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ACKNOWLEDGEMENT

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(Pradeep Kumar)

INTRODUCTION
The camel is among the animals mentioned in the Qur’an as the miracle of God (Deurasech, 2005). The family camelidae is divided into two genera. The genus camelus includes two species: *Camelus dromedarius*, one-humped or Arabian camel, and the *Camelus bactrianus*, two-humped camel. The second genus is the *Llama* comprising four species (Mason, 1979; Simpson, 1945). The new system of classification proposed is based on the fact that the camel is a major component of the agro-pastoral systems in vast pastoral areas in Asia and Africa. Camels may be classified into four major classes: Meat, Dairy, Dual Purpose and Race camels (Wardeh, 2004).

The camel is an important livestock species uniquely adapted to hot and arid environment. It produces milk, meat, wool, hair and serves for riding, as beast burden and as a draft animal for agriculture and short distance transport. In fact camel is the most suitable domestic mammal for use in climatic adversities that has versatility in its utility, so much so that besides having outstanding transport capability as a pack or riding animals, its milk, meat, wool, skin, bones, urine and dung are also useful. Indian scientists now also support the therapeutic value of camel milk in the treatment of several diseases including tuberculosis. A recent study suggested that camel milk is useful for treatment of type first diabetes (Agarwal *et al.*, 2003). It is common practice to let the camel to eat certain plants in order to use the milk for medicinal purpose (Yagil, 1986).

The camel population in world is 19.31 million. Africa having the highest camel population of 15.13 million and in Asia it is 4.17 million. Overall population of camel in India is 0.632 million and it ranked sixth in the world after Somalia (7.0 m), Sudan (3.2 m), Mauritania (1.29 m), Ethiopia (1.107 m) and Pakistan (0.800 m) (FAO, 2006, cited by Gahlot, 2007 a). In india most of camel population is confined to the north western part of the country and almost the entire camel population is *Camelus dromedarius* and
very small population is *Camelus bactrianus* type which is found in Laddakh area of Jammu and Kashmir (Khanna and Khan, 1988). The camel population of Rajasthan in census 1992, 1997 and 2003 were 749,000, 657,000 and 498,000 units respectively, which are decreasing gradually but is highest in India (FAO, 2003). By 1997, the overall camel population of India has slashed down to 11.6 per cent, according to official data of the government and it had been surpassed by Pakistan and Mauritania. The number of young camels even decrease by 50 per cent during this period. According to the livestock census 2003, Rajasthan camel population has now dropped below half a million (0.498) which is 24 per cent decline since 1997. According to 18th livestock census 2007, it was recorded as 430426 units which decrease 13.57% from 17th livestock census (Rajasthan State Livestock Development Policy, 2009). Poor nutritional status, genetic makeup, disease, environmental stress etc are some of the factor responsible for declining camel population.

Camel plays an important role in the socio-economic structure of the rural masses. Some very poor and marginal communities of Rajasthan depend on the camel as basis of their livelihood. Around 10,000 families from the Raika caste of Rajasthan, who own herds of female camels, make a living from selling the young animals. Entire villages in Thar Desert depend on camel to lift water from deep wells. Many villagers receive income from the processing of camel products. Although poorly documented, these secondary industries include leather and bone work. The population of Rajasthan as whole benefits from the camel as an eco-friendly source of energy and reducing the need for imparting petrol products.

Camel, one of the oldest mammals among the living is essentially a domesticated animal of arid zone. Its indispensable use in desert has designated this animal as ship of the desert. Remarkable morphological and physiological adaptation has made this
animal an integral part of rural life particularly in agricultural sector. On farm, as a beast of burden, camels can be indispensable at harvest time. A camel can carry a load of up to 300 kilos over long distances and more than 450 kilos over short distances. Other chores performed by camels include threshing, lifting water for irrigation and powering oil mills. The camels are also used as a riding animal. The Indian Border Security Force keeps more than 1500 camels to patrol the border with Pakistan. Mostly camel herds are kept by pastoralists in subsistence production systems. They are also very reliable milk producers during dry seasons and drought years when milk from cattle, sheep and goats is scarce. In recent years the picture of “moving” nomads has changed to great extent owing to growing urbanisation. In India, camel is an important means for transportation and for domestic use as drawing water from wells, rivers and dams (Gahlot, 2007).

Camel's natural grazing pattern has proved to be very beneficial for environment. No single area is intensively grazed and sufficient foliage is left for regrowth of vegetation. The camel's springy padded feet do not cut or break grasses as do the sharp hooves of the other herbivores.

Camel suffers with various surgical affection of head and neck region such as mandible fracture, soft palate injury, torticollis, lacerated eyelid, ruptured eyeball, corneal opacity and lacerated nostril because camel browsing the upper storey tree vegetation and the thorny vegetation from shrubs and bushes, which often inflict injuries to the head region mostly eyes and lips are involve. Besides eye injuries plant milk, plant juices, pollen grains, leaves etc., also cause irritation to the eye resulting in conjunctivitis, keratitis, blepharitis, epiphora, corneal ulceration and oedema of the eyelids. The male camels in ‘rut’ season become vicious and unmanageable, during vicious condition male camels bite himself and fighting with another camels which cause head injuries such
as mandible fracture, soft palate injuries and laceration of nostrils may occur and in order to restrain such animal the owner bashes with a stick over the head and neck which sometimes cause injuries of head and neck region mostly affects the eye.

A need was felt for a systemic study of the occurrence, incidence, etiology, symptoms, diagnosis and treatment of surgical affections of head and neck region of camel. Hence the present project is planned to carry out clinical study on surgical affection of head and neck region of camels which markedly affect the value of the animal, draft capability and overall performance. The present study will also help the field veterinarians for a better comprehension of diagnosis and treatment of various surgical affections of head and neck region while endeavoring for a better health care of camels specially when its population is on a declining phase.

The proposed clinical study on head and neck region of camel was undertaken with the following objectives-

a. To diagnose various surgical affections of head and neck region on the basis of the history and clinical examination

b. To record the incidence/occurrence and classify the surgical affections head and neck region in camels.

c. To carry out appropriate surgical or surgico therapeutic or therapeutic treatment of these affections in camels.

d. To carry out a retrospective study of surgical affections of head and neck region of last ten years (2001-2010) in camels.

e. To analyse the clinical cases treated/recorded in camels in the present study.
MATERIALS AND METHODS
The animals of present study were divided in two groups, i.e. Group A and B. The animals of Group A consisted of clinical cases presented to surgery clinics, College of Veterinary and Animal Science, Bikaner from April 2011 to December 2012. Animals of Group B included ten years retrospective study of surgical affections of head and neck region, which were recorded from outdoor register from the year 2001 to 2010.

All the cases in Group A were recorded in term of age, sex and type of surgical affections of head and neck region. Appropriate treatment was given for particular surgical affection. A record sheet was prepared for recording the cases in clinics (Appendix I). The detailed information of the cases was analysed with the help of software developed in department.

The study was conducted as follows:
1. Diagnosis.
2. Incidence/occurrence of the affections.
3. Treatment.
4. Retrospective study for last ten years (2001-2010).
5. Analysis of result

1. Diagnosis:

Surgical affections of head and neck region recorded in present study were diagnosed on the basis of history, clinical examination and radiologically examination whenever required. The nature of affection was evaluated on the basis of its clinical
signs such as swelling (Abscess, tumour etc.), inflammation, suppuration, necrosis etc. Exploratory puncture was done as and where required in cases of swelling. Chronicity of ailment was determined by history and previous treatment given.

2. Incidence/occurrence:

The clinical cases were classified according to age, sex, region, season, year and incidence/occurrence of these cases was recorded.

3. Treatments:

The diverse surgical affections of head and neck region recorded in the present study were treated on the general principle of management of these affections as described by Gahlot and Chouhan (1992), Ramadan (1994a) and Gahlot (2000). Surgical dissection, excision, debridement and/or other appropriate surgical procedures were used to treat these cases. The diverse affections of head and neck region in camels were treated while employing appropriate regional or local anaesthesia and sedation. Xylazine hydrochloride was used for sedation @ 0.3 mg/kg body weight I/V (Sharma et al, 1985). 2% lignocaine hydrochloride was used to achieve local infiltration anaesthesia, regional nerve block or field block etc.

Drugs used in the present study
The following broad spectrum antibiotics, topical broad spectrum antibiotics or eye drops, nonsteroidal anti-inflammatory drugs, steroidal anti-inflammatory drugs, feed supplements, topical ointment or powder, spray were used for treatments given in animals of present study.

**a) Broad spectrum antibiotics:**

i. Oxytetracycline 50 mg/ml (Terramycin\(^1\)).

\(^1\)Terramycin: Pfizer Pharmaceutical Ltd.

ii. Ampicillin sodium 2g and Cloxacillin sodium 2g/vial (AC-Vet Max\(^2\)).

iii. Streptopenicillin: Containing Procaine penicillin V 15 lac, Benzyl penicillin 5 lac, Streptomycin sulphate 2.5 g/vial (Bistrepen-V\(^3\)).

**b) Topical broad spectrum antibiotics or eye drops:**

i. Gentamicin sulphate 0.3% w/v (Genticin\(^4\))

ii. Chloramphenicol 5% (Chloromycetin\(^5\))

**c) Nonsteroid ant-inflammatory drugs:**

i. Meloxicam 5 mg/ml (Melonex\(^6\)).

ii. Phenylbutazone 200mg/ml, Sodium Salicylate 20mg/ml (Artizone-S\(^7\)).
d) Steroid anti-inflammatory drug:

Triamcinolone Acetate 6 mg/ml (Vetalog\textsuperscript{8}).

e) Feed supplement:

Vitamin A 7,00,000 IU, Vitamin D\textsubscript{3} 70,000 IU, Vitamin E 250mg, Nicotinamide 1 g, Copper 1200 mg, Magnesium 6 g, Iron 1.5 g, Zinc 9.6 g, Iodine 325 mg, Selenium 10 mg, Manganese 1.5 g, Calcium 25.5%, Phosphorus 12.75%, Sulphur 0.72%, Sodium 5.9 mg and Potassium 100 mg (Powder Chelated Agrimin Forte\textsuperscript{9}).

\textsuperscript{2}AC-Vet Max : Intas Pharmaceutical Ltd.
\textsuperscript{3}Bistrepen-V: Alembic Pharmaceutical Ltd
\textsuperscript{4}Genticin : Inter Health Ltd.
\textsuperscript{5}Chloromycetin : Pfizer Pharmaceutical Ltd.
\textsuperscript{6}Melonex : Intas Pharmaceutical Ltd.
\textsuperscript{7}Artizone-S: Pfizer Pharmaceutical Ltd.
\textsuperscript{8}Vetalog : Zydus Animal Health Ltd.
\textsuperscript{9}Powder Chelated Agrimin Forte : Virbac Animal Health India Pvt. Ltd.

f) Topical spray/ointment:

i. Spray: \textit{Pinus longifolia} 1.5 g, \textit{Eucalyptus} spp. 1.25 g, \textit{Cedrus deodara} 1.0 g, Excipients q.s. (Topicure\textsuperscript{10}).

ii. Ointment: Gamma benzene hexa chloride and proflavine hemisulphate with cetrimide (Lorexane\textsuperscript{11})

iii. Ointment: Gentamicin sulphate 0.1% w/w, Gentamicin base (1000 units/g), water miscible base q.s. (Lyramycin\textsuperscript{12}).
iv. Ointment: Devdaru tail, Karanja tail and absorption base (Charmil\textsuperscript{13}).

g) Topical antiseptic:

i. Povidone iodine 5% w/v (Povidin\textsuperscript{14}).

ii. Tincture of iodine 2.5% w/v

iii. Potassium Permanganate solution 5% w/v

4. Retrospective study for last ten years (2001-2010)

   All the cases in Group B were recorded in term of seasons, years, months, sex and type of surgical affections of head and neck region and the treatment given.

5. Analysis of results

   Analysis of various clinical cases treated in present study and retrospectively recorded cases was carried out. The efficacy of these treatments was assessed in terms of healing of wounds.

\textsuperscript{10} Topicure : Natural Remedies Pvt. Ltd.
\textsuperscript{11} Lorexane : Virbac Animal Health India Pvt. Ltd.
\textsuperscript{12} Lyramycin : Lyka Labs Ltd.
\textsuperscript{13} Charmil : Ayurvet limited.
\textsuperscript{14} Povidin : Jeps Pharma Pvt. Ltd.
Fig. 1: Photograph showing mandible fracture with downward inclination of fractured fragment in a camel.

Fig. 2: Radiograph (Lateral View) showing the site of mandible fracture in a camel (arrow).

Fig. 3: Photograph showing Interdental wiring (IDW) technique for repair of mandible fracture in a camel (arrows).
Fig. 4: Radiograph (Lateral View) showing repaired mandible fracture by Interdental wiring (IDW) technique in a camel.

Fig. 5: Photograph showing protruded soft palate hanging outside the mouth in a camel.
Fig. 6: Hanging soft palate grasped with towel and pulled out for surgical resection in camel.

Fig. 7: Soft palate resection close to its attachment with long handle (metzenbaum) scissors in a camel (arrows).
Fig. 8: Photograph showing irrigation of oral cavity after soft palate resection in a camel.

Fig. 9: Photograph showing buccal fistula and masticated feed coming out through the opening in camel (arrow).
Fig. 10: Photograph showing repair of buccal fistula using two circular rubber pieces in a camel.

Fig. 11: Photograph showing salivary fistula (arrow) in a camel.

Fig. 12: Photograph showing ligation of salivary duct in a camel.
Fig. 13: Photograph showing severe gingivitis in a camel (arrow).

Fig. 14: Photograph showing mild corneal opacity in left eye in a camel (arrow).

Fig. 15: Photograph showing severe corneal opacity in left eye in a camel.
Fig. 16: Photograph showing a reddish ulcerative area near center of cornea in a camel.

Fig. 17: Photograph showing healing of ulcerative area of cornea in a camel.
Fig. 18: Photograph showing laceration of cornea in full thickness along with protrusion of iris (arrow) in a camel.

Fig. 19: Photograph showing repair of lacerated cornea using absorbable suture materials in a camel.
Fig. 20: Photograph showing temporary tarsorrhaphy after repairing of lacerated cornea in a camel (arrow).

Fig. 21: Photograph showing conjunctivitis in a camel.
Fig. 22: A case of kerato-conjunctivitis with severe corneal opacity in a camel.

Fig. 23: Photograph showing lower eyelid laceration in a camel (arrow).

Fig. 24: Photograph showing repaired lacerated eyelid in a camel.
Fig. 25: Photograph showing unilateral laceration of nostrils (arrow) in a camel.

Fig. 26: Photograph showing healed wound of lacerated nostrils after removal of sutures in a camel (arrow).

Fig. 27: Photograph showing bilateral laceration of nostrils (arrows) in a camel.
Fig. 28: Photograph showing repaired bilateral lacerated nostrils using Vertical mattress sutures in a camel (arrows).

Fig. 29: Photograph showing tennis ball size tumor on left cheek in a camel.
Fig. 30: Photograph showing sutured cheek skin after surgical removal of tumor in a camel.

Fig. 31: Micro photograph showing fibroma at cheek region in a camel.
Fig. 32: Photograph showing tumour in oral cavity in a camel (arrows).

Fig. 33: Photograph showing the site after removal of tumor in a camel.

Fig. 34: Micro photograph showing fibroma in oral cavity in a camel.
Fig. 35: Photograph showing large haemorrhagic wound above nose with a loss of skin in camel.

Fig. 36: Photograph showing wound at head region in a camel (arrows).

Fig. 37: Photograph of torticollis showing S-shaped curvature of neck in a camel calf.
Fig. 38: Photograph showing supportive bandage with splint to correct curvature in torticollis in a camel calf.

Fig. 39: Photograph showing dermoid cysts on proximal part of the neck region in vicinity of jugular vein in a camel (arrow).
Fig. 40: Tumour at proximal aspect of neck close to the angle of mandible (arrows) in a camel.

Fig. 41: Photograph showing surgical excision of tumour in a camel.

Fig. 42: Photograph showing haemostasis achieved by red hot firing rod after surgically removal of tumour at neck region.

Fig. 43: Photograph showing abrasion wounds (arrows) on ventral aspect of neck region in a camel.
Fig. 44: Photograph of chronic abscess on ventral aspect of the base of neck region in a camel.
The animals of the present study were divided into two groups, A and B. Group A consisted of clinical cases presented to surgery clinics, from April 2011 to December 2012. Animals of group B included a ten-year (2001 to 2010) retrospective study of surgical affections of the head and neck region.

All the cases in Group A were recorded in terms of sex, season, age, and type of surgical affections of the head and neck region. Appropriate treatment was given for each particular surgical affection. All the cases in Group B were recorded in terms of sex, season, years, and type of surgical affections of the head and neck region.

Surgical affections of the head and neck region, recorded in the present study, were diagnosed on the basis of history, clinical examination, and radiological examination wherever required. The nature of the lesion was evaluated on the basis of clinical signs such as swelling, inflammation, suppuration, necrosis, etc. Exploratory puncture was done as and where required in cases of swelling. Chronicity of lesion was determined by the history and previous treatment given.

In the present study, a total of 138 cases were recorded. Surgical affections of the head region included mandible fracture 43 (31.15%), lacerated nostril 10 (7.24%), corneal opacity 9 (6.52%), submandibular abscess 8 (5.79%), eyelid laceration 7 (5.07%), conjunctivitis 7 (5.07%), wound at nostrils 6 (4.34%), wound at head region 5 (3.62%), soft palate injury 5 (3.62%), salivary fistula 5 (3.62%), buccal fistula 3 (2.17%), gingivitis 3 (2.17%), corneal ulcer 3 (2.17%), keratitis 3 (2.17%), keratoconjunctivitis 2 (1.44%), corneal laceration 2 (1.44%), oral tumor 1 (0.72%), and cheek tumor 1 (0.72%). Surgical affections of the neck region included torticollis 2 (1.44%), dermoid cyst 4 (2.89%), tumor at neck 3 (2.17%), contusion and abrasion at neck 3 (2.17%) and abscess at neck region 3 (2.17%).
The overall occurrence of surgical affections of head region was found to be higher 123 (89.13%) than in neck region 15 (10.86%). The overall occurrence of diverse surgical affections recorded in male and female camels was 117 (84.78%) and 21 (15.21%), respectively. The overall occurrence of surgical affections found to be highest in winter 76 (55.07%) followed by summer 37 (26.81%) and rainy season 25 (18.11%) respectively. The overall occurrence of surgical affections was found to be highest in 6-9 years age group 67 (48.55%) followed by above 9 years age group 49 (35.50%), 3-6 years age group 16 (11.59%) and below 3 years age group 6 (4.34%) respectively.

The diverse surgical affections recorded in the present study were treated on the general principle of management. All animals showing diverse surgical affections were subjected to a variety of treatments which included debridement to surgical excision and suturing. The efficacy of these treatments was assessed in terms of healing of wounds.

In animals of present study the management of different wounds, abscesses and sinuses were done by debridement, providing effective drainage and irrigation with light potassium permanganate solution. The antiseptic used to be 5% povidone iodine and tincture of iodine. The topical gentamicin eye drops, chloramphenicol eye drops, ointment lorexane, lyramycin, charmil gel and topicure spray were found to be effective in a dressing of wounds.

Repair of mandible fracture with IDW technique and soft palate resection was done. Tumor at cheek, oral tumor, tumor at neck region and dermoid cysts were surgically excised. In cases of torticollis supportive cast was applied. Buccal fistula, salivary fistula, laceration of nostril, eyelids and lacerated cornea repaired successfully in camels.
In the majority of cases of the present study, the antibiotics given were oxytetracycline, streptopenicillin, combination of ampicillin and cloxacillin. The phenylbutazone and meloxicam were used as popular nonsteroidal antiinflammatory drugs to treat the cases. Topical gentamicin and chloramphenicol eye drops were instilled in ophthalmic affections. These drugs were found to be effective in controlling infection, reducing inflammation and releasing pain.

In retrospective study, the occurrence of affections was higher in head region 878 (96.48%) than in neck region 32 (3.51%). The occurrence of affections was found to be higher in male 799 (87.80%) and females 111 (12.19%). The overall occurrence of surgical affections was found to be highest in winter 472 (51.86%) followed by summer 259 (28.46%) and rainy season 179 (19.67%) respectively. The incidence of congenital affections (subconjunctival haemorrhage and Descemetocele) were 2 (0.21%) as compared to the acquired affections 794 (99.78%).

The results of the present investigation revealed that strict aseptic measure with gentle handling of the tissue and guarding against postoperative contamination and infection gives rise to an ideal healing. In addition, proper surgical interference and management of open granulating wounds with or without cavitation, cleansing, debridement including curetting and removal of sequestrum, providing adequate drainage. Through irrigation or flushing of wounds by the use of 5% potassium permanganate solution along with proper parental administration of antibiotics and gentle application of different preparation and rest gave faster healing.

**Conclusion**
1. The occurrence of mandible fracture was found to be maximum in present study 43 (31.15%) and in ten years retrospective study 213 (23.40%).

2. The occurrence of surgical affections was found to be higher in male camels in the present study (84.78%) and in a retrospective study (87.80%) as compared to females.

3. The occurrence of surgical affections of head region was found to be higher in the present study (89.13%) and in a retrospective study (96.48%) as compared to the neck region.

4. The occurrence of surgical affections was found to be highest in 6-9 year age group (48.55%) in the present study.

5. The overall occurrence of surgical affections was found to be highest in winter season in the present study (55.07%) and in a retrospective study (51.86%) as compared to summer and rainy season.

6. An overview of ten year's retrospective study revealed that there was a maximum occurrence of surgical affections 13.40% in the year 2001 which subsequently decreased to 7.58% in the year 2010.

7. Careful clinical judgement, early surgical management with gentle handling of tissue brings about quick and better recovery in naturally occurring clinical wounds in the camels.
A Clinical Study on Surgical Affections of Head and Neck Region of Camels (*Camelus dromedarius*)

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ABSTRACT

The animals of the present study were divided into two groups, A and B. Group A consisted of clinical cases presented to surgery clinics, from April 2011 to December 2012 and recorded in terms of region, sex, season and age. Animals of group B included ten years (2001 to 2010) retrospective study of surgical affections of head and neck region and recorded in terms of region, sex, season and year.

The occurrence of mandible fracture was found to be maximum in present study 43 (31.15%) out of 138 cases and in retrospective study 213 (23.40%) out of 910 cases recorded. The occurrence of surgical affections of head region was found to be higher in present study 123 (89.13%) and in retrospective study 878 (96.48%). The occurrence of surgical affections was found to be higher in male camels in present study 117 (84.78%) and in retrospective study 799 (87.80%). The occurrence of surgical affections was found to be highest in 6-9 year age group 67 (48.55%) in the present study. The overall occurrence of surgical
affections was to be highest in winter season in present study 76 (55.07%) and in retrospective study 472 (51.86%). An overview of ten year’s retrospective study revealed that there was a maximum occurrence of surgical affections 13.40% in the year 2001 which subsequently decreased to 7.58% in the year 2010.

In animals of the present study, the early clinical healing was observed in cases where planned surgery was done specially in mandible fracture, soft palate injury, buccal and salivary fistula, lacerated nostril and eyelids.

In the majority of cases of the present study, the antibiotics given were oxytetracycline, streptopenicillin, a combination of ampicillin and cloxacillin. The phenylbutazone and meloxicam were used as popular nonsteroidal antiinflammatory drugs to treat the cases. Topical gentamicin and chloramphenicol eye drops were instilled in ocular cases. These drugs were found to be effective in controlling infection, reducing inflammation and releasing pain.

Careful clinical judgement, early surgical management with gentle handling of tissue, aqua therapy or through wound irrigation, effective topical medication and sufficient rest brings about quick and better recovery in naturally occurring clinical wounds in the camels.
वर्तमान अध्ययन में पशुओं को दो समूहों में बांटा गया था 'ए' और 'बी'. समूह 'ए' में वो क्लीनिकल मामले शामिल किये गये जो अप्रेल 2011 से दिसंबर 2012 के बीच शल्य चिकित्सालय में प्रस्तुत किये गये एवं इन सभी मामलों को क्षेत्र, लिंग, मौसम एवं आयु के अनुसार दर्ज किया गया। समूह 'बी' में जानवरों के यह साल (2001-2010) के सिर एवं गर्दन क्षेत्र का पूर्ववापी अध्ययन किया गया एवं सभी मामलों को क्षेत्र, लिंग, मौसम एवं वर्ष के अनुसार दर्ज किया गया।

वर्तमान अध्ययन में कुल 138 में से 43 (31.15%) एवं पूर्ववापी अध्ययन में कुल 910 में से 213 (23.40%) अधिकतम घटनाएं निचल जबड़े का दर माप गया। शल्य विकारों की घटनाएं नए ऊँटों में, वर्तमान अध्ययन कुल 138 में से 117 (84.78%) एवं पूर्ववापी
अध्ययन कुल 910 में से 799 (87.80%) में उच्च पाई गई। शल्य विकारों की घटनाएं सिर क्षेत्र में, वर्तमान अध्ययन 123 (89.13%) एवं पूर्वव्यापी अध्ययन 778 (96.48%) में उच्च पाई गई। शल्य विकारों की घटनाएं वर्तमान अध्ययन में 6-9 वर्ष के आयु समूह 67 (48.55%) में सबसे ज्यादा पाई गई। शल्य विकारों की घटनाएं सर्दी के मौसम में वर्तमान अध्ययन 76 (55.07%) एवं पूर्वव्यापी अध्ययन 472 (51.86%) में ज्यादा पाई गई। दस सालों के पूर्व व्यापी अध्ययन से पता चला है कि शल्य विकारों की अधिकतम घटनाएं 2001 में 13.40% थी जो घटकर 2010 में 7.58% रह गई।

वर्तमान अध्ययन में वे मामले जल्दी ठीक हुए जहां पर योजनाबद्ध तरीके से शाल्य चिकित्सा की गई।

वर्तमान अध्ययन के अधिकांश मामलों में आक्सीट्रासाइकलिन, स्ट्रेप्टोपेनेसीलिन एवं एम्पीसीलिन तथा क्लोलसासीलिन का संयोजन एंटीबायोटिक के साथ दी गई। इसे इलाज के लिए नानस्टेसाइडल एंटीइनफ्लामेंटरी दवाओं फेनिलब्यूटाजोन एवं मेलोक्सिंकेम का इस्तेमाल किया गया। ये दवाएं संक्रमण को नियंत्रित करने, सूजन को कम करने एवं दर्द मिटाने में प्रभावी पाई गई।

सावधानी पूर्वक नैदानिक निर्णय, सावधानी पूर्वक उत्तर देने का ध्यान रखते हुए जल्दी शल्य प्रबंधन करना, तरलीय चिकित्सा या घाव सिंचाई के माध्यम से, प्रभावी सामान्यिक दवा एवं पर्याप्त दवा एवं पर्याप्त आराम से जल्दी और बेहतर तरीके से घायलों का निदान होता है।
Appendix I

College of Veterinary and Animal Science, Bikaner
Department of Veterinary Surgery and Radiology

Case Record sheet
Surgical affections of Head and Neck Region of Camels (Camelus dromedarius)

By Pradeep Kumar

1. Owner's Name and Address

2. Case No

3. Date

4. Age

5. Sex

6. Part Affected (diagnosis)
   I. Head Affection
   II. Neck Affection

7. Possible etiology (Based on History)

8. Line of Treatment

9. Follow up
A Clinical Study on Surgical Affections of Head and Neck Region of Camels (Camelus dromedarius)

10. Prognosis..............................
PRADEEP KUMAR
B.V.Sc. and A.H.

THESIS
Master of Veterinary Science
(Veterinary Surgery and Radiology)

2013
Department of Veterinary Surgery and Radiology
College of Veterinary and Animal Science
Rajasthan University of Veterinary and Animal Sciences, Bikaner-334001
A Clinical Study on Surgical Affections of Head and Neck Region of Camels (*Camelus dromedarius*)

ento के र एवं गर्दन क्षेत्र के शल्य विकारों का शायनिक अध्ययन

**THESIS**

Submitted to the
Rajasthan University of Veterinary and Animal Sciences, Bikaner
In partial fulfillment of the requirements for
the degree of

**Master of Veterinary Science**

(Veterinary Surgery and Radiology)

FACULTY OF VETERINARY & ANIMAL SCIENCE

By

Pradeep Kumar
B.V.Sc. and A.H.
Rajasthan University of Veterinary and Animal Sciences, Bikaner
College of Veterinary and Animal Science, Bikaner

CERTIFICATE-I

Date..........., 2013

This is to certify that Dr. Pradeep Kumar has successfully completed the comprehensive examination held on 20-09-2012 as required under the regulations for Master of Veterinary Science.

(Dr. T.K. Gahlot)
Head
Department of Veterinary Surgery and
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Bikaner
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College of Veterinary and Animal Science, Bikaner

CERTIFICATE-II

Date..........., 2013

This is to certify that this thesis entitled “A Clinical Study on Surgical Affections of Head and Neck Region of Camels (*Camelus dromedarius*)” submitted for the degree of Master of Veterinary Science in the subject of Veterinary Surgery and Radiology embodies bonafide research work carried out by Dr. Pradeep Kumar under my guidance and supervision and that no part of this thesis has been submitted for any other degree. The assistance and help received during the course of investigation have been fully acknowledged. The draft of the thesis was also approved by the advisory committee on..................

(Dr. T.K. Gahlot)  
Head  
Department of Veterinary Surgery and Radiology  
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(Dr. N.R. Purohit)  
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College of Veterinary and Animal Science, Bikaner
CERTIFICATE-III

Date..........., 2013

This is to certify that the thesis entitled "A Clinical Study on Surgical Affections of Head and Neck Region of Camels (Camelus dromedarius)" submitted by Dr. Pradeep Kumar to Rajasthan University of Veterinary and Animal Sciences, Bikaner, in partial fulfillment of requirements for the degree of Master of Veterinary Science in the subject of Veterinary Surgery and Radiology after recommendation by the external examiner was defended by the candidate before the following members of the examination committee. The performance of the candidate in the oral examination on his thesis has been found satisfactory; we therefore recommend that the thesis be approved.

(Dr. N.R. Purohit) (Major advisor)
(Dr. T.K. Gahlot) (Advisor)

(Dr. J.S. Mehta) (Advisor)
(Dr. Nalini Kataria) (Dean, PGS Nominee)

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College of Veterinary and Animal Science, Bikaner
CERTIFICATE – IV

This is to certify that Dr. Pradeep Kumar of the department of Veterinary Surgery and Radiology, College of Veterinary and Animal Science, Bikaner has made all corrections/modifications in the thesis Clinical Study on Surgical Affections of Head and Neck Region of Camels (*Camelus dromedarius*)” which were suggested by the external examiner and the advisory committee in the oral examination held on…………..The final copies of the thesis duly bound and corrected were submitted on……………. are enclosed herewith for approval.

Enclosed are one original and two copies of bound thesis. Forwarded to the Dean, Post Graduate Studies, RAJUVAS, Bikaner through the Dean, College of Veterinary and Animal Science, Bikaner.

Major Advisor

Enclosed are one original and two copies of bound thesis. Forwarded to the Dean, Post Graduate Studies, RAJUVAS, Bikaner through the Dean, College of Veterinary and Animal Science, Bikaner.

Head

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Peculiarities of anatomy and physiology of head of camels are such as mandible, soft palate and long neck predisposes the animal. Surgical affection of head and neck region as far as mandible is concerned, the presence of the alvioli of tushes, long Interdental space and mantel canal makes horizontal ramus weak at this site hence fractures of mandible are common in camels. Lower jaw fractures mainly occur during breeding or the rut season when a vicious male camel bites or fights with other camels. It also results following a tendency to grip or bite other stationary objects viz; a tree or poll etc. Fractures are caused by stress forces exerted by the powerful constructions of the facial muscle (Quazi, 2010). Soft palate injuries are seen only in adult male camels, particularly during rut season when camel often balloons it. The presence of long neck predisposed to dislocation of vertebra cause torticollis (Gahlot, 2000). The incidence of mandible fracture may be up to 55 per cent of clinical cases (Gahlot and Chouhan, 1994). In the present study it was (23.40%). Fracture of the mandible is the most commonly observed fractures in camels. Bilateral or unilateral (rarely) mandibular fractures are seen across the first premolars or quite cranial or caudal to this point in inter-dental space. These fractures are usually seen during the rutting season. In this season, males become quite active, vicious each other, leading to abnormal stress on the mandible which can cause fracture (Gahlot, 2000). Standard Interdental wiring technique using 2 mm copper wire is the method of choice to repair such fractures. The technique is simple, convenient and economical. The fracture site which needs repeated re-adjustment of the wires to keep otherwise it may lead to delayed union with downward mal-alignment or even non-union of the fracture. Development of sub-mandibular abscesses is a very common postoperative complication of these fractures and can lead to osteomyelitis if not drained and treated in time. Similar technique with the same postoperative complication has also been described by Gahlot et al. (1984), Gahlot and Chouhan 1992, 1994, Gahlot 2000, Quazi 2010, Quazi and Gahlot 2012). Mandibular fractures have also been repaired by silver wiring (Gahlot et al., 1984), bone plates (Kumar et al., 2007a), reinforced brass rod IDW technique (Ram, 1997 and Ram and Gahlot, 2001) and plaster of Paris bandaging (Lavania 1998 a Choudhary (2009) used IM pinning for the repair of bilateral mandibular fracture. Steinmann pin of 4-6 mm diameter provided satisfactory immobilization at the site of fracture. In the present study all the types of mandibular fracture immobilized with IDW technique. Oblique and multiple mandibular fractures were repaired by transfixation techniques and bone plating. Similar were the observations of Kumar et al., (1979), Gahlot et al., (2007a) and Siddiqui et al., (2012).

Soft palate injuries are seen only in adult male camels, particularly during rut season when camel often balloons it. It gets injured either with its own teeth, or by biting of offender camel or by external trauma. The injury results in tear in a mucosa and rupture of blood vessel of the soft palate or “Gulla”. In case the injured gulla remains trapped or retract in. In either case, the animal remains off feed and keeps the neck stretched. It daily increases in size due to the pressure over blood vessels and resultant oedema. Sometimes, abscessization of gulla was seen. Soft palate was resected from the base under xylazine sedation. Soft palate caught with towels and gradually pulled out. It is cut away from the base using handle (metzebeaum) scissors. Similar observations were made by Ramadan (1994), Dudi and Gahlot (2003), Gahlot et al., (2004), Gahlot et al., (2007a).

Buccal and salivary fistula develops as swelling over upper and lower cheek area at the level of cheek teeth and subsequently bursts can be observed. Development of sub-mandibular abscesses is a very common postoperative complication of these fractures and can lead to osteomyelitis if not drained and treated in time. Similar technique with the same postoperative complication has also been described by Gahlot et al. (1984), Gahlot and Chouhan 1992, 1994, Gahlot 2000, Quazi 2010, Quazi and Gahlot 2012). Mandibular fractures have also been repaired by silver wiring (Gahlot et al., 1984), bone plates (Kumar et al., 2007a), reinforced brass rod IDW technique (Ram, 1997 and Ram and Gahlot, 2001) and plaster of Paris bandaging (Lavania 1998 a Choudhary (2009) used IM pinning for the repair of bilateral mandibular fracture. Steinmann pin of 4-6 mm diameter provided satisfactory immobilization at the site of fracture. In the present study all the types of mandibular fracture immobilized with IDW technique. Oblique and multiple mandibular fractures were repaired by transfixation techniques and bone plating. Similar were the observations of Kumar et al., (1979), Gahlot et al., (2007a) and Siddiqui et al., (2012).

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According to Gahlot (2000), keratitis occurs due to irritation caused by a foreign body for a longer period. Sometimes foreign bodies were piercing cornea results in the keratitis. Chronic keratitis may lead to corneal ulcers, conjunctivitis, excessive lachrymation and blepherospasm. Keratitis treated with 2-3 subconjunctival injection of dexamethasone 15-20 mg prednisolone is enough in a single dose. Corneal ulcers are touched with a small pledget dipped in 2.5% of tincture of iodine or 1% silver nitrate solution. Antibacterial eye drops were instilled for 2-3 weeks till ulcer healed. Some practitioners prefer subconjunctival injection of penicillin 3,00,000 units; chloramphenicol or polymixin B ointment topically and 1% atropine sulphate topically.

Corneal opacity most commonly occurred in camels. Corneal opacity of mild, moderate or severe forms occurred due to the external trauma, cloudiness of the cornea, in moderate form there was diffuse cloudiness of the cornea but in severe opacities apart from dense cloudiness a ring of blood clots all around the opacity was observed. Such opacities are not associated with any infection and quickly respond to 2-3 subconjunctival injection of corticosteroids15-20 mg. Similar were the same opinion of Gahlot (2000), Dudi and Gahlot (2003), Denis (2004) and Bishnoi and Gahlot (2004).

In case of kerato-conjunctivitis, the etiology associated were external trauma, foreign particles, plant juices (Aak). Keratoconjunctivitis showed a varying degree of corneal opacity. The lachrymation and blepherospasm were more severe than observed in conjunctivitis. Keratoconjunctivitis was being treated with keratoconjunctivitis, subconjunctival injections of dexamethasone and gentamicin along with topical gentamicin gave good results, while in cases where irritant juices or plant milk or any foreign particle were the etiological factors, hydrocortisone containing gentamicin eye drops were used with subconjunctival injections of gentamicin. Keratoconjunctivitis was suspected subconjunctival injections of dexamethasone 15-20 mg and gentamicin 30-40 mg along with topical instillation of chloramphenicol eye drops four drops daily and parenteral administration of streptopenicillin gave favorable results. Chawla et al., (1993) Gahlot (2000), Dudi and Gahlot (2003) and Bishnoi and Gahlot (2004) were of the same opinion.

Gitao and Kabra (1992) reported traumatic kerato-conjunctivitis and discharging greenish pus. They found corneal opacity, profuse lachrymation, blepharospasm, photophobia and squinting as associated signs. The tetracycline ointment treatment was given based on the antibiotic sensitivity test. Keratitis, foreign body in the eye, iris, prolapse and enucleation were the same opinion of Gahlot and Chouhan (1992).

Conjunctivitis is commonly seen in camels due to the action of an irritant or foreign body which remains trapped underneath the eyelid e.g., sand, grit, leaves or thorns, juices of irritant plants. Conjunctivitis was clinically manifested as swollen and hyperaemic conjunctiva, chemosis, blepharospasm and epiphora. Conjunctivitis was treated with Dexamethasone 15-20 mg and Gentamicin 30-40 mg for 3 days and topical instillation of gentamicine eye drops, 4 drops bid, for 4 days showed good results. Gentamicin for at least 7 days was then advised to the owner and cases were discharged. In two cases, where corneal opacity developed, chloramphenicol placed of gentamicin and the opacity resolved in 8-10 days. Rathore (1986), Chawla et al., (1993), Gahlot (2000), Yeruh et al., (2002), Dudi and Gahlot (2004) were of the same opinion.
xylazine @ 0.3 mg/kg body weight intravenously. In case of eye laceration, Infraorbital nerve block was performed towards affected site. The Lacerated skin edges were excised by scalpel. Vertical mattress sutures were applied by using silk. Injection oxytetracycline 1500 mg administered intramuscularly for 3 days, postoperatively. Sutures were removed after 12 days. Similar observations and treatment adopted by (2007a).

The presence of long neck predisposes camel to dislocation or luxation of vertebra causing torticollis. These dislocations result from sudden falling of a camel on the ground or following an automobile accident causing blunt trauma to the neck. Sometimes sprain and fracture of cervical vertebra may occur together. These dislocations may exhibit distortion in the shape of the neck at the dislocation site and inability to hold the neck. Such animals prefer to lie down or keep neck rested over the ground in sitting pendulous movement from left to right or vice-versa, when animal attempts to hold the neck in the air. Such animals do not get up. These dislocations are managed by extern coaptation splinting over the neck and stall rest for 8-10 weeks. Dresher et al., (1981), Gahlot (2000), Dudi and Gahlot (2003), Al Sobayil and Mousa (2009), Dioli (2010), and Gahlot (2012) also have similar experience.

Agab and Ahmed (2003) also reported S-shaped bend of neck in camel. The affected camels were seropositive for brucellosis. However, in animals of present study serological diagnosis not made for brucellosis.

Dermoid cysts are congenital hyperplasia of skin and the sheat of prediction located at neck close to jugular furrow in camel. Tyagi and Singh (2006) also described dermoid cysts in the camel which were often located above the jugular furrow. These were carefully excised surgically without rupturing the capsule or rupturing the underneath jugular vein. These were often mobile, soft, fluctuating and were not attached to the overlying skin. The diameter varies from 5 to 15 cm and its inner surface may be divided into several compartments (honey comb) containing hair tufts and a coffee colored glandular secretion (Gahlot).

Tumors were recorded in the present study are oral tumor, cheek tumor and neck region tumor. However, Yousif et al., (1987) reported most common locations of dermoid cysts in camel on the upper part of the neck at its antero-lateral aspect just over or near the jugular vein. Tumors were divided into four categories although some overlap may occur: tumors of epithelial origin, round cell tumors, tumors of mesenchymal origin and tumors metastatic to the skin.

Histopathological examination of the tumor of the present study revealed fibroma. Wounds healed at normal rate following surgical excision. No tendency of metastasis was recorded. Similar observations were made by Ramadan and Hassan (1989) and El-Meligy et al., (2006) in camel.
through cleaning of wound with mild antiseptic solution in camels, then washing with clean water and dressing with weak solution of iodine, boric acid and Purohit and Chouhan (1992) described a detailed study of wound healing in camels by using of neem oil (Azadiracta indica), protomine, zinc, insulin and urea.

In the majority of cases of the present study, the antibiotics given were oxytetracycline, streptopenicillin, a combination of ampicillin and cloxacillin, and used as popular nonsteroidal antiinflammatory drugs to treat the cases. Gahlot and Chouhan 1992 and Gahlot 2000 were also on the same view. The study on the efficacy of some antibiotics against bacteria, with special reference to *Staphylococcus aureus* isolated from wounds and abscesses in the skin, was evaluated. Most of the Gram positive isolates were sensitive to amoxicillin, contrimoxazole, trimethoprim, gentamicin, streptomycin, chloramphenicol, kanamycin, doxycycline hydrochloride, ciprofloxacin and neomycin. The inhibition of Gram positive isolates was recorded with erythromycin. The majority of these organisms were resistant to penicillin, ampicillin, bacitracin, lincomycin, sulfamethizole and sulfadiazine. Most of the Gram negative isolates were sensitive to ampicillin, chloramphenicol, gentamicin, norfloxacin, trimethoprim and ciprofloxacin. An intermediate response to these isolates was recorded for these isolates.

Animals of the present study majority of camels were sedated with xylazine @ 0.3 mg/kg body weight, intravenously. The surgical intervention was generally carried out without any struggling. However, Gahlot et al., (1994) tranquillized the camel with diazepam @ 400 mg, i.V., Peshin et al., (2011) studies clinical evaluation of medetomidine hydrochloride (6.0 µg/kg) as a sedative in surgical intervention.

The incidence of surgical affections of head and neck region was found more in male compared to female camels, possibly because local people usually keep male camels for draught purposes. The overall occurrence of diverse surgical affections recorded in male and female camels was 117 (84.78%) and 21 (15.21%), respectively. The occurrence of diverse skin affections recorded in male and female camels was 84.32% and 15.68%, respectively.

The occurrence of surgical affections of head region was found to be higher (89.13%) than of the neck region (10.86%), in the present study. The occurrence of surgical affections of skin of head and neck to be highest (41.17%) followed by those of thorax and abdomen (17.64%); inguinal, scrotal, sheath and tail and generalised skin affections (9.80%). Quazi and Gahlot (2012) discussed surgical affections of musculo-skeletal system of camels (*Camelus dromedarius* region. The occurrence of surgical affections of musculo-skeletal system of head/neck and thoracic region was 53.13% and 46.87% respectively.

The incidence of surgical affections in the present study was found mandible fracture (31.15%) followed by lacerated nostril (7.24%), corneal opacity (5.79%), eyelid laceration (5.07%), conjunctivitis (5.07%), soft palate injury (3.62%) and remaining affections in declining order. However, Patel et al. of camel such as wound 60.33%, sinus/ fistula/ abscess 2.88%, gangrene 1.20% and neoplasm 6.73%.

In retrospective, investigation, the incidences of surgical affection in male and female were 87.80% and 12.19%, respectively. However, Patel et al. of camel such as wound 60.33%, sinus/ fistula/ abscess 2.88%, gangrene 1.20% and neoplasm 6.73%.

Congenital abnormalities were recorded in retrospective study were descemetocele and subconjunctival haemorrhage. However, Bishnoi (1995), Gahlot (2000),
wound healing is caused by depletion of blood supply and abnormal anatomical disposition of cellular structures. The belief in slower wound healing in camel has arisen probably due to the nature and location of the commonly encountered wounds in camels and their susceptibility to secondary complication. Other problem is the pastoralist lifestyle to usually delay seeking veterinary attention or to attempt to apply traditional remedies to wounds.

It is an often held belief that wound healing is slower in camel than in other mammals. In animals of the present study, the earliest clinical healing time observed was in those cases where surgery was done and healing occurred by first intention. Longest healing time observed was in cases of chronic wounds because of the severe infection. Similarly these observations also supported by Zindoliya (2009). However, Wilson (2005) discussed the principles of early wound management. The wound healing can be positively influenced by dispensing appropriate treatment in the first few hours after injury. Positive actions in the early period include hemostasis, meticulous cleansing and debridement of the wound, the use of the wound, closure (if indicated) with minimal tension on the suture line and the judicious use of drains.

The results of the present investigation revealed that strict aseptic measure with gentle handling of the tissue and guarding against postoperative contamination leads to ideal healing. In addition, proper surgical interference and management of open granulating wounds with or without cavitation, cleansing, debridement, irrigation or flushing of wounds by the use of 5% potassium permanganate solution along with proper parental administration of antibiotics and gentle application of different preparations and rest gave faster healing.

Careful clinical judgement, early surgical management with gentle handling of tissue, aqua therapy or through wound irrigation, effective topical medication and sufficient rest brings about quick and better recovery in clinical and surgical wounds in the camels.

2. Incidence/occurrence of the affections.

These surgical affections were classified in 2 categories as under.

A. Classification according to region

i. Head region
   - mandible fracture 43 (31.15%)
   - lacerated nostril 10 (7.24%)
   - corneal opacity 9 (6.52%)
   - laceration 7 (5.07%)
   - conjunctivitis 7 (5.07%)
   - wound at nostrils 6 (4.34%)
   - wound at head region 5 (3.62%)
   - soft palate injury 5 (3.62%)
   - salivary fistula 3 (2.17%)
   - corneal ulcer 3 (2.17%)
   - keratitis 3 (2.17%)
   - keratoconjunctivitis 2 (1.44%)
   - corneal laceration 2 (1.44%)
   - oral tumor 1 (0.72%)

   Surgical affections of head region included mandible fracture 43 (31.15%) followed by lacerated nostril 10 (7.24%), corneal opacity 9 (6.52%), laceration 7 (5.07%), conjunctivitis 7 (5.07%), wound at nostrils 6 (4.34%), wound at head region 5 (3.62%), soft palate injury 5 (3.62%), salivary fistula 3 (2.17%), corneal ulcer 3 (2.17%), keratitis 3 (2.17%), keratoconjunctivitis 2 (1.44%), corneal laceration 2 (1.44%), oral tumor 1 (0.72%), and cheek...
In male camel among the affections of head region highest incidence was of mandible fracture 41 (29.71%) followed by lacerated nostril 7 (5.07%), abscess 7 (5.07%), eyelid laceration 5 (3.62%), conjunctivitis 6 (4.34%), wound at nostrils 5 (3.62%), wound at head region 3 (2.17%), soft palate injury fistula 3 (2.17%), gingivitis 2 (1.44%), corneal ulcer 3 (2.17%), keratitis 3 (2.17%), keratoconjunctivitis 2 (1.44%), corneal laceration 2 (1.44%). whereas, in female highest incidence was of lacerated nostril 3 (1.44%) followed by mandible fracture 2 (1.44%), wound at head region 2 (1.44%), eyelid laceration 2 (1.44%), submandibular abscess 1 (0.72%), wound at nostrils 1 (0.72%), gingivitis 1 (0.72%), conjunctivitis 1 (0.72%).

In male camel among the affections of neck region highest incidence was of dermoid cyst 4 (2.89%) followed by tumor at neck 2 (1.44%), contusion and abrasion at neck region 2 (1.44%), torticollis 1 (0.72%) whereas in female highest incidence was of torticollis 1 (0.72%), tumor at neck 1 (0.72%), contusion and abrasion at neck region 1 (0.72%).

The incidence of surgical affections of head region recorded in male and female camels was 106 (76.81%) and 17 (12.31%), respectively. The region in camels recorded in male and female camels was 11 (7.97%) and 4 (2.89%), respectively.

The overall occurrence of diverse surgical affections recorded in male and female camels was 106 (87.60%) and 15 (12.39%), respectively.

C. Classification according to season

i. Summer
ii. Winter
iii. Rainy

The incidence of surgical affections of head region in camels recorded in the summer, winter and rainy season was 32 (23.18%), 69 (50.00%) and 22 (15.94%) respectively.

The incidence of surgical affections of the neck region in camels recorded in the summer, winter and rainy season were 5 (3.62%), 7 (5.07%) and 3 (2.17%).

The overall occurrence of surgical affections was found to be highest winter season 76 (55.07%) followed by summer 37 (26.81%), rainy 25 (18.11%).

D. Classification according to age
The overall occurrence of surgical affections was found to be highest in 6-9 years age group 67 (48.55%) followed by above 9 years age group and below 3 years age group 6 (4.34%) respectively (Table 4 & graph 5).

4. Retrospective study for last ten years (2001-2010)

A detailed retrospective study for last ten years (2001-2010) for surgical affections of head and neck region describe as:

A. Region wise study

The number of diverse surgical affections of head and neck region, recorded in camels enlisted in table 5.

In the head region maximum affections recorded were mandible fracture 213 (23.40%) followed by wound at head region 98 (10.76%), maggot wound 85 (9.34%), corneal opacity 67 (7.36%), submandibular abscess 65 (7.14%), salivary fistula 48 (5.27%), eyelid laceration 43 (4.72%), buccal fistula injury 26 (2.85%), lacrimal discharge of eye 23 (2.52%), conjunctivitis 19 (2.08%), xerophthalmia 7 (0.76%), facial nerve paralysis 6 (0.65%), ruptured eyeball (0.54%), keratoconjunctivitis 4 (0.43%), keratitis 3 (0.32%), descemetocele 1 (0.10%), subconjunctival hemorrhage 1 (0.10%).

In the neck region maximum affections recorded were neck injury 9 (0.98%) followed by torticollis 8 (0.87%), tumor at throat 6 (0.65%), dermoid cyst 5 (0.54%), Poll gland abscess 2 (0.21%).

The occurrence of affections was higher in head region 878 (96.48%) then in neck region 32 (3.51%) (graph 6).

B. Sex wise study

The number of diverse surgical affections was recorded according to sex in camels enlisted in table 6.
xerophthalmia 3 (0.32%), keratoconjunctivitis 3 (0.32%), prolapse of third eyelid 3 (0.32%), torticollis 3 (0.32%), buccal fistula 2 (0.21%), tumor at throat 2 (0.21%), lacrimal discharge of eye 1 (0.10%), keratitis 1 (0.10%), oesophageal obstruction 1 (0.10%).

Out of 910 cases recorded, 799 (87.80%) were males and 111 (12.19%) were females (graph 7).

C. Season wise study

The number of diverse surgical affections was recorded according to season in camels enlisted in table 7.

In the summer season maximum affections recorded were mandible fracture 37 (4.06%) followed by wound at head region 32 (3.51%), lacrimal discharge of eye 29 (3.18%), corneal opacity 21 (2.30%), submandibular abscess 21 (2.30%), buccal fistula 14 (1.53%), salivary fistula 13 (1.42%), eyelid laceration 12 (1.32%), eye injury 9 (0.98%), conjunctivitis 6 (0.65%), xerophthalmia 4 (0.43%), neck injury 4 (0.43%), torticollis 3 (0.32%), facial nerve paralysis 2 (0.21%), dermoid cyst 2 (0.21%), tumor at throat 2 (0.21%), ruptured eyeball 1 (0.10%), keratoconjunctivitis 1 (0.10%), oesophageal obstruction 1 (0.10%).

In the winter season maximum affections recorded were mandible fracture 147 (16.15%) followed by wound at head region 45 (4.94%), soft palate injury 28 (3.07%), salivary fistula 28 (3.07%), submandibular abscess 27 (2.96%), maggot wound at nostrils 26 (2.85%), eye injury 10 (1.09%), conjunctivitis 10 (1.09%), lacrimal discharge of eye 7 (0.76%), torticollis 5 (0.54%), ruptured eyeball 4 (0.43%), facial nerve paralysis 4 (0.43%), xerophthalmia 3 (0.32%), prolapse of third eyelid 3 (0.32%), dermoid cyst 3 (0.32%), neck injury 3 (0.32%), tumor at throat 3 (0.32%), descemetocele 1 (0.10%), subconjunctival haemorrhage 1 (0.10%), oesophageal obstruction 1 (0.10%).

In the rainy season maximum affections recorded were maggot wound at nostrils 42 (4.61%) followed by mandible fracture 29 (3.18%), wound at head region 17 (1.86%), submandibular abscess 17 (1.86%), corneal opacity 9 (0.98%), eyelid laceration 9 (0.98%), salivary fistula 7 (0.76%), eye injury 7 (0.76%), lacrimal discharge of eye 6 (0.65%), conjunctivitis 3 (0.32%), neck injury 2 (0.21%), facial nerve paralysis 1 (0.10%), ruptured eyeball 1 (0.10%), tumor at throat 1 (0.10%).

The overall occurrence of surgical affections was found to be highest winter season 472 (51.86%) followed by summer 259 (28.46%), rainy 179 (19.67%) respectively.

D. Year wise study
The incidence of congenital affections were 2 (0.21%) and acquired affections were 908 (99.78%). Descemetocele 1 (0.10%) and subconjunctival haemorrhage 1 (0.10%) congenital category was recorded.

An overview of ten year's retrospective study revealed that there was maximum occurrence in year 2001 (13.40%) followed by year's 2002 (11.75%), 2003 (11.75%), 2005 (10.65%), 2004 (9.78%), 2006 (9.45%), 2008 (9.01%), 2009 (8.57%), 2007 (8.02%), and 2010 (7.58%) (graph 9).

E. Analysis of results

The analysis of results has been described under two sub headings:

1. Present study
2. Retrospective study

1. Present study

An overview of the present study revealed that there was a maximum occurrence of mandible fracture (31.15%) followed by lacerated nostril (7.24%) abscess (5.79%), eyelid laceration (5.07%), conjunctivitis (5.07%), soft palate injury (3.62%) and remaining affections in declining order. Mandible fracture during the rut season due to vicious behaviour of camel or accidental trauma. Laceration of nostril occurred due to pulling of nose halters attached to the nose pegs in untrained camels trauma caused corneal opacity of mild, moderate or severe forms in camels. Blunt trauma or foreign body caused submandibular abscess. Laceration edges with sharp objects or fixtures like hooks, nails etc., of the camel cart during involuntary rubbing of the facial region by the camel. Continuous irritation or inflammation conjunctivitis. During breeding season soft palate injured either with its own teeth or by biting of offender camel or by external trauma.

The occurrence of surgical affections of head region was found to be higher (89.13%) than neck region (10.86%). The maximum cases in head region, was of mandible fracture (31.15%) which mostly occur during rut season.

The incidence of diverse surgical affections in the present study was in male and female camels 87.60% and 12.39%, respectively. The incidence was found more in male camels, possibly because local people usually keep male camels for draft purposes.
The efficacy of these treatments was analysed in terms of healing of wounds and fractures. A special attention was given to protect the wound contamination because in the present study most of the camels were used for draft purpose simultaneous during the treatments; hence these had a risk of wound contamination.

The healing time of various wounds which included surgical and clinical wounds, both varied from 10-30 days.

Healing of surgically created wounds in cases of soft palate resection, oral tumor, tumor at neck, lacerated nostril and eyelid take place in 10 to 12 days because there however, where infection was present or site was prone to develop infection such as cheek tumor took more time to heal.

Healing of mandible fracture took place in 30 to 45 days or even more because of mal union and the movement of the lower jaw. Healing of lacerated nostril, lacerated eyelid, corneal opacity, abscesses at neck, submandibular abscesses, wounds of nostril took place in 30 to 90 days. However, longest healing time observed was in cases of severe corneal opacity.

Healing of superficial wounds like abrasion wound, contusions, laceration wounds took place in 12-18 days following an appropriate debridement.

Open wound needed debridement and irrigation with light potassium permanganate solution and dressing with either a topical ointment or spray. In all cases broad spectrum antibiotics and nonsteroidal anti-inflammatory drugs were given.

2. Retrospective study

An overview of ten years retrospective study revealed that there was a maximum occurrence of mandible fracture fracture 213 (23.40%), maggot wound at nostrils 97 (10.65%), lacerated nostril 85 (9.34%), corneal opacity 67 (7.36%), submandibular abscess 65 (7.14%), salivary fistula 48 (5.27%), eyelid laceration of palatine 28 (3.07%) and remaining affections in declining order. Mandible fracture occurs due to fighting with another camel during rut season or accidental trauma occurred due to pulling of nose halters attached to the nose pegs in untrained camels. External trauma caused corneal opacity of mild, moderate or severe forms of the body caused submandibular abscess. Laceration of the eyelid was hooking of the eyelid or its edges with sharp objects or fixtures like hooks, nails etc., of the camel cart during involuntary rubbing of the facial region by the camel. Continuous irritation or inflammation of the eye caused the conjunctivitis. Salivary fistula occurs due to the lodgement of salivary duct into the oral cavity. During the breeding season camel got injured either with its own teeth or by biting of offender camel or by external trauma.

An overview of ten years retrospective study revealed that 87.80% were males and 12.19% were females. The incidence was found more in male camels, possibly because local people
An overview of ten years retrospective study revealed that there was a maximum occurrence in year 2001 (13.40%). The cases reported in clinics decreased from 13.40% (2001) to 7.58% (2010). This is possibly due to decrease camel population, awareness in farmers and nearby treatment facilities for less reporting the camel cases in subsequent years.

LITERATURE CITED


REVIEW OF LITERATURE

In one of the earlier studies, Cross (1917) advised through cleaning of wound with mild antiseptic solution in camels, then was washed with clean water and dressing with weak solution of iodine, boro-iodoform powder, zinc oxide powder or ointment.

Leese (1927) reported mandibular fracture in camels, which occurred due to the chain of bridle. Fractures were immobilized with fracture line. Injury to the gingiva was noticed. Immobilization was supported with an iron splint.

Curasson (1947) found acquired entropion, ectropion and trichiasis in camel, occurred due to conjunctivitis, wounds of eyelids, by the pricks of tents, tear was advised to be sutured. Blepharitis was also observed due to trauma.

Beckenhauser (1956) opined that a separated symphysis might be fixed by I.D.W or by Krischner’s drill wire or Steinman pin in any of these methods, Inter dental wiring, bone plated, Krischner’s or stader splint and cross pins.

Rathore and Singh (1963) treated two clinical cases of mandibular fracture in camels. One stainless steel pin was fixed at right angle to the median plane in each the same was repeated on the fragment of another side. The fracture was reduced with a well padded plywood splint (2X6”) put under the free ends of all the four pins. Both the jaws were apposed with a bandage which was removed after one hour.

Singhvi and Bhargava (1971) believed that the prevention and treatment of postoperative wound infection is problematic in camels due to abnormal anatomical disposition of cellular structures but the evidence in support of this hypothesis was not documented.

Chouhan (1972) studied twenty cases of mandibular fracture in camels, both clinically and experimentally. These were repaired
week, when the pin and plaster of paris bandage were removed, the holes left behind healed up on routine dressing. The injury of mucous membrane also healed up without any complication.

Kumar 

et al., (1979) noticed unilateral fracture of mandible in 10 to 15 years old camels. Camels were presented with the complaint of restricted prehension and rumination. Fracture was immobilized by using four inch Eggers stainless steel bone plates, plates were fixed with cortical stainless steel screws. Animals were kept on liquid diet (milk, porridge and gur) for one week. The upper and lower jaw was tied with one inch wide leather strap and

As per Peshin et al., (1980) When xylazine was given intramuscularly to 12 apparently healthy adult camels (Camelus dromedarius) at the rate of 0.4 mg/kg, mean values for onset of weak time, down time, and time until recovery were 8.6 +/- 1.1, 10.5 +/- 0.6, and 150 +/- 56.9 minutes, respectively. Mild salivation, drooping of lower lips, and relaxation of neck were observed at mean times of 15.3 +/- 4.9, 11.0 +/- 1.7, and 22.7 +/- 3.9 minutes, respectively. Analgesic effects lasted for 60 to 90 minutes. Changes were not statistically significant. Marked hyperglycemia was observed at 30 minutes after xylazine administration. Hypotension was not correlated with elevated central venous pressure or with bradycardia. Electrocardiography revealed 1st-degree atrioventricular block, sinoatrial block, and wandering pacemaker in sinoatrial node, which were attributed to vagal stimulation. Primary T-wave changes and ST segment elevations were observed. Xylazine was used at the same dosage in 13 clinical cases involving surgery of short duration, it proved to be a satisfactory sedative, analgesic, and muscle relaxant.

Dresher et al., (1981) described torticollis in camels which occurs due to fracture of vertebrae, sprain or dislocation due to trauma, and most commonly. The fracture of transverse process managed by external support with coaptation splint over the neck and stall rest of about six weeks.

Gahlot et al., (1984) described silver wiring to immobilise bilateral mandibular fractures in 25 camels under triflupromazine hydrochloride anesthesia. Abscess reported in all the camels and was treated successfully. Clinical union was observed in 45-120 days.

Purohit et al., (1984) recorded five cases of irreparable mandibular fracture in camels. In all cases fracture occurred in male camels close to root of canine teeth and fragments were visible due to loss of mucous membrane, necrosis and suppurations were also noticed. The loss of sensation at the proposed site of incision was the guide of onset of anaesthesia. Non-union or unwanted mal-union occurred in irrespective of method of immobilization. Thereafter amputation of anterior fragment of mandible was carried out in all cases.

Rathore (1986) described that conjunctivitis can be due to a blow over the eyeball or rubbing of the eye against some hard object to get relief from irritation over the lids; Injury while browsing on thorny bushes, irritating juices of certain plants such as aak, kheep and cactus. The associated signs were swollen eyelid, partially or complete...
Some of the eye affections of the dromedary camel viz; xerophthalmia, carcinoma of the eye, abscess at supraorbital fossa, conjunctival abscess, rupture of the eye ball and lacerated eye lids have been identified and reported by Gahlot et al., (1986).

Lymphosarcomas form solid masses of uniformly textured tumours found mainly in lymph nodes, spleen, thymus and other lymphocytic organs and occasionally in other organ systems. In camels the tumour affects the mandibular and cervical lymph nodes (Yousif et al., 1987). These nodes are firm, covered with up to 1 cm diameter. Blood pictures may show a slight leukocytosis but marked lymphocytosis. An accessible node may be biopsied under sedation.

White et al., (1987) studied that the effects of either xylazine (0.25 mg/kg) intramuscularly, ketamine (5.5 mg/kg) intramuscularly, or a mixture of xylazine (0.15 mg/kg) and ketamine (2.5 mg/kg) intramuscularly on sedation, analgesia, cardiac and respiratory rates, body temperature and muscle relaxation were studied in camel. Either drug used separately was suitable for sedation and analgesia in the camel. However, the mixture of xylazine and ketamine improved muscle relaxation, less central nervous system irritability and shorter recovery times than camels sedated with ketamine alone.

Gahlot et al., (1989 a) evaluated interdental wiring (I.D.W) technique for mandibular fracture repair in 78 camels. The fractures resulted from fighting among male dromedaries during rutting season. It was concluded that I.D.W was a suitable, economical and practical technique for transvers, oblique and multiple fracture in camels.

Gahlot et al., (1989 b) treated paralysis of tongue in caused by pharyngeal swelling in five camels with the appropriate use of antiparasitic medication. Parsania et al., (1989) repaired bilateral mandibular fracture in a four year old camel. Animal had violent fight with another camel and had a mandible causing hanging of lower jaw. Animal was administered 10 per cent chloral hydrate solution (760 milliliter) intravenously to achieve deep narcosis. Steinmann's intramedullary pins, by retrograde method of pinning were used for immobilization of fractured mandible. Pins were drilled up to level of

According to Purohit et al., (1989) camel (Camelus dromedarius) seems to be affected more commonly by dermoid cysts as compared to other cutaneous cysts. However, from one reference (Monteverde, 1935), the dermoid cyst has not been reported in the camel. This report documents dermoid cysts having bilateral dermoid cysts at the similar site.

Ramadan and El Hassan (1989) discussed fibromatosis in camel. Fibromatosis were groups of non-metastasising tumours in the camel. The tumor was mainly found in front of the chest and sternum occupying the tissue.
Purohit (1990) did experimental and clinical studies on wound healing in camel. Neem oil (Azadirachta indica), protamine zinc and topical medicaments for detailed study of wound healing in camels. Saddle gall are more frequently encountered in camels, may be up to 50 per cent of clinical cases presented in the camel. Poorly fitted saddles causes constant irritation and results in pressure necrosis. This act as a seat of infection and with the movement of the part lead to development of sinus or fistulous opening on wither or any region of back. The wound may be aggravated by movement of the animal, separation of wound lips as animal walks. Mechanical delays wound healing. Carefull clinical judgement, surgical management, aqua therapy and rest brings about quick recovery in clinical wounds in the camels.

Ramadan (1990) reported that fractures of the lower jaw of camels are predominantly bilateral and compound in nature and occur with other camels. Unilateral fractures are not common. The fractures lines in most cases located in front of canine teeth of the lower jaw, reasonable jaw stability. The clinical experience and surgical treatment of about fifty cases of such fractures were highlighted.

Ramadan and Abdin Bey (1990) discussed 47 cases of lower jaw fractures in camels. Forty two of these were bilateral and compound in nature and occurred mostly during the rutting season as the result of fighting with other camels, while the remaining 5 had unilateral fractures. Surgically each bilateral fracture was fixed in position by two plates on either side, with great success. Unilateral fractures were either fixed with one plate or treated conservatively. The possible role of trauma and low serum calcium and phosphorus levels was highlighted.

Ali et al., (1991) used forty infected and 6 control camels to study camel contagious ecthyma. Lesions were mainly confined to the skin around the lips occasional involvement of the mucocutaneous junctions and the mucosa of the mouth. The skin in such areas was ulcerated, sometimes haemorrhagic and covered with firmly attached brown scabs of different sizes and shapes.

Gahlot (1991) immobilized or treated the bilateral mandibular fractures with interdental wiring, transfixation or partial mandibulectomy, 15 compound and 15 were simple. The interdental wiring was used for all kinds of mandibular fractures and provided good immobilization, the transfixation technique was used in oblique fractures only but had many associated disadvantages and required general anaesthesia. The partial mandibulectomy was performed in case of non union, short or necrosed anterior fragment. It was concluded that on the basis of clinical trials and observations recorded the interdental wiring is the most suitable, economical and practical technique for repair of fractures of horizontal rami of the mandible in camels.

Nuss et al., (1991) studied the results of a retrospective investigation of 25 cases of mandibular fractures in cattle. Nineteen animals were treated and 6 slaughtered without therapy. Five cases of unilateral fracture of the pars molaris healed with conservative therapy, whereas the same method of treatment was unsuccessful in four cases with compound fractures.
David et al., (1992) treated bilateral fractures of the horizontal rami of the mandible in an adult male camel. Cross-pin fixation was used to stabilize the fractures. Healing was complicated by formation of a large sequestrum and involucrum at the fracture site. Following sequestrectomy, the fracture healed and the camel was clinically normal 1.5 yr after surgery.

Dioli and Stimmelmayr (1992) reported that singular or multiple external and internal abscesses were very common health problems seen in camels. In adult animals, abscessation was usually a sequel to traumatic skin penetration. Infected fighting and puncture wounds caused by thorns, wounds from predators, ectoparasites, and faulty or nonsterile administration of veterinary drugs can lead to single or multiple subcutaneous abscess formation. Lacerated lymph nodes were a common feature in camels.

According to Fowler (1992), camel may bite each other and lacerations may occur on the lips, cheeks, face. Debridement and thorough cleaning of the wound is essential. The skin of camelids is relatively thicker than that of other species; however, there is less flexibility in the skin and it is more tightly adhered to underlying structures, making reconstructive surgery more difficult. Tension sutures may be used in camels.

Gahlot and Chouhan (1992) reported that camels suffer from a variety of surgical affections of the head and neck region which markedly affect the value of the animal, draft capacity, and overall performance. Buccal and salivary fistula develop as a swelling over the upper and lower cheek at the level of cheek teeth and subsequently bursts causing local suppuration and oozing of pus of red mixed saliva. They also reported lacerated nostrils following violent pulling of nose 'pegs' halters in camels. Maggots were not encountered. Maggots remain hidden and migrate subcutaneously in a radiating fashion. As the tissue is gradually eaten up, superficial skin becomes swollen, black, necrosed and dry. In advanced cases, maggots will eat away so much of the skin that the nasal bones or even turbinates are exposed. Lacerated nostrils were cleaned with 2.5% tincture of iodine. Edges of lacerated nostrils were debrided and freshened by removing a thin layer of tissue by scalpel blade. Bleeding was arrested by digital pressure. Vertical mattress sutures using silk were inserted to align the edges. Pedunculated or diffuse tumors may be present over the proximal position near parotid gland and also over the distal neck or pectoral region in camels. The abscesses were usually present on supraorbital forehead region or parotid region in camels. Abscesses appear as fluctuating swelling of varying sizes at different regions of the head and neck.

Purohit and Chouhan (1992) described a detailed study of wound healing in camels. Neem oil (Azadirachta indica), protamine zinc insulin, and 1% lidocaine ointment were evaluated as topical medicaments. The experimental study was conducted in 24 camels, divided into 4 groups of 6 each. Full thickness cutaneous excisions were made. The wounds were treated separately with the dressing preparation and with normal saline solution. The healing process was monitored and evaluated by clinical observations and histological sections.
Chawla et al., (1993) described in detail affection of orbit, eye ball, eyelids, membrane nictitans, cornea, conjunctiva, anterior chamber, iris and lens with surgical anatomy, etiology, diagnosis, signs, various surgical techniques and other surgico-therapeutic and therapeutic treatment in camels and other ruminants.

Singh et al., (1993) found the mandibular fracture to be uncommon in bovines and small ruminants but common in camels. In calves because of obstetrical injuries die due to application of a snare for forced extraction of the foetus. Fractures through interdental symphysis is more frequently involved in young calves. In camel, a report of 78 cases showed high incidence on male (72) and these fractures were rarely bilateral as well as unilateral fractures of horizontal ramus were rare due to protection from the masseter pterygoid muscles. Both unilateral as well bilateral fractures of horizontal ramus can be treated successfully using wiring, pins bone plate.

Alhendi et al., (1994) described a slow-spreading mild form of camel pox involving a herd of 100 adult range camels in the Eastern region of Saudi Arabia. The first cases were reported in October 1989. The morbidity rate was 10% with nought morality rate. The herd was not vaccinated against poxvirus and had not experienced an overt infection before. Affected animals had skin nodules which were sporadically distributed mainly at the thigh and leg region with few nodules on the face. The nodules cm in diameter and were dry on surface and hard in texture.

Gitao (1994) reported Mortality among camel calves (Camelus dromedarius) is one of the most serious problems faced by camel herdsmen and, although reasons for this mortality, diseases play a major role. In an investigation of outbreaks of contagious ecthyma in camels in the Turkana district of Kenya, four outbreaks were detected involving only camel calves. The principal lesions were distinct or largely coalesced pustules on the mouth, nose and muzzle. Direct electron microscopy of infected scabs was used to confirm the presence of the virus. Secondary infection of the pustules was common in affected calves. Morbidity in affected herds was 100%, with no adult involvement. Affected calves were unable to suckle properly. In all outbreaks, there was a concurrent outbreak of contagious pustular dermatitis in goat kids in the same household. Contagious ecthyma is an important disease in camels, contributing to calf debility and eventually to high calf mortality.

Khalafalla et al., (1994) reported that contagious ecthyma occurred in 4 herds of free range dromedaries. 29 calves < 1 year of age showed swelling of the head with nodular lesions around the lips. Pustules developed and exuded to form fissured crusts. The mucous membranes of affected animals were haemorrhagic and ulcerated.

Moustafa (1994) examined 4 camels, 6 – 8 years of age, in a herd of 150 during January 1991, with a history of inappetance, emaciation and slight anaemia, revealed...
Ramadan (1994b) described surgical conditions which were peculiar to camels, which the author had worked with for some 20 years. The soft palate bears an extension known as the dulaa (vesica palatina), which can reach a large size and protrude from the mouth, requiring resection. Camels were prone to hernias, rectal and vaginal prolapses, wounds, joint disorders and various other conditions. The book was illustrated profusely with colour photographs taken by the author.

Gahlot and Chouhan (1994) studied 317 cases of fracture in camels recorded over a period of 13 years. The incidence for various regions of the body, i.e. facial skeleton (55.20%), and cervical vertebrae (0.63%) were recorded. Frequency was higher in males (87.69%) than females (12.31%). Head region fractures had the highest incidence (22.08%). A number of techniques were used to treat selected cases.

Gahlot et al., (1994) described the importance of removing the upper canines in case of mandible fracture. The upper canines touch and fumble an attempt to dislodge it. It occurred due to lateral movement of the lower jaw seen after interdental wiring.

Sharma (1994a) recorded in a large herd of camels, varying numbers of outgrowth around their muzzle and eyes. In four camels, there was an inability to feed and milk suck as their normal feeding and milk sucking. The outgrowths or warts were dry, rough, cauliflower-like with a broad base, in majority of the cases. Few of these outgrowths were collected aseptically for histopathology.

Sharma (1994b) reported that a camel aged 4 years was presented with a large sized solid outgrowth, deep purple in colour, at the base of the neck, directed anteromedially. The growth was of two years old. Within a week of the case presentation, the camel started giving foul odour from mouth and was reported off feed since three days. On the next day, these symptoms the camel was found dead. The death must have resulted due to compression of tumour growth on oesophagus causing respiratory distress.

Bishnoi (1995) described the ophthalmic affections in camels. These affections were then classified according to the part of the eye affected. The etiology and diagnosis of these affections was ascertained on the basis of clinical history and examination. The most common affections were keratitis, keratoconjunctivitis, corneal ulceration and rupture of the eyeball. Various surgico-therapeutic or therapeutic treatments adopted for these affections were similar to those described for other animals and were efficacious.

Gahlot et al., (1995) reported laceration of oral commissure in a six months old camel calf and laceration occurred due to an obstetrical hook. Clinical examination revealed exposure of cheek teeth, hanging out of tongue and drooling of saliva through healed tear of oral commissure. The camel continued drooling continuously through this gap which caused a progressive deterioration of the animal. Laceration was surgically repaired under Inforaorbital nerve block operatively, the camel calf was maintained on liquid diet. Oxytetracycline, (Oxysteclin, Sarabhai Ltd.) 2000 mg was administered i.m. for seven days. Sutures were removed on 20th day and recovery was uneventful.
adult animals and in 2 herds of young camels. In all cases, there was 100% morbidity in the affected herds. When young camels were involved, the lesions were limited to the mouth, nose and muzzle as distinct pustular lesions. In adults, there was also extensive oedema of the head and neck.

Ram (1997) repaired mandibular fracture in 54 camels. Out of which 51 and 3 cases were recorded in male and females camels, respectively. Fracture was vertical and oblique in 25 cases and transverse in 29 cases. The etiology of fracture of mandible was biting to other animals (38 cases), falling by lathi blow (6 cases). In all cases of mandibular fracture were treated by the interdental wiring technique was modified and was incorporated with a brass rod, thus named as “Reinforced Brass Rod Interdental Wiring (R.B.R.I.D.W.)” technique with a view to find out the suitable immobilization technique for oblique and multiple fractures of horizontal ramus of mandible.

Wilkie and Whittaker (1997) reported corneal surgery is a common and essential part of veterinary ophthalmology and ranges from simple linear keratotomy to penetrating keratoplasty for restoration of optical clarity. Success in corneal surgery relies on an understanding of corneal anatomy, to detail, microsurgical equipment and techniques, and use of appropriate preoperative, intraoperative, and postoperative medications. Surgical management of corneal disease is indicated for corneal ulceration, excision of a mass lesion, reconstructive procedures, therapeutic indications, optical restoration, and cosmetic purposes.

Khalafalla et al., (1998) described the cases of papillomatosis in camels in different areas. The disease appeared as round, cauliflower like hard nodules on the skin of the lips and the submandibular area without impairing the health of the affected animals. The disease was mild and usually self-limiting, causing a morbidity rate of 3.3% and no mortalities.

Lavania (1998) studied a new, simple, practical and field oriented technique for the repair of mandibular fracture in 18 camels using plaster of Paris bandage and a wooden plate as a splint, was carried out and discussed. The recovery after one and a half-month was uneventful.

Abubakar et al., (1999) recorded sporadic cases of subcutaneous localised and internal abscesses due to in adult and young male and female camels. Abscesses of various sizes were found in the prescapular area, pectoral region, head, both sides of the neck, hind limbs, shoulders and mainly in the liver, spleen, lungs, kidneys, stomach and associated regional lymph nodes.

Anderson (1999) discussed different surgical procedures that are commonly performed in camelids. The diagnosis, anaesthesia, head surgery, wry neck, tooth root abscesses and mandible fracture repair.

revealed bilateral corneal thinning and fibrosis, cataracts with retrolental fibroplasia, and retinal dysplasia. Additional changes in the right globe were anterior segment ruptured lens capsule, chronic phacoclastic uveitis, and retinal separation. The PHA was confirmed in the left eye.

Lynch et al., (1999) described fibrous osteodystrophy of the facial and long bones were diagnosed in four dromedary camels (Camelus dromedarius). Lesions responded to treatment with antiinflammatory medications or calcium supplements. The lesions were probably caused by multiple factors including gastrointestinal parasitism. A critical factor in lesion formation may have been vitamin D deficiency secondary to gastrointestinal malabsorption and inadequate winter exposure to ultraviolet light.

Gahlot (2000) opined that the fracture of horizontal rami of mandible in camels occurred mainly during breeding season either due to infight or due to tendency to grip or bite other stationary objects like tree or pole. Whereas, fracture of vertical rami of mandible caused by external violence or automobile accidents. Clinical signs in camels are downward hanging or inclination of anterior portion of mandible, exposing tongue, drooling of blood tinged saliva, abnormal mobility of fractured fragment, swelling of oral mucosa in simple fracture and wound in mucosa at fracture site in compound fracture. In all cases immobilization were achieved by external fixation technique including percutaneous transfixation technique and internal fixation technique as bone plating, intramedullary pinning and partial mandibulectomy.

Ram and Gahlot (2001) reported 25 camels with bilateral and compound mandibular fractures (oblique, multiple and transverse) treated by Brass Rod Interdental Wiring (RBR IDW) technique.

Straten et al., (2001) reported the first apparent outbreak of camel contagious ecthyma (CCE) in camels (Camelus dromedarius). Out of 150 camels of different ages, morbidity reached 90%; mortality was 0. The disease primarily affected adult camels and only later spread to the young stock. In nearly all cases lesions were located on and around the lips and nostrils.

Yeruh et al., (2002) described an unusual case of entropion, corneal ulcer and corneal haemorrhages in a one-humped camel (Camelus dromedaries). The most prominent clinical findings were entropion of both eyelids, severe blephrospasm, epiphora, conjunctivitis, conjunctival oedema, mucopurulent conjunctival discharge, hyperaemia, lacrimation and photophobia. Corneal ulcers and corneal haemorrhages were also observed.

Al-Dughaym et al., (2003) studied 59 camels with mandibular fractures by clinical and radiographical examination. It was demonstrated that males and females with an average age of 7 years. Unilateral and bilateral fractures with wounds and pus formation were diagnosed through clinical examination. Microbiological tests revealed Proteus mirabilis to be the most frequent isolate followed by Proteus vulgaris, Corynebacterium pseudotuberculosis and Arcanobacterium pyogenes.
Dudi and Gahlot (2003) made a survey of ethno veterinary treatments which was done in 11 districts of Rajasthan (India) for cattle, ruminants and camels. Ninety nine traditional healers were recorded. Common surgical affections included corneal opacity, ruptured eye ball, eye maggot wound, pharyngitis/swelling at throat, camel bite wound, yoke gall, epistaxis, mandibular fracture, wry neck / torticollis in camels.

As per Denis (2004) corneal disease is common in equine ophthalmology and requires vigilant monitoring and appropriate therapy. Diseases, particularly those that progress rapidly, may benefit from surgical intervention. These include descemetoceles, deep corneal prolapse, ulcerative keratitis, corneal stromal abscesses, and corneoscleral neoplasia. Indications for corneal transplantation include cosmetic purposes. Corneal transplantation is most often implemented in equine patients for tectonic and therapeutic reasons when a corneal prolapse, or neoplasia. This article provides an outline of when to consider surgical intervention for corneal disease, the procedures available and expected outcomes, and how appropriate early surgical intervention can dramatically improve the end result.

Bishnoi and Gahlot (2004) recorded the ophthalmic affections in camels over a time-period of two years, these affections were classified according to the part of the eye affected. The etiology and diagnosis of these affections was ascertained on the basis of clinical history and examination. The most common affections were keratitis, keratitis conjunctivitis, corneal opacity, eyelid laceration and rupture of the eyeball. Various surgico-therapeutic or therapeutic treatments adopted for these affections were similar to those described for other animals and were found efficacious.

Gahlot et al., (2004) studied temporary paralysis of tongue in camels. Injuries to soft palate are common in male camels during breeding season caused by biting of own teeth or by biting of offender camel or external trauma. Facial paralysis is occasionally seen in camel but their etiology remains unknown. However, facial paralysis glossoplegia and injured soft palate together has not been reported previously.

Qureshi and Kataria (2004) conducted to investigate the efficacy of some antibiotics against bacteria, with special reference to abscesses in the skin of camels. A total of 70 pus samples from male camels were collected. Most of the Gram positive isolates were sensitive to amoxicillin, trimethoprim, gentamicin, streptomycin, chloramphenicol, kanamycin, doxycycline hydrochloride, ciprofloxacin and neomycin. The intermediate zone of inhibition of Gram positive isolates was recorded with erythromycin. Majority of these organisms were resistant to penicillin, ampicillin, bacitracin, lincomycin, sulfamethizole and sulfadiazine. Most of the Gram negative isolates were sensitive to ampicillin, chloramphenicol, gentamicin, norfloxacin, trimethoprim and ciprofloxacin. An intermediate response to tetra was recorded for these isolates.

occipital and temporal bones. The cornual processes were absent. The supraorbital foramen was in the form of a deep fissure, at the maxillary tuberosity and facial crest. The pre maxilla had a dorsomedially concave and narrow pointed body. The nasal bones were oval in outline. The body of mandible was long, narrow and concave dorsomedially. The intermandibular space was "V" shaped. The process was large and its dorsal surface contained the extensive articular surfaces, which were convex. There was a shallow mandibular notch in middle of the medial surface of the ramus of mandible.

Two camelids were infected with c. tetani toxin and bacteria intramuscularly by Wernery et al., (2005). The camelids which were given the suspension in developed wry neck. The health deteriorated and were euthanized.

Wilson (2005) discussed the principles of early wound management. The wound healing can be positively influenced by dispensing appropriate treatment in the first few hours after injury. Positive actions in the early period include hemostasis, meticulous cleansing and debridement of the wound, the use of effective but nonirritating products to wound, closure (if indicated) with minimal tension on the suture line and the judicious use of drains.

El-Allawy et al., (2006) examined a total number of 2377 male and female camels of different ages were examined at different seasons from July 2003 to Dec 2004. The percentages of various infections were as follows: contagious skin necrosis (1.56%) and skin abscess (1.14%). The infections were observed to occur in camels between 9 – 10 years of age.

El-Meligy et al (2006) diagnosed 16 neoplastic growth in a herd of 350 male camels (one humped – Camelus dromedarius) from Sharkia and Ismalia governorates, Egypt. The affected anatomical regions were neck (6), shoulder (4), thigh (3), hump (2) and one pedunculated tumor was found between prepuce and scrotum. These neoplasms were surgically removed under local anaesthesia. The excision wound healed by first intention. The follow up observation did not reveal any recurrence or complications. The histopathological examination revealed that all were benign and classified as: papilloma (2), fibropapilloma (3), hard fibroma (F. durum) (8) and myxopapilloma (3). No tendency of metastasis was recorded.

Mohamed and Nouh (2006) recorded lesions and prevalence of skin affections in 1082 camels of different ages (2 – 10 years) and sexes were examined at Zagazig and Beldis abattoirs in Sharkia governorate and veterinary clinic of Zagazig University. Specimens and biopsies from the affected skin were subject to pustular, suppurative and ulcerative dermatitis in 12 camels (12.63%), popular dermatitis in 2 camels (2.10%), epidermoid cysts in 3 camels (3.15%), burns, traumatic injuries and scar formation in 50 camels (52.63%).

Al Sadi and Al Obidi (2006) reported a case of spontaneous sebaceous carcinoma of the eyelid in an adult male one-humped camel.
camels were given supportive treatment. Their mouths were washed with antiseptic solution, and Penstrep was administered at a dose of 20 ml for 7 days. An antihistaminic (Histamil) was also administered at a dose of 8 ml for 3 days. Most of the camels recovered within 2 weeks, whereas the more severely affected... 

Al-Hizab et al., (2007) reported basal cell carcinoma, also known as basal cell tumour, in a 10 years old she camel. It was developed in the maxillary region since last 1 year and it grew insidiously over the last 6 months. Clinical examination revealed a hard lobulated mass, extended from the facial crest to the canthus and covered with intact skin. The mandibular and parotid lymph nodes were slightly enlarged and there was a unilateral nasal discharge. The case was tentatively diagnosed as a tumour mass or abnormal tissue growth that required surgery. The animal was prepared for an aseptic surgery under local anaesthesia. It was first sedated with xylazine hydrochloride (Illium Xyline, Belgium) given at the dose of 0.2 mg/kg body weight. This was supplemented with a short period of anaesthesia using ketamine (body weight) given intravenously. The animal was then operated through an incision dorsal to the facial crest. During surgery, it was noticed that growth was composed of a well-circumscribed solitary lobulated fleshy mass confined to the dermis and subcutis. The posterior maxillary sinus was also involved. The abnormal growth was completely removed and the wound was properly sutured and dressed. Operation and neither complaints of postoperative complications nor recurrence of the growth were recorded thereafter.

Bengoumi et al., (2007) reported two kinds of cutaneous abscesses in camels, i.e. lymphadenitis and skin abscesses. Of all the cases observed, and affected especially camels less than 6 months old. The mortality was 18% of sick animals and it concern essentially generalised abscesses called locally “Douda”. *Staphylococcus aureus* was isolated in 91% of lymphadenitis cases and in 88% of skin necrosis cases. *Staphylococcus... gentamicin, tobramycin, florphenicol and marbofloxacin, slightly resistant to erythromycin, penicillin G, spiramycin and oxytetracycline. The treatment included a local drainage and disinfection. The use of injected antibiotics is highly recommended in generalised abscesses for infestation controls.

Gahlot et al., (2007a) studied the affection of head and neck region. The surgical affection recorded were mandibular fracture, laceration at commissure and nostril etc. and were treated with interdental wiring, reinforced brass rod interdental wiring, resection of soft palate, and commissural... 

Gahlot et al., (2007b) reported two male adult dromedary camels having a history of swelling on the lateral aspect of the neck on examination of swelling. Swelling was fluctuating in nature. Coffee coloured fluid was obtained on the exploratory puncture. These were diagnosed as sebaceous cysts. Surgical therapeutic management was done. Both the camels were sedated with xylazine. After aseptic preparations of site, the cyst were removed intact by giving ellipti... was apposed with horizontal mattress sutures and a bandage was applied as protective covering and a standard postoperative follow up included injection of oxytetracycline 1500 mg i.v., phenylbutazone 3000 mg i.v. and local application of fly repellant ointment was given to the animal. The sutures were removed on 12...
sinus/ fistula/ abscess (2.88%), gangrene (1.20%) and neoplasm (6.73%). In case of wounds, mainly the affections in nostrils, eyes and fibrosis with granulation tissue were also observed. Most common affections of eye were lacerations and wounds.

Aquino (2008) reported that eyelid fit and function are important for maintaining ocular surface health. Some common conditions that affect the eyelid include abnormal cilia, inappropriate eyelid conformation, eyelid trauma, and neoplasia. When these conditions are associated with discomfort and compromised corneal health, surgical intervention is indicated. The following article reviews common eyelid conditions and recommended surgical techniques for addressing these issues.

Brooks (2008) reported that corneal transplantation, amniotic membrane transplantation, phacoemulsification cataract extraction, and other ophthalmic surgical procedures in horses. The indications, techniques and postoperative complications of these and other ophthalmic procedures are discussed.

Meticulous and accurate anatomic repair can minimize postoperative complications to maintain positive visual outcomes in ophthalmic surgery.

Cho (2008) studied Orbital anatomy and the indications and surgical techniques for a variety of small animal orbital/globe surgical procedures. Common orbital surgical procedures, including ocular evisceration, intrascleral prosthesis implantation, enucleation, and proptosis repair, are discussed. Postoperative considerations for these procedures are also discussed with an emphasis on the practical aspects.

Mishra and Behi (2008) described that injury to facial nerve cause flaccid paralysis of the muscles of the affected side. In affected animals drooping of the ear and eyelid, drawing of the cheek towards the unaffected side and accumulation of the food in the unaffected side were the usual signs.

Chaudhary (2009) recorded bilateral mandibular fracture in 6 male camels. Bilateral mandibular fractures were recorded in age group of 5-10 years. Fractures were presented for surgical intervention in between 1-3 days after occurrence of fracture. In five camels fracture of mandible occurred due to fighting and one camel fractured attempting grip hook to cart. Examination of buccal cavity revealed bilateral mandibular fracture with downward deviation of anterior lower jaw. Site of fracture was near to tus (5 cases) and 1st premolar (1 case). Necrosis and foul smell were noticed in cases which were presented after 3 days of occurrence of fracture. Animals were restrained in sitting position, sedated with xylazine and resting of head over wooden table facilitated IM pinning for the repair of bilateral mandibular fracture. Retrograde pinning procedure was easier than normograde pinning. Normograde pinning was time consuming and misdirected seating into posterior fractured fragment. This resulted rigid immobilization at the site of fracture. Intramedullary pinning and interdental wiring performed in one camel also resulted satisfactory immobilization. Interdental wiring is rapid and easy to perform.

Zindoliya (2009) studied on surgical affection of skin in camel. Study was done in 151 cases of skin affections in camels of either sex and was divided into 5 groups. In group 1, surgical affections of skin of head and neck included buccal diverticulum (1), tumour at neck region (1), lacerated nostrils (5), avulsion of skin of nostril (3), and cutaneous ulceration (1). In group 2, surgical affections of skin of abdomen included skin dimpling (1) and sebaceous cyst (1). In group 3, surgical affections of skin of inguinal region included hidrosalpinx (1), neoplasm (1), and skin dimpling (1). In group 4, surgical affections of skin of thorax included skin dimpling (1), sebaceous cyst (1), and skin dimpling (1). In group 5, surgical affections of skin of back included skin dimpling (1).
surgical affections of skin in males and females 95.36 and 4.64%, respectively. Accordingly, the highest number of skin affections were of thorax and abdomen (32.45%); inguinal, scrotum, sheath and tail (14.56%) and limbs, and generalised skin affections (11.25%, each).

Molenaar et al., (2009) reported primary brain tumours were identified in two Bactrian camels (Camelus bactrianus) living at two zoos. Histology and immunohistochemistry were used to diagnose a histiocytic sarcoma in a 16-year-old female and a fibroblastic meningioma in the other. Both camels had shown progressive neurological signs, including circling and ataxia.

North and Banks (2009) discussed tumours of skin and subcutaneous tissues. Tumours of the skin and subcutaneous tissues can overlap: tumours of epithelial origin, round cell tumours, tumours of mesenchymal origin, tumours metastatic to skin. Generally, cutaneous tumours occur in older animals.

Long-term effects of sunlight result in solar dermatosis, leading to documented increases in cutaneous haemangioma, haemangiosarcoma. Mast cell tumours (MCT) are the most common skin tumour in small animals.

Al Sobayil and Mousa (2009) treated camels with deviation of neck and inability to stand. Clinical examination revealed elevation of heart and respiratory rates and congestion of eye mucous membrane. Treatment with B-complex and phenylbutazone (NSAID) was tried. However, all sick animals died within one week of admission.

Quazi (2010) treated the diverse musculo-skeletal affections on the general principle of management. All animals showing multiple treatments which included application of plaster of Paris cast using iron or wooden splint, inter-dental wiring using copper wire, operative procedures, wherever required and medicinal or surgicotherepeutic treatment. In animals of group 1, surgical affections of musculo-skeletal system of head and neck included mandibular fracture (14), torticollis (1), contusion at neck (1) and facial nerve paralysis (1).

Dioli (2010) reported 6 camels affected by wry neck syndrome in 6 camels. All the camels showed an S-shaped deviation of the neck with symptoms ranging from severe pain in the neck region affected by deviation and restriction of normal neck movement.

Kilic et al., (2010) reported a 15-year-old male dromedary camel with a history of chronic severe kerato-conjunctivitis and corneal mass in the left eye. Superficial keratectomy was performed and biopsy material submitted for histopathology. The diagnosis was corneal papilloma. There has been no recurrence of the neoplasm to date (6 months, 1 year). Corneal papilloma has not been reported previously in camels and seems to be associated with papillomavirus.

Ahmed (2011) reported the causes and classification of mandibular fractures in dromedary camels and outcome after treatment. Mandibular fractures in camels, which occurred more commonly in older males (P = .001) than in females. Open fractures were more common than closed fractures.
Purohit et al., (2011) reported a male camel aged 5 year with a history of continuous dribbling of saliva and escape of partially masticated right cheek since last 10 days following a traumatic injury by sharp object. The previously suture wound, however, dehisced. The camel became anorectic and had deteriorated general body condition. An escape of saliva through this opening led to wetting of hairs down below. Feed straw gradually lodged into the skin opening in form of a bunch examination revealed it as a case of buccal fistula. Surgically the buccal fistula was repaired under xylazine sedation. Postoperatively, checked and camel regained the appetite within a week. First intension healing was observed.

Singh et al., (2011) reported oesophageal obstruction in five adult camels. The camels were having difficulty in deglutition of feed. The camels reported that 3 camels were having habit of allotrophagia but the remaining 2 were having normal feeding habitits. The owner of the 2 allotrophagic camels reported that they have seen their camels engulfing iron objects used for ploughing purposes and these camels became off-feed. In 3 camels the swelling at the base of the neck and one of these had diffused type. These camels were examined by both plain and contrast radiography and ultrasonography. The causes of oesophageal obstruction were internal causes were choking due to dry roughages (2 cases) and metallic objects (2 cases). The external cause was peri-oesophageal abscess putting oesophagus. The ultrasonography of peri-oesophageal abscess showed hyperechoic mass in the centre surrounded by anechoic image of fluid. The abscess was drained managed in a routine manner. The internal causes of oesophageal obstruction were dry roughages and iron objects which were cleared by oesophagotomy. The post management for oesophagotomy was followed for 2 weeks. All camels responded well after oesophagotomy.

According to Siddiqui et al., (2012) mandibular fractures in camels are normally the result of camel bites and usually occur across the first premolars. Majority of these fractures are bilateral, compound and transverse in nature and can routinely be immobilized with the standard inter-dental wiring technique. The movement at the fracture site and ventral deviation of the cranial fracture fragment necessitating their repeated re-adjustment and repeated adjustment technique has proven quite useful to overcome this problem.

Ahmed and Al-SobayilL (2012) studied the frequencies and classification of fractures in young camels and evaluated the clinical relevance of treatment. Cases of fractures \( n = 75 \) in young camels (less than 2 years old) were studied. On admission, the cause, site, classification, and radiography of methods of treatment were investigated. Factors affecting fracture healing after treatment were investigated and analyzed. The frequencies of fracture were affected by breed \( P = 0.001 \) and age \( P = 0.01 \) but not sex. Trauma was the most common cause of fractures \( P = 0.001 \). Tibial fracture was the most common fracture of paris bandage alone (82.1%) or in combination with polyvinylchloride (PVC) splints (70.6%), interdental wiring (14.8%), or 2 Steinmann pins (1.9%). Satisfactory healing was recorded in 81.5% of the treated cases. In conclusion, breed and age affected the frequencies of fracture. There was a significant effect
Quazi and Gahlot (2012) reported 32 cases of musculo-skeletal affections of head, neck and thorax in camel. These were treated included application of plaster of Paris cast using iron or wooden splint, interdental wiring using copper wire, operative procedures, with therapeutic treatment. The occurrence of surgical affections of musculo-skeletal system of head/neck and thoracic region was 53.13%.
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<td>24</td>
<td>Photograph showing repaired lacerated eyelid in a camel.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Photograph showing unilateral laceration of nostrils (arrow) in a camel.</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Photograph showing healed wound of lacerated nostrils in a camel.</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>30</td>
<td>Photograph showing sutured cheek skin after surgical removal of tumor in a camel.</td>
<td>111</td>
</tr>
<tr>
<td>31</td>
<td>Micro photograph showing fibroma at cheek region in a camel.</td>
<td>112</td>
</tr>
<tr>
<td>32</td>
<td>Photograph showing tumour in oral cavity in a camel (arrows).</td>
<td>112</td>
</tr>
<tr>
<td>33</td>
<td>Photograph showing the site after removal of tumor in a camel.</td>
<td>113</td>
</tr>
<tr>
<td>34</td>
<td>Micro photograph showing fibroma in oral cavity in a camel.</td>
<td>113</td>
</tr>
<tr>
<td>35</td>
<td>Photograph showing large haemorrhagic wound above nose with a loss of skin in camel.</td>
<td>114</td>
</tr>
<tr>
<td>36</td>
<td>Photograph showing wound at head region in a camel (arrows).</td>
<td>114</td>
</tr>
<tr>
<td>37</td>
<td>Photograph of torticollis showing S-shaped curvature of neck in a camel calf.</td>
<td>115</td>
</tr>
<tr>
<td>38</td>
<td>Photograph showing supportive bandage with splint to correct curvature in torticollis in a camel calf.</td>
<td>115</td>
</tr>
<tr>
<td>39</td>
<td>Photograph showing dermoid cysts on proximal part of the neck region in vicinity of jugular vein in a camel</td>
<td>116</td>
</tr>
<tr>
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<td></td>
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<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Photograph showing abrasion wounds (arrows) on ventral aspect of neck region in a camel.</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Photograph of chronic abscess on ventral aspect of the base of neck region in a camel.</td>
<td></td>
</tr>
</tbody>
</table>
RESULTS

The results of the present study have been described as follows:

1. Diagnosis.
2. Incidence/occurrence of the affections.
3. Treatment.
4. Retrospective study for last ten years (2001-2010).
5. Analysis of result

1. Diagnosis

Surgical affections of head and neck region recorded in the present study were diagnosed on the basis of history, clinical examination and radiological examination whenever required. The nature of lesion was evaluated on the basis of its clinical signs such as swelling (Abscess, tumors etc.), inflammation, suppuration, necrosis etc. Exploratory puncture was done as and where required in case of swelling. Chronicity of lesion was determined by history and previous treatment given.

One hundred thirty eight surgical affections were diagnosed in camels in the present study. Out of which mandible fracture cases were maximum (43) followed by lacerated nostril (10), corneal opacity (9),
The diagnosis of individual surgical affections of head and neck region of the present study are as given below.

**Surgical affections of head region**

**a) Mandibular Fracture**

Mandibular fracture was recorded in 43 camels out of which 2 were female camels. The majority of cases had a history of fighting with another camel during rut season, whereas few had a history of accidental trauma. The fractured lower jaw or mandible showed downward inclination cranial to the fracture site, thus making lips apart (Fig. 1). Animals were neither able to eat nor drink. There was drooling of saliva which was blood tinged in fresh cases. In some cases profuse bleeding or haematoma was observed at the site of fracture due to disruption of gingiva. The fracture was diagnosed on the basis of clinical signs and the extent of fracture was assessed by a lateral radiograph (Fig. 2). Mandibular fracture occurs across the first premolars or quite cranial or caudal to this point in interdental space.

**b) Soft Palate Injury**

The soft palate injury was recorded in 5 male camels during breeding season. It got injured either with its own teeth or by biting of offender camel or external trauma. The injured soft palate showed...
In male camels, incidence was of dermoid cyst 4 (2.89%), followed by tumor (1.44%), contusion and abrasion at neck region 2 (1.44%), torticollis 1 (0.72%), and abrasion at neck 1 (0.72%).

The incidence of surgical affections of the head region in male and female camels was 106 (76.81%) and 17 (12.31%), respectively. The incidence of surgical affections of the neck region was 11 (7.97%) and 4 (2.89%), respectively. The overall occurrence of diverse surgical affections in male and female camels was 106 (87.60%) and 15 (12.39%), respectively (Table 2 & graph 3).

C. Classification according to season

i. Summer
ii. Winter
iii. Rainy

The incidence of surgical affections of the head region recorded in the summer, winter, and rainy seasons were 50 (33.97%), 22 (15.94%), and 34 (25.54%), respectively. The incidence of surgical affections of the head region recorded in the summer, winter, and rainy seasons were 50 (33.97%), 22 (15.94%), and 34 (25.54%), respectively. The incidence of surgical affections of the head region recorded in the summer, winter, and rainy seasons were 50 (33.97%), 22 (15.94%), and 34 (25.54%), respectively (Table 2 & graph 3).
### Table 2: Sex-wise distribution of surgical affections in camels in present study.

<table>
<thead>
<tr>
<th>Region</th>
<th>Type of surgical affections</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>Head</td>
<td>Mandible fracture</td>
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<td>29.71</td>
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<td>43</td>
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<td></td>
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<td>5.07</td>
<td>1</td>
<td>0.72</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Soft palate injury</td>
<td>5</td>
<td>3.62</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Buccal fistula</td>
<td>3</td>
<td>2.17</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td></td>
<td>Salivary fistula</td>
<td>3</td>
<td>2.17</td>
<td>2</td>
<td>1.44</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Oral tumour</td>
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<td>0.72</td>
<td>-</td>
<td>-</td>
<td>1</td>
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<tr>
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<td>Cheek Tumour</td>
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<td>0.72</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Gingivitis</td>
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<td>0.72</td>
<td>3</td>
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<tr>
<td></td>
<td>Lacerated nostrils</td>
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<td>10</td>
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<tr>
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<td>4.34</td>
<td>1</td>
<td>0.72</td>
<td>7</td>
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<tr>
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<td>0.72</td>
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<td>17</td>
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<td>1</td>
<td>0.72</td>
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</table>
Graph 3: Sex-wise distribution of surgical affections in present study.

- Male: 84.78%
- Female: 15.21%
Table 3: Season-wise distribution of surgical affections in camels in present study.

<table>
<thead>
<tr>
<th>Region</th>
<th>Type of surgical affections</th>
<th>Summer</th>
<th>%</th>
<th>Winter</th>
<th>%</th>
<th>Rainy</th>
<th>%</th>
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<td>2.17</td>
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<td>1.44</td>
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<td>3.62</td>
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<td>1.44</td>
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<td>Keratitis</td>
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<tr>
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<td>0.72</td>
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<td>1.44</td>
<td>-</td>
<td>-</td>
<td>3</td>
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</tr>
<tr>
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<td>0.72</td>
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<td>0.72</td>
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<td><strong>Total</strong></td>
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<td>5.07</td>
<td>3</td>
<td>2.17</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>
D. Classification according to age

i. Below 3 years
ii. 3-6 years
iii. 6-9 years
iv. Above 9 years

The incidence recorded in the age group above 9 years of camels were 3 (2.17%), 15 (31.88%) respectively.

The incidence of surgical affections recorded in the age groups above 9 years of camels were 3 (2.17%), 1 (0.72%), 6 (4.34%), and 5 (3.62%) respectively.

The overall occurrence of surgical affections was found to be highest in 6-9 years age group 49 (35.50%) years age group 6 (4.34%)

Graph 4: Season-wise distribution of surgical affections in present study.
Table 4: Age-wise distribution of surgical affections in camels in present study.

<table>
<thead>
<tr>
<th>Region</th>
<th>Type of surgical affections</th>
<th>Age (in Years)</th>
<th>below 3</th>
<th>%</th>
<th>3-6</th>
<th>6-9</th>
<th>%</th>
<th>Above 9</th>
<th>%</th>
</tr>
</thead>
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<tr>
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</tr>
<tr>
<td><strong>Ax</strong></td>
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<td>Fibrous enlargement/fibroma of chest pad</td>
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<td>0.82</td>
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<tr>
<td></td>
<td>Preputial proplase</td>
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<td>-</td>
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<td>Tumor at ischiorectal fossa</td>
<td></td>
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<tr>
<td></td>
<td>Tumor at gluteal region</td>
<td></td>
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<td>-1</td>
<td>1</td>
<td>0.82</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Wound at gluteal region</td>
<td></td>
<td>-</td>
<td>-1</td>
<td>1</td>
<td>0.82</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td></td>
<td>Perianal wound</td>
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<td>1</td>
<td>0.82</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td></td>
<td>Abrasion at sacrum</td>
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<td>-</td>
<td>-1</td>
<td>1</td>
<td>0.82</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Wound at udder</td>
<td></td>
<td>-</td>
<td>-1</td>
<td>1</td>
<td>0.82</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Urine retention</td>
<td></td>
<td>1</td>
<td>0.82</td>
<td>1</td>
<td>0.82</td>
<td>1</td>
<td>0.82</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>1</td>
<td>0.82</td>
<td>13</td>
<td>10.74</td>
<td>6</td>
<td>4.95</td>
<td>2</td>
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<tr>
<td><strong>Tail</strong></td>
<td>Gangrene</td>
<td></td>
<td>-</td>
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<td>5</td>
<td>4.13</td>
<td>3</td>
<td>2.47</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Wound at tail</td>
<td></td>
<td>-</td>
<td>-1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.82</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>-</td>
<td>-1</td>
<td>5</td>
<td>4.13</td>
<td>4</td>
<td>3.30</td>
<td>2</td>
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</tbody>
</table>
Graph 5: Age-wise distribution of surgical affections in camels in present study.
B. TREATMENTS

The surgical treatments given to the animals of the present study are described below group wise. Majority of camels was secured with surgical affections of head and neck region.

ropes either in sternal or lateral recumbency. Aseptic preparation of the site was done by clipping, shaving and scrubbing the area with savlon or dettol soap. The area was later painted with 5% povidone iodine solution. The surgical procedure was carried out under xylazine sedation @ 0.3 mg/kg body weight.

Surgical affections of head region

a) Mandibular Fracture

Mandible fracture was treated by Interdental wiring (IDW) technique by Gahlot et al (1984) and Gahlot (2000). Animals were kept off feed and water 24 hours, preoperatively. It was secured in sternal recumbency and sedated with xylazine @ 0.3 mg per kg, intravenously. A hand drill loaded with 2 mm trocar type intramedullary pin was used to drill a tunnel between gingiva of first two cheek tooth on either side. A 2 mm thick copper wire was passed through these tunnels on either side and medial ends of the wires were taken out between the spaces at central incisors. In 5 cases, the space was too small to pass the wires, hence a tunnel was created by using the hand drill loaded with 2 mm trocar type intramedullary pin. A traction was applied on anterior fragment of fracture by means of hand drill and reduce the fracture. It was followed by pulling the mandible and suturing the soft tissue with 3.0 nylon suture.

A detailed retrospective study for last ten years (2001-2010) surgical affections of head and neck region described as:

A. Region wise study

The number of diverse surgical affections of head and neck region recorded in camels enlisted in table 5.

In the head region maximum affections recorded were mandible fracture 213 (23.40%) followed by wound at head region 98 (10.76%), maggot wound at nostrils 97 (10.65%), lacerated nostril 85 (9.34%), corneal opacity 67 (7.36%), submandibular abscess 65 (7.14%), salivary fistula 48 (5.27%), eyelid laceration 43 (4.72%), buccal fistula 33 (3.62%), soft palate injury 28 (3.07%), eye injury 26 (2.85%), lacrimal 23 (2.52%), conjunctivitis 19 (2.08%), xerophthalmia 7 (0.76%), facial nerve paralysis 6 (0.65%), ruptured eyeball 6 (0.65%), keratoconjunctivitis 4 (0.43%), keratitis 3 (0.32%), descemetocele 1 (0.10%), subconjunctival haemorrhage 1 (0.10%).

In the neck region maximum affections recorded were neck injury 9 (0.98%) followed by torticollis 8 (0.87%), tumor at throat 6 (0.65%), dermoid cyst 5 (0.54%), oesophageal abscess 2 (0.21%).
### Table 5: Region-wise distribution of surgical affections in camels retrospective study.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Region</th>
<th>Type of surgical affections</th>
<th>Total</th>
<th>Incidence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Head</td>
<td>Mandible fracture</td>
<td>213</td>
<td>23.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Submandibular abscess</td>
<td>65</td>
<td>7.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soft palate injury</td>
<td>28</td>
<td>3.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buccal fistula</td>
<td>33</td>
<td>3.62</td>
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<tr>
<td></td>
<td></td>
<td>Salivary fistula</td>
<td>48</td>
<td>5.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facial nerve paralysis</td>
<td>6</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wound at head region</td>
<td>98</td>
<td>10.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lacerated nostril</td>
<td>85</td>
<td>9.34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maggot wound at nostril</td>
<td>97</td>
<td>10.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eye lids laceration</td>
<td>43</td>
<td>4.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ruptured eyeball</td>
<td>6</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lacrymal discharge of eye</td>
<td>23</td>
<td>2.52</td>
</tr>
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<td></td>
<td></td>
<td>Eye Injury</td>
<td>26</td>
<td>2.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conjunctivitis</td>
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<td>2.08</td>
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<td></td>
<td></td>
<td>Kerato-conjunctivitis</td>
<td>4</td>
<td>0.43</td>
</tr>
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<td></td>
<td></td>
<td>Keratitis</td>
<td>3</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corneal Opacity</td>
<td>67</td>
<td>7.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Xerophthalmia</td>
<td>7</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prolapse of third eyelid</td>
<td>5</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Descemetocele</td>
<td>1</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subconjunctival haemorrhage</td>
<td>1</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>878</td>
<td>96.48</td>
</tr>
<tr>
<td>2</td>
<td>Neck</td>
<td>Poll gland abscess</td>
<td>2</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dermoid cyst</td>
<td>5</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Torticollis</td>
<td>8</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neck injury</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>
B. Sex wise study

The number of surgical affections to sex in camels enlisted in

The incidence of mandible fracture 81 (8.90%), wound at nostrils 52 (5.71%), submandibular abscess 36 (4.05%), eyelid laceration 26 (2.91%), palate injury 28 (3.07%), eye injury 22 (2.41%), conjunctivitis 20 (2.20%), ruptured eyeball 5 (0.54%), neck injury 5 (0.54%), poll gland abscess 2 (0.21%), keratitis 2 (0.21%), subconjunctival haemorrhage 1 (0.10%), oesophageal obstruction 1 (0.10%).

The incidence of maggot wound at nostril 15 (1.64%), lacerated nostril 11 (1.20%), wound at head region 9 (0.98%), mandible fracture 7 (0.76%), salivary fistula 7 (0.76%), submandibular abscess 6 (0.65%), conjunctivitis 6 (0.65%).
Table 6: Sex-wise distribution of surgical affections in camels in retrospective study.

<table>
<thead>
<tr>
<th>Type of surgical affections</th>
<th>No. of cases</th>
<th>Male</th>
<th>Incidence (%)</th>
<th>Female</th>
<th>Incidence (%)</th>
<th>Total</th>
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<td>0.76</td>
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<td>213</td>
</tr>
<tr>
<td>Submandibular abscess</td>
<td>59</td>
<td>6.48</td>
<td>6</td>
<td>0.65</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>Soft palate injury</td>
<td>28</td>
<td>3.07</td>
<td>-</td>
<td>-</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>Buccal fistula</td>
<td>31</td>
<td>3.40</td>
<td>2</td>
<td>0.21</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>Salivary fistula</td>
<td>41</td>
<td>4.50</td>
<td>7</td>
<td>0.76</td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Facial nerve paralysis</td>
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<td>0.65</td>
<td>-</td>
<td>-</td>
<td></td>
<td>6</td>
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<tr>
<td>Wound at head region</td>
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<td>9.78</td>
<td>9</td>
<td>0.98</td>
<td></td>
<td>98</td>
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<td>Lacerated nostril</td>
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<td>8.13</td>
<td>11</td>
<td>1.20</td>
<td></td>
<td>85</td>
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<tr>
<td>Maggot wound at nostril</td>
<td>81</td>
<td>8.90</td>
<td>16</td>
<td>1.75</td>
<td></td>
<td>97</td>
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<tr>
<td>Eye lids laceration</td>
<td>38</td>
<td>4.17</td>
<td>5</td>
<td>0.54</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td>Ruptured eyeball</td>
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<td>0.54</td>
<td>1</td>
<td>0.10</td>
<td></td>
<td>6</td>
</tr>
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<td>Lacrymal discharge of eye</td>
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<td>2.41</td>
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<td>0.10</td>
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<td>23</td>
</tr>
<tr>
<td>Eye Injury</td>
<td>21</td>
<td>2.30</td>
<td>5</td>
<td>0.54</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>13</td>
<td>1.42</td>
<td>6</td>
<td>0.65</td>
<td></td>
<td>19</td>
</tr>
<tr>
<td>Kerato-conjunctivitis</td>
<td>1</td>
<td>0.10</td>
<td>3</td>
<td>0.32</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Keratitis</td>
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<td>0.21</td>
<td>1</td>
<td>0.10</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Corneal Opacity</td>
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<td>5.71</td>
<td>15</td>
<td>1.64</td>
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<td>67</td>
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</tbody>
</table>

Out of 910 cases recorded, 7 (12.19%) were females (graph 7).

C. Season wise study

The number of diverse surgical affections to season in camels enlisted in

In the summer season maximum affections recorded were mandible fracture 37 (4.06%), lacerated nostril 37 (3.51%), lacerated nostril 28 (3.07%), salivary fistula 14 (1.53%), lacrimal discharge of eye 9 (0.98%), eye injury 9 (0.98%), conjunctivitis 6 (0.65%), x-torticollis 3 (0.32%), facial nerve paralysis 2 (0.21%), prolapse of third eyelid at throat 2 (0.21%), ruptured eyeball 1 (0.10%), oesophageal obstruction 1 (0.10%).

In the winter season maximum affections recorded were mandible fracture 147 (16.15%) followed by lacerated nostril 37 (4.06%), lacerated nostril 28 (3.07%), salivary fistula 28 (3.18%), corneal opacity 21 (2.30%), buccal fistula 14 (1.53%), salivary fistula 14 (1.42%), lacrimal discharge of eye 9 (0.98%), eye injury 9 (0.98%), conjunctivitis 6 (0.65%), x-torticollis 3 (0.32%), prolapse of third eyelid at throat 2 (0.21%), ruptured eyeball 1 (0.10%), oesophageal obstruction 1 (0.10%).
Graph 7: Sex-wise distribution of surgical affections in camels in retrospective study
Table 7: Season-wise distribution of surgical affections in camels in retrospective study

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Type of surgical affections</th>
<th>Season</th>
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<th></th>
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<tr>
<td></td>
<td></td>
<td>Summer</td>
<td>Winter</td>
<td>Rainy</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1</td>
<td>Mandible fracture</td>
<td>37</td>
<td>4.06%</td>
<td>147</td>
<td>16.15%</td>
<td>29</td>
<td>3.18%</td>
<td>213</td>
</tr>
<tr>
<td>2</td>
<td>Submandibular abscess</td>
<td>21</td>
<td>2.30%</td>
<td>27</td>
<td>2.96%</td>
<td>17</td>
<td>1.86%</td>
<td>65</td>
</tr>
<tr>
<td>3</td>
<td>Soft palate injury</td>
<td>-</td>
<td>28</td>
<td>3.07%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>28</td>
</tr>
<tr>
<td>4</td>
<td>Buccal fistula</td>
<td>14</td>
<td>1.53%</td>
<td>13</td>
<td>1.42%</td>
<td>6</td>
<td>0.65%</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>Salivary fistula</td>
<td>13</td>
<td>1.42%</td>
<td>28</td>
<td>3.07%</td>
<td>7</td>
<td>0.76%</td>
<td>48</td>
</tr>
<tr>
<td>6</td>
<td>Facial nerve paralysis</td>
<td>2</td>
<td>0.21%</td>
<td>3</td>
<td>0.32%</td>
<td>1</td>
<td>0.10%</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Wound at head region</td>
<td>32</td>
<td>3.51%</td>
<td>45</td>
<td>4.94%</td>
<td>21</td>
<td>2.30%</td>
<td>98</td>
</tr>
<tr>
<td>8</td>
<td>Lacerated nostril</td>
<td>31</td>
<td>3.40%</td>
<td>37</td>
<td>4.06%</td>
<td>17</td>
<td>1.86%</td>
<td>85</td>
</tr>
<tr>
<td>9</td>
<td>Maggot wound at nostril</td>
<td>29</td>
<td>3.18%</td>
<td>26</td>
<td>2.85%</td>
<td>42</td>
<td>4.61%</td>
<td>97</td>
</tr>
<tr>
<td>10</td>
<td>Eye lids laceration</td>
<td>13</td>
<td>1.42%</td>
<td>21</td>
<td>2.30%</td>
<td>9</td>
<td>0.98%</td>
<td>43</td>
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<tr>
<td>11</td>
<td>Ruptured eyeball</td>
<td>1</td>
<td>0.10%</td>
<td>4</td>
<td>0.43%</td>
<td>1</td>
<td>0.10%</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>Lacrimal discharge of eye</td>
<td>9</td>
<td>0.98%</td>
<td>7</td>
<td>0.76%</td>
<td>7</td>
<td>0.76%</td>
<td>23</td>
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<tr>
<td>13</td>
<td>Eye Injury</td>
<td>9</td>
<td>0.98%</td>
<td>10</td>
<td>1.09%</td>
<td>7</td>
<td>0.76%</td>
<td>26</td>
</tr>
<tr>
<td>14</td>
<td>Conjunctivitis</td>
<td>6</td>
<td>0.65%</td>
<td>10</td>
<td>1.09%</td>
<td>3</td>
<td>0.32%</td>
<td>19</td>
</tr>
<tr>
<td>15</td>
<td>Kerato-conjunctivitis</td>
<td>1</td>
<td>0.10%</td>
<td>3</td>
<td>0.32%</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>Keratitis</td>
<td>2</td>
<td>0.21%</td>
<td>1</td>
<td>0.10%</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>Corneal Opacity</td>
<td>21</td>
<td>2.30%</td>
<td>37</td>
<td>4.06%</td>
<td>9</td>
<td>0.98%</td>
<td>67</td>
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<tr>
<td>18</td>
<td>Xerophthalmia</td>
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<td>0.43%</td>
<td>3</td>
<td>0.32%</td>
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<td>7</td>
</tr>
<tr>
<td>19</td>
<td>Descemetocele</td>
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<td>-</td>
<td>1</td>
<td>0.10%</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

descemetocele 1 (0.10%), oesophageal obstruction 1

In the rainy season maximum affections recorded were maggot wound at nostrils 42 (4.61%), wound at head region submandibular abscess laceration 9 (0.98%), salivary fistula lacrimal discharge of eye 7 (0.76%), neck injury ruptured eyeball 1 (0.10%).

The overall occurrence of surgical affections was found to be highest winter season 472 rainy 179 (19.67%) respectively.

D. Year wise study

In the present retrospective study between years 2001-2010 are enlisted year wise.

An overview of ten year’s retrospective study revealed that there was maximum occurrence wound at head region (10.65%), lacerated nostril

Graph 8: Season-wise distribution of surgical affections in camels in retrospective study.

- Summer: 28.46%
- Winter: 51.86%
- Rainy: 19.67%
Table 8: Year-wise distribution of surgical affections in retrospective study.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Type of surgical affections</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
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5 (0.54%), dermoid cyst 5 (0.54%), keratoconjunctivitis 4 (0.43%), keratitis 3 (0.32%), Poll gland abscess 2 (0.21%), oesophageal obstruction 2 (0.21%), descemetocele 1 (0.10%), subconjunctival haemorrhage 1 (0.10%).

The incidence of congenital affections were 2 (0.21%) and acquired affections were 908 (99.78%). Descemetocele 1 (0.10%) and subconjunctival haemorrhage 1 (0.10%) affections in congenital category was recorded.

An overview of ten year's retrospective study revealed that there was a maximum occurrence in the year 2001 (13.40%) followed by year's 2002 (11.75%), 2003 (11.75%), 2005 (10.65%), 2004 (9.78%), 2006 (9.45%) 2008 (9.01%), 2009 (8.57%), 2007 (8.02%), and 2010 (7.58%) (graph 9).
E. Analysis of results

The analysis of results has been described under two subheadings:

1. Present study
2. Retrospective study

1. Present study

An overview of the present study revealed that there was a maximum occurrence of mandible fracture (31.15%) followed by lacerated nostril (7.24%), corneal opacity (6.52%), submandibular abscess (5.79%), eyelid laceration (5.07%), conjunctivitis (5.07%), soft palate injury (3.62%) and remaining affections in declining order. Mandible fracture occurs due to fighting with another camel during the rut season due to vicious behaviour of camel or accidental trauma. Laceration of nostril occurred due to pulling of nose halters attached to the nose pegs in untrained camels. External trauma caused corneal opacity of mild, moderate or severe forms in camels. Blunt trauma or foreign body caused submandibular abscess. Laceration of the eyelid was hooking of the eyelid or its edges with sharp objects or fixtures like hooks, nails etc., of the camel cart during involuntary rubbing of the facial region by the camel. Continuous irritation or inflammation of the eye caused the conjunctivitis.
Table 9: Clinical healing time and treatments adopted for surgical affections of various regions.

<table>
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<th>Surgical affections</th>
<th>Treatments adopted</th>
<th>Clinical Healing Time</th>
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<td>Mandible fracture</td>
<td>IDW, Irrigation (Potassium Permanganate Solution), Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Meloxicam), Powder Chelated Agrimin Forte.</td>
<td>30-60 days or even more</td>
</tr>
<tr>
<td>Soft palate injury</td>
<td>Surgical resection, Irrigation (Potassium Permanganate Solution), Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Meloxicam).</td>
<td>3-5 days</td>
</tr>
<tr>
<td>Bucal fistula</td>
<td>Surgically repaired, Irrigation (Potassium Permanganate Solution), Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Meloxicam)</td>
<td>3-5 weeks</td>
</tr>
<tr>
<td>Salivary fistula</td>
<td>Surgically repaired, Irrigation (Potassium Permanganate Solution), Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Phenylbutazone)</td>
<td>15-20 weeks</td>
</tr>
<tr>
<td>Oral tumour</td>
<td>Surgical excision, Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Meloxicam)</td>
<td>14 days</td>
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<tr>
<td>Cheek tumour</td>
<td>Surgical excision, Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Meloxicam)</td>
<td>15 days</td>
</tr>
<tr>
<td>Gingivitis</td>
<td>Irrigation (Potassium Permanganate Solution), Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Meloxicam)</td>
<td>10-15 days</td>
</tr>
<tr>
<td>Lacerated nostrils</td>
<td>Surgically repaired, Irrigation (Potassium Permanganate Solution), Broad Spectrum Antibiotic (Oxytetracycline), Non Steroidal Anti Inflammatory Drug (Phenylbutazone)</td>
<td>15-30 days</td>
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</table>
Healing of mandible fracture took place in 30 to 45 days or even more because of mal union and movement of the lower jow. Healing of lacerated nostril, lacerated eyelid, corneal ulcer and corneal opacity, abscesses at neck, submandibular abscesses, wounds of nostril took place in 30 to 90 days. However, longest healing time observed was in cases of severe corneal opacity.

Healing of superficial wounds like abrasion wound, contusions, laceration wounds took place in 12-18 days following an appropriate debridement and dressing.

Open wound needed debridement and irrigation with light potassium permanganate solution and dressing with either a topical ointment or spray. In all cases broad spectrum antibiotics and nonsteroidal anti-inflammatory drugs were given.

2. Retrospective study

An overview of ten years retrospective study revealed that there was a maximum occurrence of mandible fracture fracture 213 (23.40%) followed by wound at head region 98 (10.76%), maggot wound at nostrils 97 (10.65%), lacerated nostril 85 (9.34%), corneal opacity 67 (7.36%), submandibular abscess 65 (7.14%), salivary fistula 48 (5.27%), eyelid laceration 43 (4.72%), soft palate injury 28 (3.07%) and remaining affections in declining order. Mandible fracture occurs due to fighting with another camel during rut season or accidental trauma.