



# LANSDOWN VETERINARY SURGEONS

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## **Successful removal of bilateral cataracts from a Siberian Eagle Owl**

The lens of the eye is a transparent, bloodless structure whose role is to focus light rays on the retina (the part of the eye which detects light and then transfers messages about the image it sees to the brain). The lens is not a rigid or immobile structure, instead it has an ability to change shape, (being squeezed from it's outer ring), such that it can bring images from different distances away into focus on the retina, this function is termed accommodation.

If a lens is no longer transparent, it is often because a 'cataract' has developed within the lens rendering the bird partially or totally blind. Cataracts vary in size from pin spots to large opacities encompassing the whole lens.

Cataracts are classified according to the age of onset as congenital, developmental or juvenile and senile. Congenital cataracts are present at birth, they may be inherited, caused by a toxic insult, or an embryonic disorder occurring during incubation.

Developmental cataracts occur before middle age, most of these have been found to be inherited in species in which sufficient research has been carried out. Senile cataracts are perhaps the commonest form of cataract in birds occurring in aged birds.

Cataracts have been found in birds associated with skeletal abnormalities, genetic disorders, nutritional deficiencies, infection, trauma, senility, toxic effects and more localised eye disease. Vision loss is proportional to the size and location of the cataract. Amongst birds of prey cataracts are seen most commonly in diurnal birds. However amongst free living birds of prey cataracts are found most commonly in owls and are generally thought to be congenital (ie present from birth but not necessarily hereditary) or to be traumatic in origin.

Treatment of cataracts inevitably involves surgery. However before surgery is contemplated it is vital that one attempts to elucidate the cause of the cataract. Furthermore the final outcome, if surgery is successfully completed, should be considered, and whether this result is sufficient to at least allow the bird a good quality of life, let alone performing it's previous function usefully. Needless to say the technique is very intricate, requiring considerable expertise, modern high tech equipment, and is not cheap, so financial viability should also be considered.

As stated above most bird cataracts are considered to be developmental, as such they may well be hereditary. One would never advise the subsequent breeding from a bird, following cataract surgery, unless the species was genuinely very rare, and even then one would monitor any offspring very carefully and keep them under your control, until one was at least certain that

they did not show any signs of cataract development.

From the point of view of flying, one has to accept that a bird post cataract surgery, will not have as good a focusing ability as it did before, (in particular at speed). Whilst a post cataract bird may fly around a familiar aviary or flying ground, one would not expect it to ever fly it at display, quarry and one would certainly never contemplate releasing such a bird to the wild.

Some cataracts develop as a consequence of infection (eg avian leukosis, salmonellosis, Newcastle Disease Virus and other similar infections) or metabolic abnormalities within the bird. Any bird should be thoroughly screened for concurrent diseases before surgery is considered.

There is also no value in performing cataract surgery on a bird whose retina (the sensitive part of the eye) is not functioning normally. If you were to do this, although the eye would look better, the bird would not benefit from any return of sight. On some occasions tests can be conducted with standard ophthalmic instruments to verify if an eye is functional prior to surgery, in other cases one needs to perform 'retinography'. The latter technique measures nerve impulses arising from the retina, without having to actually be able to see the retina.

The case with which we were interested was a Male Siberian Eagle Owl named Boris, who was suffering from large dense cataracts affecting all of the lens in both eyes, such that he had no sight. Any readers in the know will appreciate that Boris is indeed a very rare creature, and worthy of effort from all concerned in the hope that his eye sight might be restored.

Following all the necessary tests to ensure that Boris was in all other respects a normal healthy bird, cataract surgery was contemplated. Boris was referred by his local vet, to Paul Evans of the Eye Veterinary Clinic in Leominster who is regarded as one of the top veterinary cataract surgeons in the country, who in turn was assisted from the avian and anaesthetic side of things by avian specialist vet Neil Forbes from the Clockhouse Veterinary Hospital in Stroud.

Cataract surgery has advanced to a very highly technical and specialist field, requiring large amounts of state of the art equipment, a very steady pair of hands and nerves of steel. The method that is best employed is one which is termed 'phacoemulsification'. For this technique the bird requires not only a general anaesthetic, but also 'muscle relaxant' medication. Muscle relaxants are drugs similar to 'Curare', as used in the arrows of the Amazon Indians, to paralyse their quarry. This is necessary to immobilise the eye, and in particular the third eyelid, so that it does not interfere with the delicate surgery, which will take place. However if curare is used, all the muscles of the body will be paralysed, so that the bird cannot breathe for itself, and the anaesthetist will have to breathe artificially for the bird during the operation. Moreover, the normal reflexes which are used to monitor the depth of a bird's anaesthesia (the respiratory rate and depth, the blink reflex), are all destroyed. The only reflex left is the heart rate, so the anaesthetic monitoring and control becomes much more difficult. One can appreciate why one needs not only good ophthalmic surgeon, but also a good bird anaesthetist, for this procedure. A dead bird with wonderfully removed cataracts is no use to anyone except a taxidermist.

So the day before surgery was planned, Boris arrived and was settled into his hospital accommodation with Paul Evans. With Boris being such a rare owl, a considerable press interest had arisen, such that the next day the whole premises was engulfed with television crews, newspaper reporters etc. The story as a whole should appear later in the year on 'Rolf's Amazing Animals'. Neil arrived as planned late morning, and gave Boris an examination before inducing anaesthesia. Once Boris was asleep, he was given intravenous fluid therapy to help him cope with the stress of surgery and a long anaesthetic, as well as pain killers and antibiotics. A tube was then placed through his flank into his air sac, so that he could be anaesthetised throughout the operation via his flank, rather than via his wind pipe. This type of anaesthesia (air sac perfusion anaesthesia), is reported to allow dilation of the pupil, which assists in cataract surgery, although in Boris's case, insufficient dilation was achieved, and the curare (muscle relaxation) was still required. Boris was set up for surgery, with wires and tubes trailing from all parts of him. Paul, using an operating microscope to facilitate very accurate detailed surgery, then made a single small (2mm), hole in the front (cornea) of the eye. The lens itself is held within a capsule (rather like an envelope. The capsule on the front of the lens is first removed, then the phacoemulsification probe is inserted into the eye. In simple terms, this highly complicated piece of microtechnology is similar to a 2mm kitchen whisk, with a vacuum cleaner fixed around the outside of it. The whisk breaks up the lens into a soup, which is then sucked up by the vacuum.

It is very important that all the lens material is removed, as any residual protein can give rise to inflammation in the eye following surgery.

So with anaesthetic and curare administered Paul operated first on one eye (taking half an hour for the actual operation), once the cataract is removed, the small incision is sutured closed, at the same time burying the suture knot within the thickness of the cornea, so that it does not cause any irritation. Then following a repeat curare injection the cataract was also removed from the second eye. The whole operation took two and a half hours, however only ten minutes following surgery Boris was standing and blinking at his large and impressed press entourage.

Following surgery, birds do not instantly see everything they have been missing for all this time. Initially they will tend to see shapes, movement and light, and it is only later that they start to learn to focus without the benefit of a lens. Their sight will never be perfect, but their quality of life will be greatly improved, and if relevant they may well see well enough to breed from.

Surgical correction is not the solution for every bird with cataracts, future quality of life, function, and cost all need to be considered. However for Boris we all wish him a very happy, long and hopefully fruitful life with his regained sight.



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