SURGICAL MANAGEMENT OF SOME OCULAR AFFECTIONS IN DOMESTIC ANIMALS

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ABSTRACT

The present study was carried out between November 2004 and April 2008 on 184 animals (122 cattle, 27 buffaloes, 12 horses, 7 donkeys, 11 sheep, 2 goats, and 3 dogs) suffered from different ocular affections. The animals were examined at private farm stations at Dakahlia Province, during field training trips beside those animals admitted to the surgery clinic of the Mansoura Teaching Hospital of the Fac. of Vet. Med. at Mansoura University. Case history, general health condition and examination of each ophthalmic affection were recorded. Also, age, sex, breed and description of all lesions were reported. The recorded affections included, 8 congenital, 108 acquired and (68 neoplastic affections*). The recorded congenital ocular affections were cyclopia (a kid), dermoid (2 calves), unilateral strabismus (2 mixed breed calves), bilateral convergent strabismus with exophthalmos (2 Holstein cows) and a unilateral anophthalmia and microphthalmia in a native breed calf. The acquired ocular affections were recorded in 108 animals (56 cattle, 26 buffaloes, 11 horses, 2 donkeys, 9 sheep, 1 goat and 3 dogs). These included conjunctivitis (37 cases), infectious bovine keratoconjunctivitis (21 cases), keratitis (14 cases), lacerations of the eyelids (12 cases), perforating corneal wounds (4 cases), ocular proptosis (3 cases), hyphema (2 cases), foreign body in the cornea (2 cases), punctured wounds of the eyelids (2 cases), and one case of each of the following affections: ruptured sclera, hypopyon, cataract, panophthalmitis, nodular conjunctival lesion after lumpy skin disease, acquired buphthalmos, nictitating gland prolapse, subconjunctival lower eyelid abscess, subcutaneous upper eyelid abscess, bilateral prolapse of the third eyelid, and blepharitis.

(*) Ocular neoplasia were previously published in a separate paper.

INTRODUCTION:

The ocular defects reported in cattle were congenital cataract, dermoids, congenital glaucoma, persistent pupillary membrane, corneal edema,
anophthalmia and strabismus, while in buffalo heterochromia was the main one followed by strabismus (Ahmed et al., 2000). The most common ocular affections recorded in cattle, buffaloes, and sheep were conjunctivitis, keratitis, subconjunctival abscess, and prolapse of the nictitating glands, hyphema and cataract (Misk, 1993). Faulty differentiation of tissue during ocular development can produce a dermoid characterized by a mass of normal skin in an abnormal location. The anomaly occasionally develops along the eyelid margin and within the palpebral conjunctiva at the lateral canthus, although the temporal perilimbal conjunctiva and cornea are more typical locations (Radostitis et al., 2007).

Bilateral convergent strabismus with exophthalmos (BCSE) is an eye disorder affecting many breeds of cattle. The defect is heritable and relatively of high incidence particularly in Holstein and German Brown cattle (Power, 1987, Distl and Gerst, 2000; Vogt and Distl, 2002 and Momke and Distl, 2007). BCSE causes economic losses from the animals' decreased marked value and the fact that their progeny cannot be used as breeding animals (Distl and Gerst, 2000).

Lacerations of the eyelids are common in horses (Gelatt and Wolf, 1988). Traumatic injury to the cornea may be superficial or deep enough to cause lacerations of the epithelium and/or stroma and in some cases to the deeper structures in the eye.

Lesions involving the full depth of the cornea are complicated by collapse of the anterior chamber and bleeding may occur due to deeper damage involving the iris (Knottenbelt and Pascoe, 1994).

Prolapse of the nictitans gland (cherry eye) may be caused by inherent instability of the connective tissue which anchors the gland at the base of the third eye lid, (Ward, 1998). It may also be a direct consequence of chronic glandular hypertrophy (Crispin, 2005). The nictitating membrane of large animals is frequently affected by neoplasms, malformations, foreign bodies and inflammations (Gelatt and Wolf, 1988). It was affected also by subconjunctival abscess, dermoid (Youssef et al., 1993), granulomas and abnormal protrusion (Abd El-Aal et al., 1997).

The objectives of the present study were to through light on different ocular affections in some domestic animals and their incidence in Dakahlia Province and finally to evaluate the role of surgical management for treatment of the operable ones.

MATERIALS & METHODS

The present study was carried out between November 2004 and April 2008 and it was performed on 184 animals (122 cattle, 27 buffal-
oes, 12 horses, 7 donkeys, 11 sheep, 2 goats, and 3 dogs) suffered from different ocular affections. The animals were examined at private farm stations at Dakahlia Province, during field training trips beside those animals admitted to the surgery clinic of the Mansoura Teaching Hospital of the Fac. of Vet. Med. at Mansoura University. Case history, general health condition, physical examination were recorded. Also, age, sex, breed and description of all lesions were reported.

**Anesthesia:**
Xylazine hydrochloride (Xylaject, ADWIA, A.R.E.) was used for sedation of cattle, buffaloes, sheep (0.05 mg/kg b.w.) and goat (0.01 mg/kg b.w.). This was followed by infiltration anesthesia using lidocaine HCl (Debocaine, El-nasr Pharma. chemicals Co. for Al-Debeiky Pharma-A.R.E.). Retrobulbar injection was performed according to (Riebold et al., 1995).

Topical anesthesia using Benoxinate Hydrochloride (Benox 0.4%, EIPICO, A. R. E.) was also used. Chloral hydrate deep narcosis was sufficient for equines in a dose of 6 gm /50 kg b.w., 10% I.V. injection. General anesthesia using thiopental sodium 2.5% was administered in dogs which were premedicated with atropine sulphate (0.04 mg/kg b.w.).

Enucleation of the entire globe in cattle, buffalo and dogs was performed according to (Kumar, 1996) in cases of panophthalmitis, acquired buphthalmos and irreducible eyeball prolapse. Samples of congenital dermoids as well as encapsulated abscesses were fixed in 10% neutral buffered formalin and histopathological processing was performed according to (Bancroft and Stevens, 1996).

In case of iris prolapse, the unhealthy protruded part of the iris was amputated and the corneal wound edges were apposed with simple interrupted sutures using 5/0 silk. A nictitating membrane flap was then performed (Fig.1). Also perforating corneal wounds were operated in the same aforementioned manner. Scleral rupture was closed also in a simple interrupted manner using 5/0 silk.

Eyelid lacerations were closed using a two layer technique with interrupted absorbable sutures (2/0 chromic cat gut) in the eyelid stroma and silk in the skin. Punctured eyelid wounds were cleaned with normal saline followed by soaking with an intramammary infusion tubes (Terrexine, Univet, Ireland) three times daily without suturing. Encapsulated subconjunctival abscess was totally excised, while the ripened subcutaneous eyelid abscess was opened and drained on the usual manner. Surgical correction of nictitans gland prolapse (cherry eye) in dogs was performed using the pocket inversion technique according to (Crispin, 2005). Following general anesthesia; the third eyelid was everted by application of two Allis tissue forceps at its free
border. A curved incision was made parallel to the free border of the third eyelid, proximal to the prolapsed gland. A second curved incision was made distal to the prolapsed gland. The gland was covered by suturing the proximal edge of the first incision and the distal edge of the second incision together, effectively by burying the prolapsed gland in a pocket after application of a simple continuous suture using 5/0 vicryl (Fig.2). Congenital dermoids were surgically excised and the wounds were closed with interrupted sutures using silk except at the conjunctiva (left without suturing). Conjunctivitis cases were treated by flushing the eye with boric acid 2%, followed by application of a combination from (Dexamethazone 0.1%, Neomycin sulphate 3.5 mg/ml and Polymyxin B sulphate 6,000 units/ml ;ISOPTO MAXITROL , eye drops, Alcon –Belgium), 4 times daily.

In cases of keratitis and infectious bovine keratoconjunctivitis, subconjunctival injection of 100 mg of oxytetracycline dihydrate (2 ml of Uvomycin , Intervet-A.R.E.) under the bulbar conjunctiva was used after flushing the eye with either normal saline or boric acid 2%. Injection of each eye was performed in bilateral cases. Repeated injection for unresponded cases was done after a week. Hyphema was treated by application of epinephrine solution 2% for the first day after trauma. Atropine sulphate 1% was applied 4 times daily to dilate the pupil until hemorrhage has disappeared.

**Aftercare treatment:**
Broad spectrum antibiotics were injected for 5 successive days as well as flunixin meglumine (1 mg/kg B.W.) for 3 successive days. Sutures were removed two weeks later and a prophylactic dose of antititanic serum was subcutaneously injected in equines, sheep and goat.

**RESULTS**
In the present study, 8 animals (2 cows, 5 calves, and one kid) were suffered from congenital ocular affections (Table:1), while 108 animals (56 cattle, 26 buffaloes, 11 horses, 2 donkeys, 9 sheep, 1 goat and 3 dogs) were affected with different acquired ocular affections as showed in (Tables: 2 & 3). Different types of ocular neoplasia (68 cases) were previously published.

The congenital ocular affections were cyclopaia, dermoid, unilateral strabismus (squint), bilateral convergent strabismus with exophthalmos and a unilateral anophthalmia and microphthalmia in the same animal.

One day old kid was born with one eye present in a centrally located orbit. The tongue was directed outside and upwardly between the jaws against the left side of the head. The upper jaw was short while the lower one was
normally developed. This case was diagnosed as cyclopia associated with prognathia (Fig.3). The animal was died in the second day after labour.

Ocular dermoid was recorded in two cases, one Holstein calf and a native breed one. In the first calf (male, 4 months old), the dermoid was arisen at the medial canthus and it involved the palpebral conjunctiva and the third eyelid. It caused irritation to the animal, lacrimation and conjunctivitis which were caused mainly by its location and long coarse hairs above the abnormal mass (Fig.4). The second case was born with 4 skin-like masses of tissue with presence of numerous long hairs on their surfaces. Two of them were protruded from the right and left nose (Fig.5-A) and they caused noise during air inspiration. The third dermoid was present along the margin of the left upper eyelid near the medial canthus (Fig.5-A&B).

The fourth one was the smallest and it was present at the palpebral conjunctiva of the left lower eyelid (Fig.5-B).

Surgical excision of the masses was done where the animal was 30 days old (Figs.5-A&B and 6-A). Histopathological examination was done for the third and fourth masses only. It revealed presence of a unilocular cyst within the dermis. Multiple pilosebaceous units connect with the cyst (Fig.6-B). The surrounding dermis is mildly fibrotic. The cyst was lined by stratified squamous epithelium and contained eosinophilic keratinous mass in its lumen. There was no recurrence of the operated masses until 4 months observation (Fig.6-C).

Strabismus was recorded in 4 cases. Two mixed breed calves were affected with unilateral convergent (esotopia) strabismus (Fig.7). Their ages were 6 and 8 months old. The affection was accompanied with exophthalmos with rotation of the eyeball inward and medially.

This interfered with animals' vision and affected on their temperament. Two Holstein cattle were affected with bilateral convergent strabismus with exophthalmos (BCSE). There was a permanent rotation of both eyeballs in an anterior medial direction in the two cows (Fig.8).

A native breed male calf was born blind. The left eye was small in size and there was enophthalmos. The third eyelid was protruded and the palpebral fissure was reduced in size (Fig.9-A&B). In the right, eye the upper and lower eyelids were formed and they had normal eye lashes but there was no palpebral fissure and the eyeball was filled with undifferentiated tissue (Figs. 9 A&C).

This case was diagnosed as unilateral anophthalmia and microphthalmia.

Eyelids were affected with lacerations, blepharitis and subcutaneous abscess. Traumatic lacerations of the upper eyelids were recorded in 8 animals (2 cows, a horse, 4 foals & a donkey) while they were recorded in four animals (2 cows & 2 foals) in the low-
er eyelid. All the recorded cases were caused by mechanical objects as nails, hooks and barbed wire (Fig. 10).

Table (1): Illustrated types of congenital ocular affections in domestic animals.

<table>
<thead>
<tr>
<th>Type of congenital affection</th>
<th>Cattle</th>
<th>Buffalo</th>
<th>Equines</th>
<th>Sheep</th>
<th>Goat</th>
<th>Dog</th>
<th>Total No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclopia</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Dermoid</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Unilateral strabismus</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Bilateral convergent strabismus</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Unilateral anophthalmia and microphthalmia</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>8</td>
</tr>
</tbody>
</table>

Punctured wounds affecting the lower eyelids were associated with orbital cellulitis and were reported only in 2 cows (Fig.11-B). The latter wounds were healed after 2 weeks from injury with the formation of minimal scar on the palpebral conjunctiva without effect on eyelid margin. In the other ten cases, the lacerations involved the full thickness of the eyelids (Fig.10 & 11-A). Eight cases were recent and the other two cases were old (after about 30 hours from injury). Suturing was performed in both the recent and old cases (after trimming of the pedicle). Satisfactory healing was obtained in all ten cases without complications.

A mature subcutaneous abscess affecting the left upper eyelid in a buffalo calf (40 days old) was diagnosed (Fig.12). Drainage through a skin incision was performed and the cavity was touched with povidone iodine daily. Teramycin ophthalmic ointment was applied in the eye three times daily. The cavity was filled with healthy granulation tissue within 15 days without effect on eyelid margin.

Blepharitis was recorded in a sheep affecting the upper eyelid. It was acute, unilateral, traumatic and associated with hyperemia and swelling of the upper eyelid which obliterate the palpebral fissure completely (Fig.13-A). Systemic corticosteroids and antibiotic in addition to cold fomentations are sufficient for relieving the signs within 5 days.

Protrusion of the nictitating membrane and cherry eye with bilateral prolapse and protrusion of the third eyelid was recorded in one mixed breed cow (Fig.13-B), with no effect on animal health. Also nictitans gland prolapse (cherry eye) was diagnosed in 2 months old Great Dane dog.
Ophthalmic examination revealed a serous discharge and severe redness of the nictitans conjunctiva in both eyes. Pocket inversion technique was sufficient for treatment of this case without recurrence.

 Conjunctivitis, subconjunctival abscess and nodular conjunctival lesion secondary to lumpy skin disease were the conjunctival affections recorded by this study. Conjunctivitis was recorded in 37 animals (17 buffaloes, 14 cows, 3 horses & 3 sheep).

 There were two types, catarrhal (29 animals) and parenchymatous (8 animals). The clinical symptoms of catarrhal conjunctivitis were photophobia, plepharospasm, profuse lacrimation which was watery in early stages and by time it became mucopurulent. Mucous membrane was congested, swollen and reddish in color (Fig.14-A).

 Parenchymatous conjunctivitis characterized by chemosis (extensive edematous condition of the conjunctiva especially the bulbar one) was recorded in 7 buffaloes and a cow. The swollen palpebral conjunctiva was protruded out from the palpebral fissure while the bulbar one was extended over the cornea covering the limbus (Fig.15). All the recorded buffalo cases were unilateral and signs were restricted only to the eye. In the cow (bilateral case), urticaria, facial swelling and other mucocutaneous swellings were occurred. All cases of parenchymatous conjunctivitis were responded to systemic injection of non steroidal anti-inflammatory (flunixin meglumine) and antihistaminic drugs. Warm compresses were helpful for relieving conjunctival swelling.

 Ophthalmic examination of native breed cow revealed presence of a nodule at the palpebral conjunctiva of the upper eyelid as a complication to lumpy skin disease (Fig.16). The nodule was removed and the defect was flushed with normal saline and Terrexine was applied three times daily until healing within 12 days.

 The cornea was affected with keratitis, foreign bodies and perforating corneal wounds. Keratitis was encountered in 14 cases (7 cows, 4 buffaloes & 3 sheep). All cases were unilateral except a bilateral case in a cow (Fig.19). Profuse lacrimation, photophobia and plepharospasm were the common signs, in addition to opacity of the cornea which is the main characteristic sign (Figs.14-B &19). The discharges were mucoid, mucopurulent or purulent in late stages. One sheep was suffered from corneal ulceration in addition to corneal opacity, ulcerative keratitis. (Fig.20-A). Infectious bovine keratoconjunctivitis was reported in 21 calves on the basis of clinical examination. In addition to keratitis, there were edema and inflammation of the conjunctiva.

 A white spot near the center of the cornea was appeared in most cas-
es, then enlarged and elevated leaving a shallow ulcer.

A well defined corneal ulcer was formed after few days and it was associated with corneal opacity and vascularization. Fifteen animals were responded well to treatment, 3 calves needed redosing after a week and permanent corneal opacity was recorded in the other 2 animals. Corneal ulceration following old case of keratoconjunctivitis was occurred in a calf (Holstein breed, 50 days old). This was followed by iris prolapse and necrosis of the prolapsed iris. Treatment of this condition was performed and phthisis bulbi was the end result.

Foreign body in the cornea (particle of chaff) was recorded in a mixed breed cow and a buffalo. There were signs of keratitis in addition to presence of foreign body (Fig.21-A). The latter was removed (Fig.21-B), where the eye was flushed with warm normal saline and the foreign body was swabbed with a tampon moistened with normal saline. The corneal inflammation was subsided within a week in both cases.

Perforating corneal wounds were diagnosed in 5 cases (one cow, 2 buffaloes, one sheep & a horse). All cases were unilateral and they were recent and had a history of trauma.

They were accompanied with bleeding while orbital cellulitis was also present in a horse. The perforating corneal wound leads to evacuation of ocular contents followed by secondary infection in a buffalo. The end result of the latter case was panophthalmitis which necessitated enucleation of eyeball. Normal size of eyeball was obtained in case of horse accompanied with corneal scaring (Fig.22), while in the other cases; phthisis bulbi was the end result (Fig.23).

Two cases of unilateral hyphema were affecting 2 male Holstein cattle (13&17 months old). Each case had a history of trauma. Photophobia, profuse lacrimation with mucoid discharge were observed. The cornea was transparent and it reflected reddish coloration of the collected blood in the anterior chamber (Fig.24). The hemorrhagic blood has been disappeared completely following treatment by 2 weeks.

A case of hypopyon was diagnosed in the left eye of a ram. There was whitish discoloration of the cornea with accumulation of exudate in the anterior chamber (Fig.20-B).

Aspiration of the exudate in addition to injection of broad spectrum antibiotic helped in minimal subsiding of inflammation.

A unilateral case of acquired buphthalmos, as a complication of infectious bovine keratoconjunctivitis was reported in a mixed breed calf (6 months old).
There was bulging of the eyeball due to excessive fluid in the anterior chamber (Fig.25). Enucleation of that eye was resulted in rapid improvement in appetite and production.

Traumatic ocular proptosis was reported in 2 dogs (Boxer & Grivon) and a buffalo. In dogs, the cause was bite after fight with large sized animal, while in the buffalo, it was due to a severe trauma against hard object. The globe was protruded anterior to the orbit causing entrapment of the lid margins behind the anterior half of the globe (Figs.26,27 &28). This was associated with damage of extraocular muscles and was exaggerated by delayed inspection by the owners (after 2 days). Enucleation of the eyeball was curative for relieving pain and controlling the condition (Fig.26-C).

### Table (2): Illustrated classification of cases of different acquired ocular affections.

<table>
<thead>
<tr>
<th>Type of acquired affection</th>
<th>cattle</th>
<th>buffalo</th>
<th>equine</th>
<th>sheep</th>
<th>goat</th>
<th>dog</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacerations of the eyelid</td>
<td>4</td>
<td>-</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>11.11%</td>
</tr>
<tr>
<td>Punctured wounds of the eyelid</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1.84%</td>
</tr>
<tr>
<td>Blepharitis</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Subcutaneous abscess at the upper eyelid</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Subconjunctival abscess of the lower eyelid</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Bilateral prolapse of the third eyelid</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Nictitans gland prolapse(cherry eye)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>14</td>
<td>17</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>37</td>
<td>34.26%</td>
</tr>
<tr>
<td>Nodular conjunctival lesion after Lumpy Skin Disease</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Keratitis</td>
<td>7</td>
<td>4</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>14</td>
<td>12.96%</td>
</tr>
<tr>
<td>Infectious Bovine Keratoconjunctivitis</td>
<td>21</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>21</td>
<td>19.44%</td>
</tr>
<tr>
<td>Foreign body on the cornea</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1.84%</td>
</tr>
<tr>
<td>Perforating corneal wound</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>3.70%</td>
</tr>
<tr>
<td>Panophthalmitis</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Ruptured sclera</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Hyphema</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1.84%</td>
</tr>
<tr>
<td>Hypopyon</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Cataract</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Acquired buphthalmos</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.93%</td>
</tr>
<tr>
<td>Ocular proptosis</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2.78%</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>26</td>
<td>13</td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>
Fig.1: showing unhealthy necrotic iris following perforating corneal ulcer (A), after its excision (B). The corneal wound was sutured by 5/0 silk (C) and the wound was supported by application of third eyelid flap (D).

Fig.2: Showing bilateral prolapse of the nictitans gland in 2 months old Great Dane dog (A), after application of pocket inversion technique (B & C).

Fig.3: Showing cyclopia in one day old kid. There was a centrally located eye within an orbit and it was associated with prognathia (arrows).
Fig. 4: Showing congenital dermoid in a Holstein calf. The mass was covered with long hairs and it involved the medial canthus, third eyelid and lower eyelid (A&B).

Fig. 5: Showing 4 dermoids in a native breed calf (A&B arrows), and after surgical excision (C&D).

Fig. 6: Showing the same case in (Fig.5) after removal of the 4 Masses (A) and after 4 months p.o. (C). Microscopically, there is unilocular cyst within the dermis and it was lined by stratified squamous epithelium and containing eosinophilic keratinous mass in its lumen (B).

Fig. 7: Showing unilateral convergent strabismus in 2 mixed breed calves. The eyeballs were directed inward and medially (arrows).
Fig. 8: Showing bilateral convergent strabismus with exophthalmos (BCSE) in 2 Holstein cows (A&B).

Fig. 9: Showing unilateral anophthalmia (left eye, A&C) and unilateral microphthalmia (right eye, A&B) in a native breed calf.

Fig. 10: Showing eyelid lacerations in a foal and a donkey foal (A&C), and after reconstruction (B&D).

Fig. 11: Showing lacerated upper eyelid wound in a cow (A) and perforating lower eyelid wound in another cow (B).
Fig. 12: Showing ripened upper eyelid abscess in a buffalo calf (A) and after incision and evacuation (B & C).

Fig. 13: Showing blepharitis at the upper eyelid in a sheep (A, arrow) and bilateral protrusion of the third eyelid in a mixed breed cow (B, arrows).

Fig. 14: Showing congested conjunctiva and mucopurulent discharges in a buffalo suffered from catarrhal conjunctivitis (A) and superficial keratitis in another buffalo (B).

Fig. 15: Showing different forms of parenchymatous conjunctivitis in buffaloes (A, B & C).
Fig.16: Showing nodular lesion at the palpebral conjunctiva of the upper eyelid in a cow as a complication to lumpy skin disease (A), and after its removal (B).

Fig.17: Showing subconjunctival abscess obliterating most of the left palpebral fissure in a native breed calf (A), after surgical excision (B) and suturing (C).

Fig.18: Showing the removed mass (A) in Fig.17 and healing of the wound without complications, two weeks p.o. (C, arrow). Microscopically, line of defense, mainly neutrophils besides lymphocytes and plasma cells, was appeared (B).
Fig. 19: Showing different forms of keratitis in cattle.

Fig. 20: Showing ulcerative keratitis in a sheep (A) and hypopyon in a ram (B).

Fig. 21: Showing foreign body in the cornea (A) in a mixed breed calf and after its removal (B).

Fig. 22: Showing perforating corneal wound in a horse associated with orbital cellulitis (A), and corneal scaring was formed after healing (B).

Fig. 23: Showing perforating corneal wound in a buffalo (A), and phthisis bulbi was the end result (B).
Fig. 24: Showing two cases of unilateral hyphema in 2 Holstein calves. The cornea was transparent and it reflected reddish coloration of the collected blood in the anterior chamber (A&B).

Fig. 25: Showing acquired buphthalmos in a mixed breed calf (A) and after enucleation of the eyeball (B).

Fig. 26: Showing ocular proptosis in a Boxer dog, 2 days after fight (A&B) and after enucleation of the eyeball (C).

Fig. 27: Showing traumatic ocular proptosis in a Grivon dog (A&B).
Fig. 28: Showing ocular proptosis in a buffalo after 48 hours from severe trauma.
Fig. 29: showing cataract in a donkey.

DISCUSSION

The congenital ophthalmic affections reported in this study were cyclopia, ocular dermoid, unilateral strabismus, bilateral convergent strabismus with exophthalmos (BCSE) and a case of unilateral anophthalmia and microphthalmia. Cyclopia was diagnosed in a kid goat while other cases were present in cattle calves. Cyclopia is a single centrally located eye or a single orbit with one or two fused eyeballs located in the median face (Minoru and Katsumi, 1999, and Schulze and Distl, 2006). In the recorded case (kid), a centrally located eye was present within an orbit and it was associated with prognathia. A similar case was reported in a buffalo calf by Karrouf et al (2007). Also atypical cyclopia in a brown Swiss cross calf was reported, where the most significant malformation was the presence of a median orbital-like opening that did not contain an eyeball (Ozcan et al., 2006).

Ocular dermoids were recorded in two cases. They appeared as hairy dermal tissue with fine or coarse hair on the conjunctiva, medial canthus and upper eyelid. Similar findings were reported by Ismail (1987); Youseef et al., (1993) and Misk et al., (2005). Surgical excision of these skin-like patches was curative and signs of conjunctivitis were disappeared.

Strabismus in cattle can be caused by congenital defects, space-occupying processes within the orbit, neurologi-
cal diseases, muscular impairment, metabolic diseases or intoxication (Magnusson et al., 1983). Two mixed breed calves were affected with unilateral convergent, (esotopia) squint.

While two Holstein cattle were affected with BCSE. The eyeballs were rotated inward and medially, and this was associated with exophthalmos. The bovine eye is oval in shape and so the transverse diameter of which is greater than its axial diameter, so the eyeball protrudes when it is rotated (Power, 1987).

Anophthalmia is defined as a total absence of ocular tissue (Wilcock, 1993) while Moritomo et al., (1995) reported that calves lacked eyeball had small sized eyelids and narrow palpebral fissures are classified as anophthalmia, although a small cystic solid remnant of eyeball was buried in the mixture of vestigial extraocular muscles, lacrimal gland and adipose tissue of the orbit. Similar findings were recorded by this study in a native breed calf had unilateral anophthalmia. In the same animal, the other eye was suffered from reduced dimensions of the eye, prolapse of the third eyelid (unilateral microphthalmia).

Traumatic damage to the eyelids was reported in 4 cows and 7 horses (4 foals, 2 donkey-foals & a horse). The high incidence in foals in comparison to adult horses may be due to foals have a less euthetic withdrawal (menace) reflex than adult horses (Knottenbelt and Pascoe, 1994). Old eyelid lacerations were healed after trimming and suturing nearly as well as recent ones. Since the eyelids are highly vascular, so it is not necessary to remove loose tags of tissue, particularly if they include any portion of the eyelid margin. This was supported by Gellat and Wolf (1988). Lacerations of the eyelids should be repaired promptly to prevent lid deformities, infections and exposure-induced damage to the cornea (Lassaline, 2003). Complete avulsed eyelid can be successfully repaired simply by suturing it back into proper position directly after injury (Misk et al., 2005).

Both types of eyelid abscesses (subcutaneous and subconjunctival) were reported by this study. Encapsulated lower eyelid abscess was managed by surgical excision which resulted in satisfactory healing without complications. Evacuation of pus through a conjunctival incision was indicated by Misk et al., (2005). This may lead to entrance of bacteria to ocular structures and so different complications may occur.

Owing to the importance of nictitans gland in tear production, it is important to save the gland instead of removing it (Chahory et al., 2004). Excision of the nictitans should only occur if the damage to this structure is severe or if it is affected by a neo-
Different surgical repositioning techniques have been described in dogs for treatment of cherry eye (Gross, 1983 and Moore, 1983). Pocket inversion technique for repositioning of nictitans gland in the operated Great Dane is a useful surgical technique as described by Morgan et al., (1993) and Crispin, (2005).

Bilateral protrusion of the nictitating membrane was reported in a mixed breed cow. This case was not associated with other clinical symptoms and there was no effect on the animals' health, so excision of the membrane was not indicated. Prolapse of the nictitating membrane may be due to congenital microphthalmia and enophthalmia, encephalitis (due to rabies or tetanus), postorbital space occupying lesion; such as (abscesses, cysts, tumors and hematomas) and contraction of the retractor oculi muscle (Jennings, 1984; Slatter, 1993 and Misk et al., 2005).

Ocular proptosis occurs much more frequently in brachycephalic dogs, but in these breeds, less injury is required to cause proptosis (Morgan, 2007). Proptosis causes stretching or tearing of the extraocular muscles, the optic nerve, and all the vessels and nerves supplying the globe Cho (2008). The three cases (2 dogs and a buffalo) encountered in this study were approached after 2 days, so enucleation was indicated rather than repositioning. This was supported by Gilger et al., (1995) who reported that the prognosis for having a viable eye after surgical replacement of a proptosis is poor. Enucleation can provide a rapid resolution to chronic painful eye disease, at the same time eliminating the need for topical medication for the affected eye Cho (2008).

Phthisis bulbi (shrinking of the globe) was the end result in 3 cases (a cow, a buffalo & a sheep) of perforating corneal wounds and in a calf suffered from iris prolapse following severe pink eye. This may be due to evacuation of ocular contents following corneal perforation. Similar results were reported by (Rebhun et al., 1995). This did not occur in case of horse which might be due to the associated blepharitis and swelling of both the upper and lower eyelids which restricted or minimized the evacuation of ocular contents. Ruptured sclera was reported in a goat and the wound was located near the limbus and so it could be clinically visualized. Surgical repair of this wound was performed. The size of the globe was nearly normal but there was blindness. Enucleation is the only treatment option for extensive scleral rupture as blindness and phthisis bulbi are a common sequel after globe contusion Martin (2005) and Rampazzo et al., (2006).

A case of acquired buphthalmos was reported by this study as a complication to infectious bovine keratoconjunctivitis (IBKC). Acquired buphal-
mos usually occurs from intraocular inflammatory disease of exogenous or endogenous cause. IBKC can cause corneal perforation, iris prolapse, anterior synechia and eventually glaucoma, which may result in buphthalmos (Chawla et al., 1996).

Recent cases of infectious bovine keratoconjunctivitis (IBK) were responded well to treatment by subconjunctival injection of 100 mg of oxytetracycline (OTC) dihydrate. Both methods of intrapalpebral (200 mg OTC-Hcl) and systemic injections (20 mg/Kg B.W. im, of long acting OTC-dihydrate) were found to be similarly effective for treatment of IBK in calves Strake et al., (2007).

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**الملخص العربي**

المعاملة الجراحية لبعض إصابات العيون في الحيوانات المستأنسة

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أجريت هذه الدراسة من أجل إلقاء الضوء على أهم إصابات العيون النادرة والشائعة في الحيوانات المختلفة بمحافظة الدقهلية مع تسجيل هذه الأنواع وتوضيحها مع توضيح الأنواع منها القابلة للمعالجة جراحيا.

وعلي هذا فقد تم تشخيص 116 حالة من إصابات العيون المورثة والمكتسبة التي تم فحصها بمختلف الأماكن في محافظة الدقهلية وذلك من خلال القوافل البيطرية التعليمية أو في بعض المزارع الخاصة بالمحافظة بجانب الحيوانات التي وردت الي قسم الجراحة بالمستشفى البيطري التعليمي لكلية الطب البيطري -جامعة المنصورة.

تم توصيف ثمانية حالات مورثة اشتملت على حالة إتصال العينين في جدي ،حالتين من الحويصلات الجلدية (درمويد) ، 4 حالات حول (2 أحادية الجانب و 2 مزدوجة الجانب) مصحوبة بجروح العين المصابة ، وأخيرا سجلت حالة غياب مقلة عين وصغر العين الأخرى في عجل بقري.
وكانت أمراض العيون المكتسبة كالتالي: 37 إلتهاب ملتحمة العين، 21 التهاب القرنية والملتحمة بالأبقار، 14 التهاب الملتحمة، 12 تهتكات بجفون العين، 4 جروح القرنية النافذة، 3 حروف العين، 20 نزف في غرفة العين الأمامية، 20 أجسام غريبة في القرنية، 2 جروح وخزية في جفن العين، وحالة واحدة في كل من الإصابات التالية: قطع الصليبة العينية، تقحغ الغرفة الأمامية للعين، الماء الأزرق، التهاب العين الصدري، الإصابة العقدية لملتحمة العين نتيجة مرض التهاب الجلد العقدي، استسقاء المقلة، انقلاب غدة الجفن العلوي، الخراج تحت الملتحمة للجفن السفلي، الخراج تحت الجلد للجفن العلوي، الانقلاب ذو الجانبين للجفن الرامش والتهاب الجفون.