



Suspected Peters Anomaly in free living Red Deer

**Alex Barlow, VLA Wildlife Group, Great Britain
Catriona Gaudie, VLA Thirsk**

**Veterinary Deer Society Conference
10th – 11th November 2010**

Background and Description of Peters Anomaly

- Peters anomaly was first described in Humans in 1906 by a German Ophthalmologist, Dr Alfred Peters.
- Affects the eyes of people of both genders and from all ethnic groups.
- A rare abnormality of ocular development of early pregnancy (10-16 weeks).
- The central part of the cornea is hazy and white and one or both eyes may be affected.
- It is characterized by;
 - central corneal opacity due to corneal endothelium with an adherent corneal leukoma
 - usually accompanied by the adhesion of strands of iris tissue to the margins of the opacity
 - thinning of the stroma
 - attenuation or absence of Descemet's membrane.
- The drainage angle of the eye, may be underdeveloped, with a risk of Glaucoma.
- The cause is unknown.
 - Genetic factors
 - Environmental/Toxic factors
 - Or both may be involved
- Most human cases are sporadic or autosomal recessive.

Thorne Moor, Yorkshire



Thorne Moor

- Conservation site of approximately 500 acres owned and managed by Natural England, which is of international importance as a wildlife habitat.
- Originally used for industrial peat extraction.
- Conservation efforts have led to the re-establishment of bog cotton, heathers, sphagnum mosses and suchlike within the naturalised peat bog.



Thorne Moor

- Two substantial areas of wet woodland within the conservation area and these consist predominantly of willow, rowan, birch and some hawthorn.
- Throughout the area there is a network of drainage ditches and wide drainage channels.
- Surrounding farmland consists of rich alluvial silt and is prime intensive cereal growing soil.
- The red deer roam freely but mainly inhabit the areas of wet woodland and have access to all the peat bog and also the surrounding farmland.



Deer Herd

Originated from a small deer farm, which were released on to the moor during the mid-1970s

- original population of about 25 animals
- poaching and legitimate culling by local landowners occurred but little information is available before 2000

After 2000 more active interest was taken in the red deer due to the re-establishment of the natural peat bog.

2007 population estimated to be at least 80 animals

- deer management group was established to better control numbers
- the herd were now damaging the fragile ecosystem also causing significant detrimental effects on local farms
- four dominant stags were removed

2008

- three more stags were culled
- limited culling of hinds has also been instigated

Present

- deer population is now about 50



Clinical History

2001:- Blind young deer was observed

- Every year since then one or two similar animals have been recorded
- The problem appeared to peak in 2007 when five such cases were recorded

November 2007:- Head of a young male red deer to VLA Thirsk

- Vague nervous disease problem
- No diagnosis reached

August 2008:- Carcase of a 40 kg male deer calf

- very good body condition
- Appeared blind and possibly also had hearing problems
- Animal had been shot in the head, eyes were unaffected by the physical trauma
- Milk clots were present in the abomasum.
- Bilateral flattening of eyes to the caudal chambers in a craniocaudal orientation.
- Synechiae were seen in the anterior chambers
- No lens was present in either eye
- Thin strands of fibrous tissue in both eyes between the cornea and vestigial iris structures

August 2009:- Carcase of a two month old female red deer calf

- Good bodily condition
- Euthanasia due to apparent blindness
- Eyes were normal size
- Slight corneal capacity to the right eye
- No pupil or iris could be differentiated in either eye
- Anterior chamber of both eyes had a matt black irregular appearance

Eyes:- Gross Pathology



Histopathology:- 2008 case

- Absence of Descemets membrane
- Corneal endothelium was replaced by retinal pigmented epithelium.
- Anterior and posterior chambers of the eyes were separated by an artefactually discontinuous fibrovascular septum covered in pigmented cuboidal epithelium
- Vestigial iris and ciliary body present in both eyes
- large polypoid projection of fibrovascular connective tissue projecting into the vitreous humour
- No lens was present in either eye

Morphological diagnosis:-

Severe ocular dysplasia with aphakia

Histopathology:- 2009 case

- Irregular shaped globe with coning of the cornea
- Cornea variable thickness with multifocal moderate hyperplasia of corneal epithelium
- Corneal endothelium replaced by a variably thick layer of pigmented cells and fibroblasts type cells
- Iris and ciliary bodies appeared vestigial
- Associated with convoluted folded cuboidal epithelial extensions into aqueous humor forming cyst like cavities
- No lens was present in either eye

Morphological diagnosis:-

Severe ocular dysplasia with aphakia

Consultations

Mr John Mould (specialist veterinary ophthalmologist)

Mr John Fletcher

Dr Hugh Reid

Conclusions

• **Diagnosis of Peters Anomaly**

• **Large size deer due to ideal conditions;**

- Wet woodland for daytime retreat and rich farmland for night-time raiding

• **No similar problems in other animals in the area;**

- Unlikely to have a toxic or environmental cause

• **Thorne Moor deer are probably extremely inbred;**

- No other red deer in area
- Entire population may have originated from just one stag in the most extreme scenario

• **Eye anomaly may be more widespread than originally suspected;**

- e.g. if seven or eight cases were seen when the herd was thought to be approximately 80 strong
- 30 to 35 breeding females would be present
- up to 25% of calves were affected

Advice

Culling

- Deer numbers are suspected to be much higher than originally estimated.
- Wider culling policy is required to get the herd to an acceptable size.
 - for protection of conservation areas
 - and surrounding farmland

New blood

- Holding facility for new stags to allow “soft” release.
- Selected stags to cope with large resident stags.
- Introduce new stags at a time when the stags are quiescent and away from hinds.
- New stags ear notched or tagged to prevent them being culled by accident.

Suspected Peters Anomaly in free living red deer

Acknowledgments

- **Chris Evans, Natural England, Reserve Manager**
- **John Mould MRCVS, Eye Veterinary Clinic, Herefordshire**
- **Dr John Fletcher MRCVS, Deer Management Consultant**
- **Dr Hugh Reid MRCVS, Moredun Research Institute**
- **Staff at VLA Thirsk**