHg = normal)
 - Aims : diagnosis and clinical follow-up
- Eyeball ultrasounds (prognosis)
- Fluorescein test
- Fundus examination

25

Differential diagnosis (?)

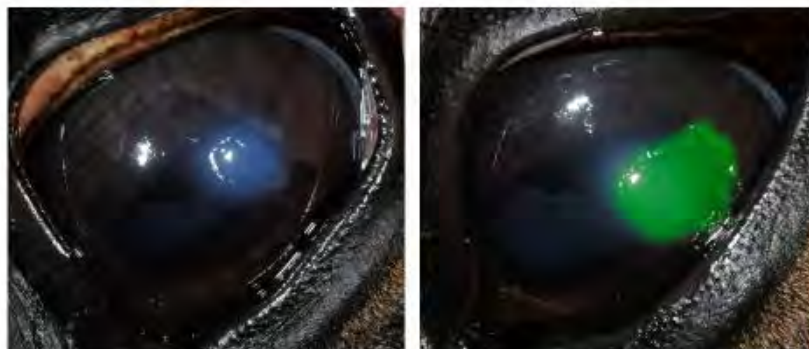
- Glaucoma



26

Differential diagnosis (?)

- Corneal ulcer



27

Differential diagnosis (?)

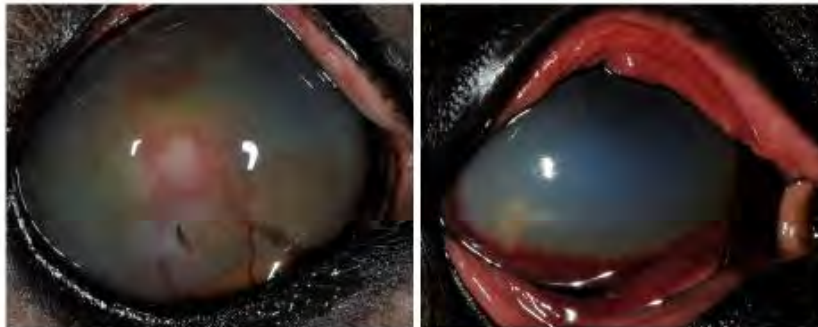
- Keratitis (IMMK)



28

Differential diagnosis (?)

- Corneal stromal abscessation



29

Etiology

- **Trauma**: blunt or penetrating injuries, intraocular surgeries...
- **Infectious**: *Leptospira*, *Brucella*, *Streptococcus*, *Rhodococcus*, *Eq influenza virus*, *EHV-1*, *Eq viral arteritis*, *Eq infectious anemia virus*, *Onchocerca*, *Toxoplasma gondii*, *Strongylus*...
- **Idiopathic**: immune mediated? Unidentified cause?
- **Other**: lymphoma, intraocular neoplasm, cataract, keratitis, tooth root / hoof abscesses, phacoclastic, etc...

30

Predisposition / risk factors

- Appaloosa, draft breeds, European horses
- Genetic markers in Appaloosa and German warmblood horses
- Coat color pattern (leopard horses) : light base coats and focal darker spots : more at risk
- Age (also coat becoming lighter with age)
- 20% to 95% of cases are bilateral
- No effect of sex (?)

31

Work-up

- Full physical examination
- + Blood tests
 - Hematology (CBC)
 - Biochemistry (liver / kidney)
- Blood serologies?
- FNA, radiography / US (skull, thorax...)
- Vitreous and aqueous humors analysis?

32

Work-up

- **Shall we search for Leptospirosis?**
 - Blood serology: not diagnostic
 - Malalana (2017) :
 - No difference in prevalence between ERU (65%) and control groups (42%), and between ERU lept+ (7%) and ERU lept-
 - No correlation between aqueous and vitreous humors
 - Different serovars according to studies / countries
 - *Pomona, grippityphosa, hardjo, bratislava...*

Work-up

- **Shall we search for Leptospirosis?**
 - Germany (Brandes, 2007) : 100% + (rtPCR)
 - Germany (Dorrego Keiter, 2016) : 35,1% (MAT)
 - California (Faber, 2000) : 70% + (rtPCR)
 - North Carolina (Curto, 2016) : 66,7% + (rtPCR)
 - South Carolina (Pearce, 2007) : 0% (rtPCR)
 - Louisiana (Polle, 2014) : 45% + (rtPCR)
 - UK (Malalana, 2017) : 6,7% + (MAT)
 - USA (south-west) (Gilger 2008) : 0% (rtPCR)
 - *BELGIUM (Sauvage, 2018) : 30,3% (rtPCR)*

Treatments: preserve vision, reduce discomfort, prevent

- Treat the cause!
- Long lasting treatments (>2 to 4 weeks after the end of the signs)
- Slowly taper the medication off
- 4 keys :
 - Systemic anti-inflammatory drugs
 - Topical anti-inflammatory drugs
 - Mydriatics / cycloplegics
 - Systemic antibiotics (?)

Systemic treatment

- Flunixinine méglumine (better than PBZ)
 - 1,1mg/kg BID for 2-3 days to 8 days then 1,1mg/kg SID for (>)7 days (then 0,55mg/kg SID for 7 days)
 - ! Gastric toxicity
 - ! Renal toxicity

36

Systemic treatment

- Dexamethasone (2.5-5mg/day IM) or Prednisolone (100-300mg/day IM or PO): for more severe cases (more side effects?)
- Aspirine, phenylbutazone, firocoxib : less efficient than flunixin meglumine

37

Local treatments



38

Local treatments

- Steroidal anti-inflammatory drugs:
 - Prednisolone acetate 1% (*Predforte*®)
 - Dexamethasone acetate 0,1% (*Maxidex*®, *Maxitrol*®, *Tobradex*®)
 - *Hydrocortisone* (*Terracortril*) : low penetration
 - Side effects 2res : slow down healing, potentiate infections / melting / lipido-calcic deposits
- Non-steroidal anti-inflammatory drugs :
 - *Ketorolac* (*Aculare*®)
 - Not as potent as SAIDs
 - Few side effects: slow down reepithelialisation

Local treatments

- Cycloplegic / mydriatic: 1% Atropine:
 - Duration of action : >2 weeks in healthy horses
 - Reduce myosis and ciliary spasm
 - Reduce risks of posterior synechiae
 - 1 to 4 x/day (then to effect)
 - ! Appetite, lethargy, gut motility, colic
- If the pupil does not dilate:
 - Useless to increase concentration or frequency
 - 10% phenylephrine: useless on its own, use in combination with atropine (3-4x/day)
 - Try to better control inflammation

Other treatments



- Sub-conjunctival injection of long acting (methylprednisolone, triamcinolone): in case of severe uveitis, to initiate therapy (Duration 10-20 days)
- Intracameral injection of tPA: usefull?, risk of contamination / bleeding
- Intra-vitreous injection (gentamycine 4mg +/- dexamethasone 1-2mg or triamcinolone 5-10mg)
- Cyclosporine A : poor eye penetration

Antibiotics? Other?

- In case of Leptospirosis:
 - Doxycycline : 10mg/kg per os BID 4 weeks
 - Enrofloxacin : 7,5mg SID per os 3 weeks or 7,5mg/kg IV 10 days
 - Empirical treatments ...
- Vaccination: efficacy not yet fully proven
- Avoid contact with non vaccinated herds, pond water, reservoirs (rats, swine, cattle, deer)...

Severe uveitis: treatment example

- Maxitrol® :
 - QID 15d, TID 15d, BID 1 month, SID 1 month or longterm
- Aculare® :
 - QID 15d, TID 15d, BID 2 months, SID longterm
- + 1% Isopto-atropine® :
 - BID to TID 24-48h, SID 5-7 days then "to effect" until inflammation is under control and mydriasis is obtained
- + 10% Phenylephrine Minims® :
 - If response to atropine is inadequate, BID 5-7 days. Stop as soon as mydriasis is obtained (carry on with atropine only)

Long-term medication...

- Consider daily topical treatment:
 - Atropine: 1x /week
 - Local NSAIDs: 1-2x/day
- Numerous re-assessments:
 - After 2 weeks
 - After 1 month
 - After 2-3 months
 - After 6 months, every 6 months (insidious uveitis!!!)

Surgical treatments

- Objectives :
 - Pain control
 - Limitation of crises number / intensity
 - Preservation of vision
- Importance of Lepto status:
 - Consensus: sample both (if possible) AH and VH for PCR and/or MAT
 - Choose treatment according of results:
 - Vitrectomy / CsA implant / Intraocular injections

Surgical treatment: enucleation

- With / without intraorbital prosthesis
- Intrasccleral prosthesis



Surgical treatment



Gilger, 3rd edition

- Subchoroidal CsA implant
- Lepto- only!
- Inflammation controlled for 3 to 4 years
- Significant reduction of crisis number, better visual prognosis (especially for Appaloosas)
- 70% of implanted horses are visual after 5 years (Gilger 2010)
 - *In inactive phasis*
 - *Case selection:*
 - *Horses medically controled*
 - *Horses with frequent / early recurrence (after treatment is stopped)*

Surgical tratment



Gilger, 3rd edition

- Vitrectomy (*pars plana*)
 - Posterior uveitis
 - Only if anterior chamber and lens are transparent
 - Mainly performed in central Europe (Germany, Austria, Switzerland)
 - Lepto + partients are better candidates (80% success)
 - Recurrence rate is high in Lepto – patients : 83%
 - Complications: hemorrhages, retinal detachment, cataract (Winterberg 1997, 70% visual after 5 years, 42/43 without uveits BUT 19 cataracts, 6 atrophies, 4 detachments)
 - Prognosis: (Spiess, 2010) : 73% without recurrence of uveitis, 22% of persistent ERU

Conclusion

