Management of surgical affections in captive elephants

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During the last 25 years, large numbers of surgical conditions were attended in captive elephants in Kerala. Most of the conditions were comparable to similar affections observed in other domestic animals. However, management of the conditions for correcting the injury and to promote healing, demanded special attention. Owing to the delay in the healing of wounds, treatment/ attention had to be continued for periods much longer than in other domestic animals. Though the response to the drugs/ medicines used was satisfactory, large quantity needed per dose made it a costly treatment.

Anaesthesia for surgery

Anaesthesia was employed in all cases where the manipulations were painful, needed extensive and time-consuming dissection in the regions like the trunk and limbs. Agents like chloral hydrate and thiopentone have been tried but because of poor analgesia and the risk involved with such drugs, they are not being used now. The drugs used and their doses are:

1. Xylazine 0.1 to 0.11 mg / kg 1M
2. Acepromazine 0.1 mg / kg 1M
3. Ketamine 5-10 mg / kg 1M
4. Etorphine 1 mg / 1000 kg 1M

Combinations of drugs can be used *viz:* Xylazine - Acepromazine, Xylazine - Ketamine, Etorphine - Acepromazine and the dose of individual drugs can be reduced up to 50% when combinations are used. When animals are to be secured in standing position Xylazine or its combinations are used. If the animals are to be secured in recumbency Xylazine or Etorphine and combinations are used. Xylazine and itscombinations are used in captive elephants and the signs of anaesthesia are:

(i) Relaxation in trunk, tail and ear

(ii) Snoring sounds are produced when depression is deep

(iii) Profuse lachrimation and salivation

(iv) Protrusion of penis.

Induction will be complete in 20 minutes after administration and the anaesthetic affect lasts for 40 - 60 minutes after a single dose. Recovery will be smooth and takes 4 - 6 hours. When anaesthesia is to be prolonged subsequent doses will have to be administered - usually half the dose of what was used initially.

Etorphine is usually employed for capturing wild animals. The induction will be fast (5-8 minutes) and anaesthesia lasts for 1-2 hours.

Since xylazine is a potent analgesic, surgical manipulations can be carried out painless.

Local anaesthesia with infiltration or nerve block is rarely attempted in elephants because of the difficulty in administration and the large volume required for infiltration. Moreover, local anaesthesia does not in any way aid in controlling the animal.

Surgical Conditions:

1. Wounds:

Closed and open wounds have been treated.

a. Closed Wounds:

Caused by falls, heavy falling objects, automobile pressure at bony prominence and tusker charging by other elephants.

In all cases, the wounds were with extensive subcutaneous crush injury with formation of haematoma. Haematomas formed at bony

prominences like external angle of ileum progressively get enlarged and spread to adjoining parts.

Initially the haematoma is non inflammatory but develop inflammation later

as part of the healing process. Infection may lead on to formation of abscess.

b. Open wounds:

All categories of open wounds were attended to in elephants - animal inflicted, man made and accidental. Animal inflicted injuries were penetrating and lacerated wounds. Man made wounds were incised, punctured and bullet wounds. Wounds developed from pressure of the tethering chain, ropes and controlling equipment were also open wounds. Complications like maggot infestation, cellulitis and gangrenous changes were also observed.

Open wounds were invariably contaminated and many a times septic.

Treatment:

a. Closed wounds:

Haematomas formed at the site of injury were treated as closed wounds on the following lines:

(i) Topical application of thrombophob / hirudoid ointment when haematomas were small

(ii) In large haematomas, counter irritants like iodine ointment or Aloes in egg white paste

(iii) Oral administration of Chimeral forte to promote absorption

(iv) Oral administration of Potassium iodide at the rate of 25 g daily for 1 week; as resolvant

(v) Oral administration of Aspirin tabs, diuretics, antihistaminics

(vi) Parenteral administration of antibiotics

(vii) Rest

b. Open wounds:

(i) Wounds were cleaned with soap and water or antiseptics like Savlon / Dettol solution

(ii) Bleeding points were controlled with ligature/ forceps/styptics

(iii) Removed debris /freshened the wounds and sutured when wounds are fresh or when they are extensive

(iv) Tetanus toxoid (5-10 ml) was administered

(v) Contaminated or septic wounds were dressed with antiseptics/antibiotics

(vi) Magsulph glycerine paste was applied when there was oedema /too much of dead tissue

(vii) Depending on extent of infection, parenteral administration of antibiotics (Penicillin and Streptomycin/ Metrodinazole/ Tetracyclin/ ampicillin/ Chloromycetin)

(viii)In deep penetrating wounds, provision for drainage was provided

(ix) Rest

Wounds on the trunk and abdomen are discussed separately.

2. Abscess:

Abscesses were observed in all parts of the body in elephants. They were seen developing from

(i) secondary contamination of haematoma

(ii) secondary to penetrating wounds and

(iii) iatrogenic infection.

Latent period of development of abscess varies from weeks to months. Development of abscess and maturation are like in other animals.

Treatment:

(i) Hastening maturation using counter irritants like iodine ointment

(ii) Opening and draining contents and treating it as open wounds

3. Sinuses:

Sinuses noticed in elephants were usually the result of open abscess / wounds with incomplete drainage. Presence of foreign bodies like bullets and sequestered bone also cause development of inflammatory tracts, which did not show any tendency to heal. Sinuses were often noticed at external angle of ileum, point of elbow and at elbow.

The sinus tracts were unusually indurated and hard and showed poor granulation.

Treatment:

Providing drainage and removal of foreign bodies along with cauterisation and removal of fibrous tissue. Repeated application of triple Sulphate (Equal parts of copper sulphate, zinc sulphate and ferrous sulphate) was effective in removing fibrous tissue and promoting granulation. Surgical resection of the sinus tract may also be performed.

4. Cyst:

Cysts were noticed at the point of elbow, developed probably due to repeated initiation in lying down and getting up - similar to capped elbows in other animals. Hyperkeratinisation of the skin with injury, pain when inflamed and size interfered with the use of the limb and lameness.

Treatment:

After confirming with exploratory puncture, it is treated by drainage, destruction of capsule and promoting granulation.

discharge. Work or walking increased the quantum of discharge which was offensive smelling.

It responds to antibiotic therapy. Broad-spectrum penicillin, ciprofloxacin, rifamycin, INH and vitamins and minerals were found to reduce the discharge. The treatment had to be continued for 3-6 months.

10. Temporal adenitis:

Hypertrophy of the temporal glands and secretion from it is noticed during musth. The gland during this period may get injured or infected resulting in temporal adenitis. Retention of secretions may also cause adenitis.

Two types of lesions have been observed.

(i) Chronic adenitis resulting in thickening and enlargement of the gland and supporting tissue.

(ii) Purulent adenitis with discharge of pus through the temporal dust orifice.

In chronic adenitis, the gland becomes swollen, hard and painful. The gland and adjacent tissues become indurated and hard. It may get injured resulting in recurrent inflammation at the temporal region. The gland does not show discharge during musth but it may become oedematous.

In purulent form, the gland becomes woollen, oedematous and pus may be discharged through the orifice. The swelling will be tender and painful. It subsequently behaves like an abscess, point and burst. Owing to irritation, the animal may try to rub or scratch the temporal region and the skin may get injured.

Recurrent injury to the swollen gland is possible when the animal lies down and gets up.

Treatment:

(i) In the chronic form, counter irritants can be applied to resolve the adenitis.

(ii) In recurrent inflammation, anti-inflammatory drugs may be administered orally and parenteraly.

(iii) The indurated gland may be surgically removed under general anaesthesia.

(iv) Opening the swelling and cauterising the gland with caustics like triple sulphate.

(v) Purulent form may be opened and drained and treated as open wound.

11. Broken Tusk:

Tusk gets broken in:

(i) automobile accidents

(ii) fall from a height and

(iii) charging against hard objects.

The break may be at any part of the exposed tusk with or without exposing the pulp. When the pulp is exposed, it bleeds profusely. The animal shows signs of severe pain.

This may be treated by trimming the broken end and dressing with tincture benzoin. The wound may be sealed with wax. Repeated antiseptic dressing and use of a metal cap would aid recovery.

12. Split Tusk:

The tusk may develop crack or split longitudinally at any part of the exposed portion. The split may extend to the pulp where in it gets infected and cause decay of the pulp. Serous or serosanguenous discharge may be noticed from the split. When the pulp undergoes decay, the tusk may become loose and shaky.

13. Exposure and Decay of Tusk Pulp:

The pulp of the tusk gets exposed when the tusk is broken, split or when it is cut short. The exposed pulp gets infected and undergoes decay. There will be offensive smelling discharge and the pulp cavity becomes open. The tusk gradually becomes discoloured and loses its lustre. The tusk may subsequently become loose and shaky. Because of irritation, the animal by itself damages the tusk / breaks it.

Treatment:

(i) When the tusk is cut short, it bleeds and the bleeding may be controlled with styptics. The wound may be sealed and contamination prevented.

(ii) The pulp when undergoes decay, the cavity may be cleaned with antiseptics and dressed with antibiotics periodically.

(iii) Parenteral administration of antibiotics

(iv) The pulp does not regenerate. Hence when it degenerates, the growth of tusk will be arrested.

14. Loss / shedding of Tusk:

Loss / shedding of tusk *in toto* was observed in severe fall with the tusk struck or entangled. The tusk gets completely separated from the alveoli (osseous socket) at the root. The cavity will be raw and bleeding.

Treatment:

Cleaning and dressing with antiseptics and styptics. It is treated as open wound. The cavity does not get completely obliterated. Hence periodic cleaning and dressing is needed.

15. Otitis:

Purulent otitis was observed, developed probably as an extension of infection from a peripheral lesion. The discharge is intermittent and offensive smelling.

It responded with antibiotic dressing and parenteral administration.

16. Keratitis Conjunctivitis / Corneal Ulcer/ Corneal Opacity:

Conjunctivitis, Keratitis and Corneal Ulcer in elephants were caused by trauma or injury from foreign body. The inflammation, when become chronic, causes opacity of cornea. The signs noticed were:

(i) Profuse lachrimation with soiling of the cheek.

(ii) Photophobia - animal shows difficulty in opening the eyelids.

(iii) Frothy mass of mucus forming at inner canthus.

(iv) Congestion of conjunctiva

(v) Ulcers and vascularisation of cornea.

(vi) Varying degrees of opacity of cornea.

Treatment:

(i) Cleaning and dressing with antiseptics, antibiotic eye drops.

(ii) Placentrix subconjunctival in chronic cases.

(iii) Anti-inflammatory eye drops - diclofenac / betnesol.

17. Cataract:

Opacity of lens is usually seen in old animals. Partial to complete blindness occurs.

Treatment:

Using Bell Resolvant / Dinoresolvant can be adopted but being a disease of senility there will be no recovery.

18. Rupture of Eye:

Occurs as a result of trauma. Extirpation of eye is done with general anaesthesia.

19. Penetrating Wounds on Chest and Abdomen:

All the cases of abdominal and thoracic wounds were those caused by attack of tuskers. Penetrating wounds with laceration of peripheral tissue was noticed. The depth and direction of wounds varied. The tissue in the vicinity of wounds was seen severely damaged.

The wounds were cleaned and treated as open wounds.

20. Perforating wounds on abdomen with Hernia / Prolapse of Viscera:

The tusk charge injuries that perforated the abdominal wall led on to escape of viscera under cover of parietal peritoneum or without peritoneal covering. The size of the prolapsed / herniated mass varied with the size of the abdominal wound. The organs prolapsed / herniated included omentum and intestines. Depending on the duration of exposure, the viscera showed signs of strangulation, infection or dessication.

Treatment:

The animal was handled under general anaesthesia. Under antiseptic preparation, the wounds were freshened. All dead tissue was removed. The abdominal wound was sutured with catgut after reducing the herniated / prolapsed mass. Provision for drainage was made while suturing. Antiseptic and antibiotic coverage was provided to prevent contamination and infection. Controlled feeding and parenteral alimentation was necessary till healing was noticed.

21. Foot Rot:

A degenerative lesion, involving footpad, nails and underlying tissues. Usually seen in elephants continuously lodged on moist, dirty floor. It is further aggravated by bacterial and fungal infection.

Foot rot is characterised by:

(i) Disintegration of keratinised footpad.

(ii) disintegration / splitting of nails

(iii) separation of portions of foot pad

(iv) purulent pododermatitis with sinuses on pastern region, between nails and above the nails

(v) exposure of sensitive tissue beneath nail and foot pad

(vi) ulcers on foot (vii) lameness

Treatment:

It can be treated by removing all dead and loose tissue and giving formalin footbath. The lesions can be dressed with gention violet or castellanis paint. Excess granulation can be removed by rubbing with copper sulphate crystals. Lodge the animal in clean, dry surroundings.

22. Pododermatitis:

Dermatitis of the pastern region and skin at the junction of the nail. The condition develops from exposure to moist, unhygienic floor.

It is characterised by hypertrophy and keratinisation of skin. Skin becomes thick and hyperkeratosed. It may show splits and ulcers. Foot will be oedematous and painful. Lameness is also noticed.

Treatment:

Remove loose flakes of skin and keratinised tissue and nails. Exuberant granulation can be removed with copper sulphate crystals. Gentian violet or castellanis paint can be used for dressing. Keep the animals in clean dry surroundings.