

CHAPTER - 1

INTRODUCTION AND COMMON TERMS USED IN SURGERY

- **Surgery:** It is an art and practice of treating injuries, deformities and other disorders by manual operations or instrumental appliances.
- **Veterinary Surgery:** The surgical treatment of diseased or injured animals; originally and especially farm and domestic animals.

COMMON TERMS USED IN SURGERY

1. **Aseptic Surgery:** The surgery performed under sterilized conditions to prevent the introduction of infectious microorganisms.
2. **Antiseptic Surgery:** The surgery, that insists upon a systemic use of antiseptics in the performance of operations and dressing of wounds.
“Aseptic Surgery is better than Antiseptic Surgery.”
3. **Inflammation:** A reaction that produces redness, warmth, swelling and pain as a result of infection or injury.
4. **Wound:** Break in continuity of tissue in any part of the body.
5. **Ulcer:** An open wound showing no tendency to heal
6. **Abscess:** An abnormal cavity in the tissue containing pus
7. **Cyst:** A sac or any closed cavity containing liquid or semi-liquid material
8. **Tumour:** A mass of new tissue having no physiological use, which persists and grows independently of its surrounding structure
9. **Necrosis:** Local death of tissue with in the living individual
10. **Gangrene:** Necrosis of tissue with putrefaction by saprophytic bacteria
11. **Hernia:** Protrusion of an organ or tissue through accidental or natural opening
12. **Sinus:** A blind purulent tract showing no tendency to heal
13. **Fistula:** An abnormal opening or passage between two body cavities
14. **Yoke gall:** Localised acute inflammation of skin and subcutis on the neck of cattle due to constant friction caused by yoke
15. **Fracture:** Break in the continuity of bone
16. **Dislocation:** Displacement of a bone from its normal position in relation to a joint

- 17. Haematoma:** Subcutaneous accumulation of blood
- 18. Haemorrhage:** Loss of blood from vascular system
- 19. Epistaxis:** Bleeding from nostril
- 20. Burn:** Injury caused by dry heat (fire, hot solid, electric current)
- 21. Scald:** Injury caused by moist heat (steam, hot liquid)
- 22. Frost bite:** Injury caused by excessive cold
- 23. Paralysis:** Loss of function of muscle
- 24. Paresis:** A partial loss of function of muscle
- 25. Hemiplegia:** A condition in which one side of body is paralysed
- 26. Paraplegia:** Paralysis of hind quarters
- 27. Intussusception:** Invagination of a part of the intestine into an adjacent portion
- 28. Vulvulus (Torsion):** Twisting of loop of intestine on its long axis
- 29. Anaesthesia:** A term used to indicate production of insensitivity
- 30. General anaesthesia:** Drug induced reversible loss of sensory and motor functions with unconsciousness due to depression of CNS
- 31. Local anaesthesia:** Drug induced temporary loss of sensation in a limited area of the body without impairment of consciousness
- 32. Sedation:** A degree of CNS depression in which patient is awake but calm and free from nervousness
- 33. Tranquilizers:** Drugs which cause sedation without drowsiness
- 34. Suture:** A fine cord like structure used for closing the wound
- 35. Ligation:** Tying of ligature (fine cord) to blood vessel
- 36. Herniorrhaphy:** Suturing of the hernail ring
- 37. Cystorrhaphy:** Suturing of ruptured urinary bladder
- 38. Paracentasis:** The perforation of a cavity of the body or a cyst, especially with a hollow

needle to remove fluid or gas

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OBJECTIVES OF SURGERY (“Why surgery is done”)

The principle objective of veterinary surgery is the restoration of animal's functions to as near normalcy as possible.

1. **To eliminate life-threatening maladies:** Choke, Intestinal obstruction, Cancer
2. **To make animal less dangerous:** e.g. Disbudding in calves, Debeaking in poultry
3. **To hasten the recovery process:** Suturing of wounds and fractures' repair
4. **Removal of Foreign Bodies:** Rumenotomy in 'Hardware disease'
5. **To diagnose the disease:** Exploratory laprotomy
6. **For aesthetic purposes:** Removal of supernumerary teats, Ear-cropping in dogs
7. **Removal of a diseased part:** Amputation of gangrenous tail
8. **For economical reasons:** Castration

Definition of a good surgeon: He should have -

1. Full Knowledge of subject
2. Lion Heart
3. Ladies finger
4. Eagle's eye

CLASSIFICATION OF SURGERY

➤ Surgery can be classified according to:

- A. Nature of surgery
- B. Region/system involved
- C. Instruments/appliances used

A. Nature of Surgery: This encompasses (अन्तर्) the following:

1. **Restorative surgery:** It is carried-out to restore the normal function of the body or a part without substituting or discarding any part of the body. e.g. Rumenotomy
2. **Extirpative Surgery:** It involves the removal of a part. e.g. Hysterectomy (Removal of uterus), Cystectomy (Removal of urinary bladder)
3. **Plastic Surgery:** It is done on aesthetic grounds or to restore disturbed function and includes reconstructive surgery and cosmetic surgery.
 - a) **Reconstructive surgery-** It refers to restoration of a function/ normal appearance by reconstructing defective organs or parts. e.g. Repair of recto-vaginal fistula.
 - b) **Cosmetic surgery:** The surgical procedure used to improve the beauty of animal. e.g. Removal of a supernumerary teat
4. **Replacement surgery:** It means replacement of a diseased part by either a living tissue (vascular graft), non-living material (heart valve) or dead tissue (bone graft).
5. **Physiological surgery:** It involves alterations in the normal physiological mechanisms for the benefit of the whole body. e.g. Vascular shunts
6. **Diagnostic surgery:** It involves the surgery to arrive at a diagnosis. e.g. Biopsy, Exploratory laprotomy, Paracentesis

- B. Region/system involved:** Advancements in surgery have led to this classification and surgeons specialize on a particular region or system. e.g. Thoracic surgery, cardiovascular surgery, orthopaedic surgery (The surgery that is done on joints or bones), ophthalmic surgery, neurosurgery, uro-genital surgery etc.
- C. Instruments/Appliances used:** This encompasses the following:
- 1. General surgery:** The term *General surgery* is used when in a procedure common surgical instruments are used.
 - 2. Microsurgery:** In *microsurgery*, big instruments are not used; magnification facilities are used for specialized surgical procedures.
 - 3. Major surgery:** In major surgery, big instruments are used, e.g. diaphragmatic hernia. In major surgery, there may be risk of life.
 - 4. Cryosurgery:** It involves controlled use of substances like liquid nitrogen which produces freezing temperatures to destroy abnormal tissues.
 - 5. Electro-surgery:** In electro-surgery, electricity is converted to heat to incise a tissue.
 - 6. Laser surgery:** In laser surgery, laser beams are used to cut or destroy the diseased tissue.
 - 7. Ultrasonic surgery:** In ultrasonic surgery, high frequency waves are used to destroy a particular tissue or substance. E.g. Lithotripsy

CHAPTER - 2

STERILIZATION IN SURGICAL PRACTICES

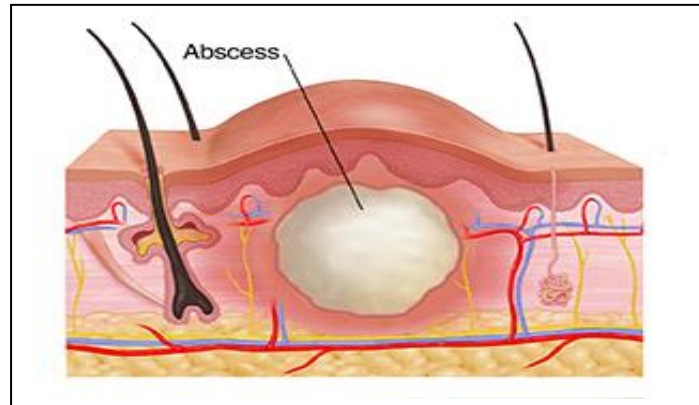
- **Sterilization:** It can be defined as freeing of an article from all living organisms, which includes bacteria, virus, fungi and spores by any process i.e. physical or chemical. There are different methods of sterilization viz. heat, radiation and chemical.
- **Sterilization by heat:** It is of two types: Dry heat and moist heat.
 - i. The **dry heat** can be given by flaming and hot air oven. Sterilization by flame is given by spirit lamp and hot sterilized air. By hot air oven, dry heat is used to sterilize those materials where moisture can spoil the instruments viz. glassware, syringes, sharp surgical instruments, metallic instruments, vaseline and powders. Various temperature and time combinations given for dry heat sterilization are 120° C for 8 hours, 140° C for 2.5 hours, 160° C for 60 minutes and 170° C for 40 minutes.
 - ii. The **moist heat** can be given by boiling and autoclaving (steam under pressure). Boiling of instruments in water for 100° C for 10 – 15 minutes can be used in an emergency as a lesser method of sterilization. Addition of 2 % sodium carbonate increases the sterilizing power of water. A various types of autoclaves are available for the purpose which use steam under pressure. In routine, materials are autoclaved at 121° C under 15 pounds pressure for 30 minutes. The procedure provides moisture and heat under pressure which is more effective than dry heat. Sharp instruments like scissors, needles and other routine instruments of surgical pack excluding sharp scalpel blades, can be autoclaved without reducing their life.
- **Sterilization by radiation:** It can be done by infrared radiation, UV rays and gamma rays. The sharp instruments viz. BP blade is sterilized by infrared radiation. The sterilization by radiation has got advantages that destructive action against microbes is fast and penetrating power is good.
- **Sterilization by chemicals:** There are different chemicals used for various purposes. The chemicals are of two types: gaseous or liquids. Sterilization by chemicals is generally used for scrubbing of hands and preparations of operative sites. The gaseous chemicals used for sterilization are formaldehyde and ethylene oxide. These gaseous chemicals are daily used to sterilize operation theatre, bronchoscopes etc. The liquid chemicals used are 70-90 % alcohol, carbolic acid, gluteraldehyde, Savlon (1:100), Dettol (1:100), KMnO₄ (1:100), Acriflavin (2%), Tr. Iodine (2-5%) etc.
- The other chemicals used are Povidone iodine, mercurochrome, acriflavin and picric acid. These other chemicals are routinely used as surface antiseptics. For killing of spores, a composition of formalin 35 %, NaOH 10 gram dissolved in 1 litre can be used successfully for operation theatre and other dressing material.

CHAPTER - 3

**INTRODUCTION TO SUPERFICIAL SURGICAL AILMENTS
(Abscess, Fistula, Sinus, Wounds, Gangrene, Cyst,****ABSCESS**

The abscess can be defined; as any closed cavity containing pus may be either superficial or deep.

Aetiology: Trauma, Infection (*Staphylococcus, Streptococcus, Clostridium, Corynebacterium*)

**SYMPTOMS AND DIAGNOSIS**

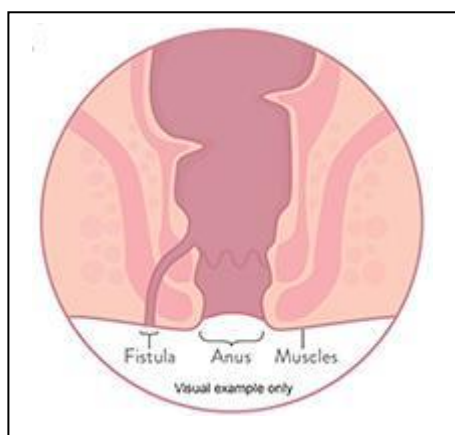
- a) Immature abscess:** Firm, hot, painful swelling on palpation, Paracentesis reveals blood
- b) Mature abscess:** Soft, painless swelling having pointing center and hard at periphery, Paracentesis reveals pus

TREATMENT

- The immature abscess, which is hard to touch initially can be converted into mature one by hot fomentation or by massaging counter irritant such as iodine ointment or Iodex or Turpentine liniment or Blisters.
- The mature abscess will be soft to touch and can be easily opened using scalpel knife after confirmation. Incision should be made in lower area to facilitate drainage.
- After evacuation of pus content, the cavity of abscess should be thoroughly washed with KMnO_4 solution followed by use of Tincture iodine to destroy the pyogenic membrane.
- The dressing should be continued till obliteration of dead space.
- A course of antibiotics is recommended to avoid spreading of infection into the body.

FISTULA

Any abnormal opening between two body cavities is known as fistula. The most commonly seen fistulae are **Salivary Fistula** and **Teat Fistula**.

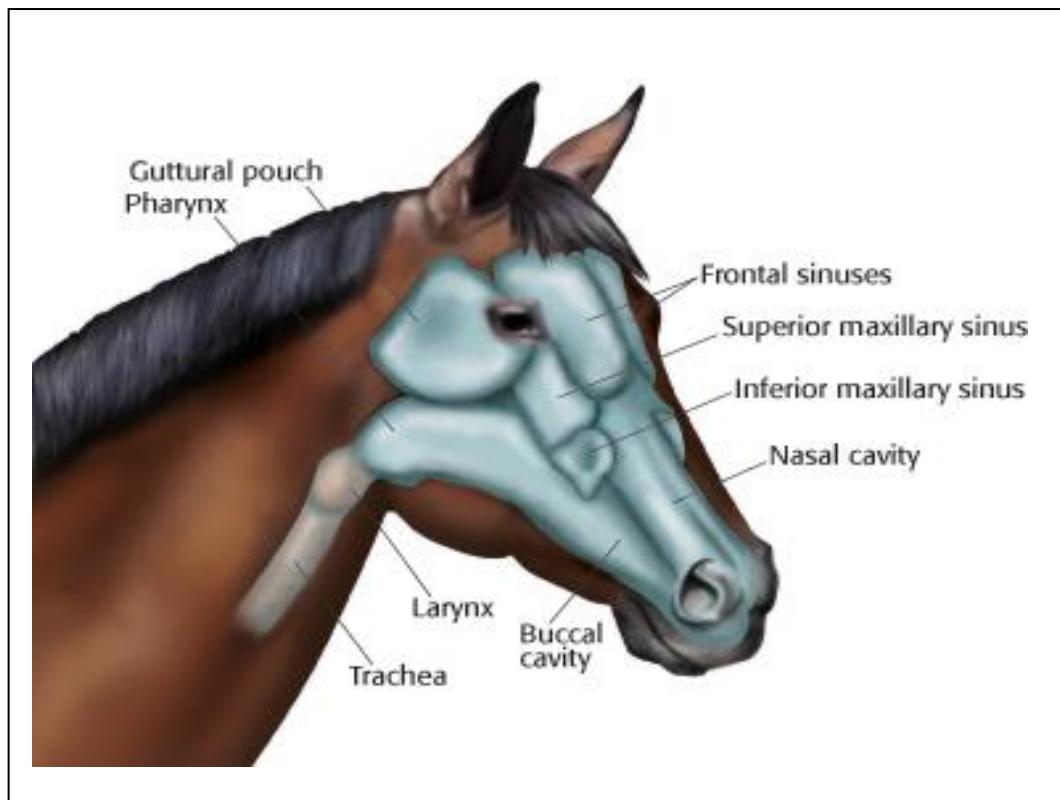


In salivary fistula, the Stenson's duct/ salivary duct is ruptured at the angle of mandible either due to traumatic injury or due to subcutaneous infection. Through the ruptured duct there is continuous dribbling of saliva making the animal sometimes off-feed also. The ruptured Stenson's duct/ salivary duct can be isolated and catheterized after sedating the animal and local infiltration of the site of rupture of the duct. Through the catheter Lugol's Iodine (20 ml) is infused on alternate days to destroy the Parotid gland.

The teat fistula is commonly observed in goats, cattle and buffaloes. The teat canal routinely get lacerated by barbed wire or thorny bushes, while jumping over fence or during grazing, resulting in opening of the teat canal. Through the lacerated portion there is a constant dribbling of milk. The lacerated teat canal is repaired in three layers i.e. Mucosa, muscular portion and skin, layer-wise. The teat catheter is fixed to avoid any leakage through suture line. A course of parenteral antibiotic or intra- mammary infusion for at least five days is must to prevent mastitis.

SINUS

Any blind purulent tract with a constant tendency of oozing pus is known as sinus. The sinuses can be seen over udder, limbs and abdominal walls. The tract of sinus can be cleared by using Tincture Iodine under pressure. A course of antibiotics is recommended for early healing.



WOUNDS

Break in the continuity of skin due to injury (as from violence, accident or surgery), is called wound. The underlying tissue may also get damaged.

CLINICAL CLASSIFICATION OF WOUND

1. **Aseptic wound:** It is a surgical wound made under aseptic conditions i.e. free from bacterial contamination.
2. **Contaminated wound:** The wound invaded by microorganisms where they multiply and produce toxins, is known as contaminated wound. A contaminated wound may become infected after a period of 6-8 hours.
3. **Maggot wound:** It is maggot infestation of a wound due to hatched larva of flies.
Treatment: For soft tissue (Vulvar area in females and prepuccial area in males); Turpentine oil and chloroform (50:50) application and for hard tissue (horns and hooves) Phenyl lotion (2%) can be used. To control the maggots Ivermectin @ 1ml/50 kg can also be given.
4. **Ulcerative wound:** It is the wound, which occurs due to continuous rubbing.

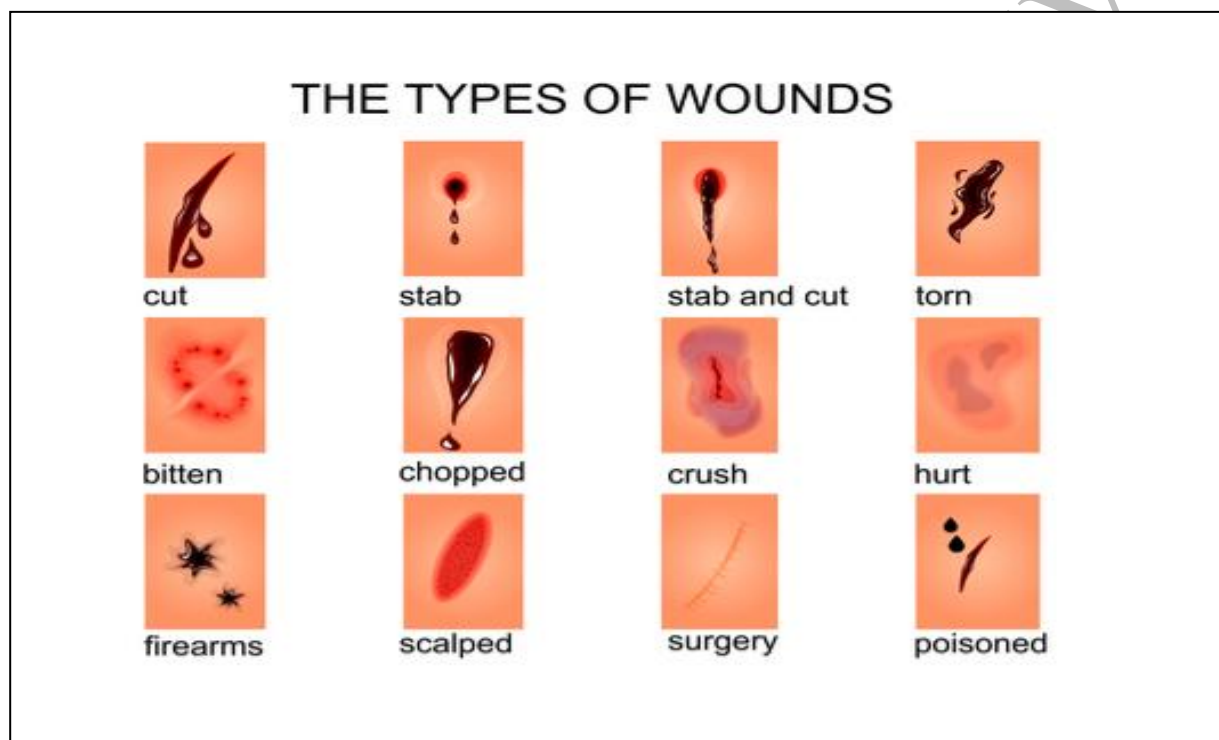
CLASSIFICATION OF WOUND ON THE BASIS OF INJURY

➤ On the basis of injury wounds are classified as **External** or **Internal**.

A. External wound: It is the wound that occurs on external surface of body. Examples of external wound are -

1. Incised wound

2. Contused wound
3. Gun-shot wound
4. Lacerated wound
5. Punctured wound
6. Virulent wound
7. Envenomed wound
8. Burn wound
9. Granulated wound



1. Incised wound: It is caused by sharp edged object (like scalpel or B. P. blade) during surgery. If blood vessels get cut then there may be heavy bleeding.

Treatment: First of all, the injured blood vessels are pressed with artery forceps. After this, that spot is cleaned with sterilise gauze and antibiotic with sterilise gauze and antibiotic powder is applied on that spot and then the wound is sutured. After that, antiseptic dressing (ASD) is done daily. If the wound is contaminated by dust or soil then it should be cleaned with NSS (Normal Saline Solution).

2. Contused wound: It is caused by some blunt object (like stick). A little bit of bleeding may occur in contused wound.

Treatment: Antiseptic dressing (ASD)

3. Gunshot wound: It is also known as **Perforated wound**. It is caused by gunshot (fight/hunting). It causes a lot of bleeding.

Treatment: First of all, bullet is extracted by operation and ASD is done. To save animal from shock, besides antibiotics and tetanus toxoid, dextrose 5% @ 10 ml/kg b.wt. may be

given by slow i/v.

- 4. Lacerated wound:** It is caused by some sharp nail or wire. This type of wound is irregular and jagged

Treatment: First of all, it is cleaned with antiseptic solution. After that dressing is done with antiseptic or antibiotic powder i.e. Terramycin or Nebasulph or M&B antiseptic cream. If lacerated wound occurs in teat than it is called **lacerated teat**; which should be sutured.

- 5. Punctured wound:** It is also known as **Penetrating wound**. It is caused by sharp, penetrating metallic objects; piercing deeply into skin and muscles. Such wounds are deep and painful during palpation of the surrounding area of wound.

Treatment: The immediate treatment of such painful wounds is administration of Non-steroidal anti-inflammatory drugs, antihistaminics and antibiotics to check further spread of infection. Wound is deeply cleaned with antiseptic solution and ASD is done. To save animals from tetanus, tetanus toxoid injection 150 - 300 I.U. i/m can be given. If wound is oozing type, then it should be immediately flushed with cold astringent application followed by antiseptic dressing of Povidone Iodine/Acriflavin.

- 6. Virulent wound (Poison Wound):** It is caused by the biting of rabid dog. Due to biting, virus remains there and can cause the disease of rabies.

Treatment: After cleaning properly, antiseptic dressing is done followed by post bite rabies vaccination.

- 7. Envenomed wound:** It is caused by snake bite.

Treatment: A bandage is tied tightly above and below the wound so that the poison may remain there and would not spread in other parts. After that; more and more blood is extracted from there by giving incision, so that the poison may come out with blood. Antiseptic dressing is done and Antivenum serum and antihistaminic drugs should be given.

- 8. Burn wound:** It is caused by extreme heat, flame, contact with heated objects, chemicals or electricity shock.

Treatment: The mixture of zinc oxide powder and liquid paraffin (1:10) is applied on the wound. The dressing is done with *Soframycin* or *Burnol* antiseptic cream. Antihistaminic drugs and DNS can be given to save patient from shock.

- 9. Granulated wound:** The pink coloured wound, which is showing tendency to heal.

Granulated wounds are found in diseases like Actinomycosis and Actinobacillosis.

Treatment: Antiseptic dressing with Tr. Iodine and Lugol's iodine is done. Besides it, Potassium iodide 8 - 10 gram for 5 days orally; is given.

SOME COMMON WOUNDS IN FARM ANIMALS

1. Horn wound

2. Teat wound

3. Hoof wound

4. Tail wound

1. **Horn wound:** It occurs due to avulsion or fracture of horn core. It can be treated in the

following ways -

- The bleeding from the horn can be checked by either local haemostat e.g. Tinc. Benzoin co., Tinc. Ferric Chloride or if there is complete separation, hot iron rods can be used to check the bleeding or systemic haemostat such as Chromostat.
 - For antiseptic dressing, BIPP or ZIPP are very effective.
 - If there is a necrosed wound, then use of **Glycerine and Magsulf paste** is very useful.
 - If maggots are present in the injured horn phenyl mixed with mustard oil (1:4) is suggested.
2. **Teat wound:** Teat wounds usually take longer time for healing due to their anatomical and managerial problems. The immediate treatment is the use of antiseptic and anti-inflammatory creams e.g. as Inflamin (Indian Herb), Voveran gel, Betnovet-N etc. to control the inflammation. In long standing cases, where surface of wound is necrotic and black in color, then carbolic acid, hydrogen peroxide, copper sulphate is used to remove the necrosed portion, followed by antiseptic dressing with BIPP or ZIPP.
 3. **Hoof wound:** Hoof wound are managed by using combination of phenyl and mustard oil after flushing of the hoof with Condy's (KMnO_4) solution. The FMD lesions can be controlled by use of Topicure (Natural Remedies) spray. The overgrown hoof can be trimmed by hoof - cutter to prevent some of hoof problems.
 4. **Tail wound:** The wounds over tail also take longer time for healing. The wounds of tail can be effectively dressed with Charmil, Himax, and Lorexane etc. Some time cases are presented in form of tail injury following recent accident, then bleeding can be checked by local haemostat like KMnO_4 crystals, Tinc. Benzoin co., Tinc. Ferric Chloride etc.
Dry gangrene of tail can be managed in early cases by messaging of counter irritants such as Iodine ointment (Iodex[®]), Turpentine liniment. If necrosed or gangrene portion get infected then, dry gangrene will get converted into moist one. From moist gangrene, there will be foul smelling discharge, loss of hairs and sensation. Such type of gangrene is treated by docking or amputation of the tail.

PARTS OF WOUND

➤ A wound has two parts - Contents of wound **and** wall of wound.

1. **Content of wound:** The quantity of pus in the wound is called content of wound.

2. **Wall of wound:** The area of skin around the contents is called the wall of wound.

It has three parts – Central zone, Ischemic zone and zone of reaction

a. **Central zone:** It is that part of the wall which is near the contents of wound. There are dead tissues in that part and sometimes its colour gets blue.

b. **Ischemic zone:** It is the outer part of the central zone and blood circulation and vitality of tissue is low in this zone.

c. **Zone of Reaction:** It is the outer part of Ischemic zone and there is acute inflammation and pain.

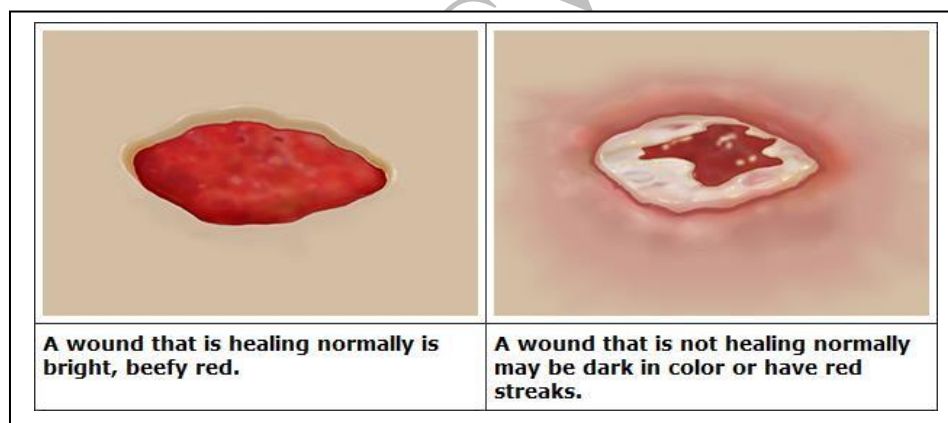
GENERAL TREATMENT OF EXTERNAL WOUND

❖ During the treatment of wound, the dressing material of instrument must be bacteria free.

Antiseptic medicines kill the bacteria. Antiseptic solution cleans the bacteria around the wound and bandage prevents entering of bacteria into the wound. The following points should be kept in mind during the dressing of wound:-

1. Hair must be removed from that spot because hair causes hindrance in the healing of wound.
2. Wounds must be cleaned properly with Antiseptic solution and gauze must be used to clean it but take care that it must not cause abrasion on wound.
3. A piece of gauze dipped in antiseptic solution or antiseptic cream should/must apply on wound and cotton should be avoided as far as possible because fibres of cotton stick with wound and when it is untied then it causes bleeding. Antiseptic powder is used for dressing of wounds.
4. Generally, the dressing of wound is done once in a day. Sometimes, ASD is done two times in a day. If wound starts healing, then dressing is done through BIPP giving the gap of a day.
5. At the time of undressing, gauze must not be pulled forcefully if it is stuck with wound. To strip off gauze, the solution of $KMnO_4$ is poured slowly. If $KMnO_4$ is not available then it can be stripped off with help of warm water or savlon. Wound is always cleaned softly.
6. If there are maggots inside the wound then the dressing is done with Phenyl+ mustard oil or T.T. oil + chloroform.
7. To prevent contamination inside the wound, antibiotics are given parenterally.

HEALING OF WOUND



➤ Healing of wound occurs in following stages:-

1. Healing by first intention
2. Healing by second intention
3. Healing by mixed intention
4. Healing under scab

1. Healing by First Intention: First intention healing occurs under ideal conditions. Wound heal rapidly with no separation of the edges. Healing by first intention occurs when there is no infection in the wound. Due to the absence of infection, wounds heal rapidly.

2. Healing by Second Intention: Second intention healing occurs when a wound fails to heal by primary union. It generally occurs in large wound in which infection has caused breakdown of sutured wound. This type of wound is also known as contaminated wound.

3. Healing by Mixed Intention: Mixed intention healing is the healing of a wound partly by

first intention and partly by second intention. This type of healing occurs in a wound which has some contaminated part. e.g. During the treatment of incised wound suturing is done. If some sutures disrupt, it causes contamination. Its healing occurs by second intention. This type of healing is termed as mixed intention.

- 4. Healing Under Scab:** During the healing of small wound, a scab comes over it. When wounds heal properly then scab gets peeled off. This is called healing under scab.

INTERNAL WOUND

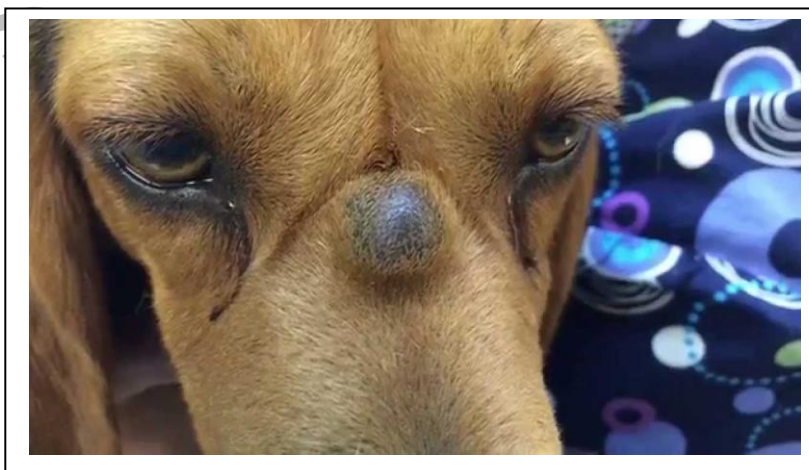
Internal wounds are the wounds in which skin remains intact but the underlying tissue got damaged. This type of wound results from some blunt object like stick. The injury to the underlying tissue will result in rupture of blood vessels causing discoloration of skin.

If the extravasated blood becomes encapsulated, it is termed as haematoma and sometimes muscles got damaged and pus accumulates there, which is termed as abscess. Urinary bladder rupture due to obstructive urolithiasis is also a type of an internal wound.

TREATMENT OF INTERNAL WOUND

- If the case of internal wound comes before 48 hours then it is treated as acute inflammation. Cold Astringent application is used for its treatment. If the case comes after 48 hours, then it is treated as chronic inflammation. Hot & counter irritants are used for its treatment.
- If internal wound is the case of haematoma then that spot is opened and treated. The damaged blood vessels are ligated and ASD is done.
- If the internal wound is the cause of abscess then for its treatment, the pus is extracted by giving a cut on the spot and ASD is done. Besides ASD, antipyretic injection is given to animal.
- If internal wound is due to bursting of urinary bladder then cystorrhaphy is done.

CYST



Cyst can be defined as 'painless uniform soft fluctuating swellings containing serous/watery fluid inside it'.

OR

"A sac or any closed cavity lined by epithelium and contains watery or serous fluid."

In domestic animals cysts are of various types. The most common is parasitic cysts followed

by 'retention cyst'. The location of parasitic cyst is variable and depends upon the type of parasite present in the body. The common location of the cysts is lungs, brain, liver, ovary and different sites of skin.

In the skin, cyst can be located at various regions and the most common are mandibular cysts. These cysts can be controlled by regular deworming of the animals.

The other types of cysts are known as retention cyst can be formed by failure of physiological function of that particular organ e.g. The salivary cyst can be observed below the tongue and in the mouth cavity due to blockage of opening and accumulation of the saliva. This types of swellings/cysts are not true cysts, but due to accumulation of saliva there will be physiological as well as functional disturbance of the affected organ. In cases of ranula (salivary cyst below the tongue) there will be difficulty in movement of the tongue and the animal will unable to take the feed. If it is inside the mouth cavity, then there will be difficulty in the mastication. These false cysts can be corrected by application of Glycerine-Magnesium sulphate paste. The true cyst can be controlled by eliminating the cause.

These cysts, if present in the lungs, then they will cause respiratory distress and coughing. Similarly, if present over the brain area, then it will result into circling movement especially in goats and the condition is known as GID. If the affected organ is liver, then the animal will show signs of anorexia and debility conditions. If cyst is involving the ovary, then the animal will show signs of anoestrous.

These parasitic cysts can be diagnosed on the basis of history and clinical signs and the diagnosis is confirmed by means of radiography and angiography. After confirmation of diagnosis, they are removed from the vital organs by surgical intervention. Therefore, such types of cysts not only require regular deworming of the animal body, but also require complicate surgical intervention and sometime, even surgical methods fail to take the cyst out. The cases of cyst also show recurrence even after complete removal. The cyst is present in form of the swellings that is why it should be differentiated from abscess, hernia and tumours.

Line of Treatment: Drainage of the cyst, irrigation with antiseptic solution followed by dressing with tincture iodine

TUMOUR (NEOPLASM)

Neoplasm: The word neoplasm means new growth. It means formation of new tissue. A neoplasm is caused by a purposeless multiplication of living cells.

➤ Tumours can be classified into two types - Benign Tumour and Malignant Tumour

i. Benign Tumour: A benign tumour does not recur after removal. It is not harmful can be easily removed through operation. Its treatment can be done by any of the following techniques -

- a) **Ligation:** A tight ligature is applied at the base of tumour so as to cut off its blood supply. The tumour sloughs off within about ten days. After that ASD is done.
- b) **Firing:** The tumour is clamped below its base and the red-hot iron is applied so as to remove the tumour. After that ASD is done.
- c) **Surgical Removal:** Tumour can be removed through operation. Care should be taken to remove all the tumour cells and if the surrounding lymph glands are involved they should

also be removed. After that, antiseptic treatment should be given.

ii. Malignant Tumour: Malignant tumours (cancer), grow rapidly and give rise to secondary tumours in their vicinity as a result of neoplastic elements carried through the blood or lymph stream. Malignant tumours in the great majority of cases are incurable. Its treatment can be done in following ways -

- a) **Radiotherapy:** Repeated X-rays photographs reduce the growth of cells.
- b) **Surgical removal:** Treatment is useless in the case of malignant tumours, but temporary relief may be given by total excision of the tumour by surgery.
- c) **Chemical Therapy:** Chemicals like -6 Merceptopurine, -6 Diaminopurine, -6 Folic acid antagonists are used as chemical therapy. Sometimes, all the three drugs are used in combination and sometimes only one is used.

CYST VERSUS TUMOR	
Cyst is a cavity filled with air, fluid or any semi-solid material	Tumor is a non-specific term which refers to an abnormal mass of tissue that occurs due to abnormal cell-division
Most likely a result of an infection or obstruction of a gland	Usually have a genetic predisposition and most tumors don't have a clear root cause
Usually soft since they are mostly filled with soft contents	Hard in consistency since they are formed with tissues or cellular swellings
90% of the cysts developing in our body is found to be benign or non-cancerous	Malignant tumors have a significantly higher incidence
Have a possibility of creating several complications following enlargement and rupture	Not life threatening unless they are malignant in nature
	<small>Pediac.com</small>

GANGRENE

Gangrene is the death of tissue in a living body, caused by a bacterial infection resulting from a blockage of the blood supply to the affected tissue. e.g. Tail gangrene

TAIL GANGRENE

1. Tail gangrene is rotting of tail due to failure of blood supply.

Aetiology: Trauma, Infection (Infection may spread upto spinal cord and cause paralysis; if the treatment is delayed), Ischemia

Symptoms: Alopecia and loss of sensation at the site, Line of demarcation between healthy and gangrenous part

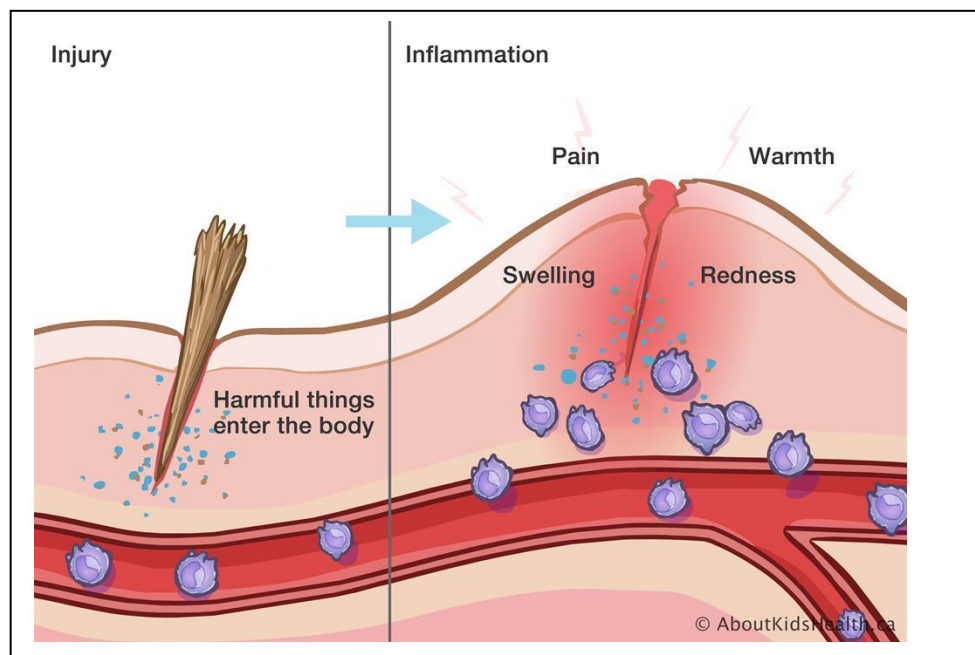
Treatment: Amputation of tail proximal to gangrenous part (Tail docking)

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CHAPTER - 4

INFLAMMATION

Inflammation: A reaction that produces redness, warmth, swelling and pain as a result of infection or injury. It is a protective mechanism.



Aetiology: It is caused due to following reasons:

1. **Mechanical:** Trauma (e.g. any external violence)
2. **Chemical:** Caustic Potash, Sulphuric acid, HCL, Silver nitrate, Formaldehyde
3. **Physical:** Excessive cold, Heat, Electricity, Irradiation
4. **Infectious:** Streptococcus, Staphylococcus, Pseudomonas (Mastitis) and E. coli and Salmonella in intestine

FIVE CLASSICAL SIGNS OF INFLAMMATION

- ❖ The traditional names for signs of inflammation come from Latin language.
- 1. **Rubor** (Redness) – Due to increased blood flow
- 2. **Tumor** (Swelling) – Accumulation of fluid
- 3. **Calor** (Heat) – Due to increased blood flow
- 4. **Dolor** (Pain) – Due to release of chemicals such as bradykinin and histamine
- 5. **Functio laesa** (Loss of function)
- **Temperature:** If the inflammation is due to bacterial or viral infection then pyrexia will be there.

TYPES OF INFLAMMATION

- Inflammation is of two types:
 1. **Acute Inflammation:** It is caused by a severe irritant i.e. so strong that defence mechanism of body cannot face it. The swelling will be of red colour and painful.
 2. **Chronic Inflammation:** It is caused by mild and frequently repeated attack of an irritant and the defence mechanism of body can face it. The swelling will not be so red and painful as

acute.

INFLAMMATION OF VARIOUS PARTS OF BODY

(Suffix - 'itis' refers to inflammation)

Sr. No.	Organ	Inflammation
1.	Mouth (Buccal cavity)	Stomatitis
2.	Tongue	Glossitis
3.	Gum	Gingivitis
4.	Pharynx	Pharyngitis
5.	Nasal mucous membrane	Rhinitis
6.	Larynx	Laryngitis
7.	Trachea	Tracheitis
8.	Bronchi	Bronchitis
9.	Alveoli	Alveolitis
10.	Lungs	Pneumonia
11.	Oesophagus	Oesophagitis
12.	Stomach	Gastritis
13.	Intestine	Enteritis
14.	Liver	Hepatitis
15.	Urinary bladder	Cystitis
16.	Urethra	Urethritis
17.	Vagina	Vaginitis
18.	Udder	Mastitis
19.	Glans penis	Balanitis
20.	Cervix	Cervicitis
21.	Bone	Osteitis
22.	Meninges	Meningitis
23.	Kidney	Nephritis
24.	Conjunctiva	Conjunctivitis
25.	Cornea	Keratitis
26.	Ear	Otitis
27.	Joints	Arthritis
28.	Uterus	Metritis
29.	Uterine endometrium	Endometritis

30.	Testis	Orchitis
31.	Sinus	Sinusitis
32.	Muscle	Myositis
33.	Skin	Dermatitis
34.	Fallopian tube	Salpingitis
35.	Endocardium	Endocarditis
36.	Pericardium	Pericarditis
37.	Myocardium	Myocarditis
38.	Artery	Arteritis
39.	Vein	Phlebitis
40.	Peritoneum	Peritonitis

OUTCOME OF INFLAMMATION

2. The possible outcomes of inflammation are: -

- 1. Resolution:** The complete restoration of the inflamed tissue back to a normal status is known as resolution. The fluid accumulates inside the swelling but slowly this exudate gets absorbed in muscles and inflammation terminates.
- 2. Suppuration:** The inflammation that is produced by bacteria; results in pus production that leads to formation of abscess.
- 3. Gangrene:** The severe inflammation results in massive death of tissue i.e. known as gangrene.
- 4. Fibrosis (Induration):** In fibrosis, there is large amount of tissue destruction, that cannot be regenerated completely by the body. The fibrous tissue accumulates on the affected area then swelling becomes hard, it is termed as induration. It occurs mostly in working bullocks.
- 5. Chronic inflammation:** In acute inflammation, if the injurious agent persists then chronic inflammation will ensue.

TREATMENT OF INFLAMMATION

A. Cold and Astringent application

B. Hot application

A. Cold and Astringent Application: Cold and astringent application are used in the treatment of acute inflammation. Cold water and the bandage dipped in cold water will serve the purpose.

1. Ice-pack application: Ice, in the plastic or rubber bags is applied on the affected area.

2. Application of white lotion/lead lotion (Astringent lotion) – By application of white lotion the affected area can be kept cool for a long time. The composition of Astringent lotion is –

Composition of White Lotion

Lead Acetate	1 Part
Zinc Sulphate	3 Part
Distilled Water	80 Part

➤ *Bandage dipped in astringent lotion is tied on the affected area, and if we pour the lead acetate lotion on it, it remains cool for a long time.*

B. Hot fomentation: Hot fomentation will change the chronic inflammation into acute inflammation. Hot fomentation can be done by following methods –

1. Hot Water Irrigator: In this method, water is heated at 104 - 112° F and then it is poured on the affected area with the help of irrigator. By pouring hot water; chronic inflammation changes into acute inflammation.

2. Hot Water Bandage: Bandage dipped in hot water is tied on the affected area. To keep it warm, hot water is poured continuously. This will change the chronic inflammation into acute inflammation.

3. Hot Poultice: Hot poultice of treacle is tied on the affected area. Some magnesium sulphate or sodium chloride is poured in it to keep it warm for some more time.

4. Infrared lamp: It is a specific type of lamp. After switching it on, it is kept in front of the affected area. It makes that area warm.

5. Firing: Firing is done to change the chronic inflammation into acute inflammation.

6. Application of Medi-cream: Some ointments can decrease the inflammation.
e.g. Hydrocortisone, Betamethasone, Dexamethasone, Vetalog, Prednisolone & Iodine

7. Application of Counter-irritant: These drugs will change chronic inflammation into acute inflammation by doing irritation. These counter irritants are as following:-

a) Rubefacients: These drugs increase blood supply if applied or massaged and change chronic inflammation into acute inflammation.

I. Weak Tr. Iodine: Camphor liniment

II. Iodine ointment: Ammonia camphor liniment

III. Lugol's ointment: A.B.C. Liniment (Aconite Belladonna Camphor)

IV. Methyl Salicylate: Used for making liniment (25% M.S.) and ointment (5% M.S.).

b) Blisters: The ointment made up of Vaseline and irritant drugs is called blister. It should be rubbed vigorously. The blisters should not be used on joints. Hairs should be clipped before applying blisters. e.g. 1:8-Mercury blister, 1:6 Cantharidin blister

c) Firing: Firing is also used to change chronic inflammation into acute inflammation. Firing is of five types:

1. Superficial line firing: Firing iron flat is used in this method. Red hot iron is applied on the

affected area in the form of a line, lines should be parallel to each other. This iron is put on the skin until it gets a line of brown colour. Iron-flat must not cross skin.

2. **Superficial point firing:** Firing iron point is used in this method. Red hot firing iron point is applied on the affected area and it is kept there until the skin got brown colour.
3. **Objective firing:** Any instrument can be used in this method. Red hot instrument is applied on the affected area and it is kept there until the skin got brown colour.
4. **Needle Point Firing:** In this type of firing, long and thin needle is used. The heated needle is applied on the affected area until it reaches to the bone after crossing skin and muscles.
5. **Penetrating Point firing:** Red hot firing iron point is put on the affected area until the skin got burnt and subcutaneous tissues are seen.

d) Pustulants: If the inflammation is because of bacteria, then there is pus formation. To treat, this type of inflammation, Pustulants are used.

These are of two types – Seton and Rowels

(a) **Seton (Strip of linen or the like, introduced beneath the skin by a knife or needle)** - After maturation of abscess, it is incised at two places; one above and one below the site. These cuts should be parallel to each other. After draining pus completely, a gauze dipped in irritant solution is tied from outside. It is called 'Seton'. After tying it, pus evacuates from dependent parts.

(b) **Rowels:** It is used as Seton. Soft leather is used instead of Gauze.

CHAPTER - 5

INTRODUCTION TO DENTAL CARE

- In ruminants, the common anomalies of teeth observed are:-
1. Enlarged molars
 2. Sharp teeth
 3. Dental caries and
 4. Irregular teeth table
- Due to enlarged molars, the animal will show restricted rumination, salivation through mouth and will pass undigested faeces. There will be gradual loss of body condition of the animal due to enlarged molar. There can be sometime grunting sound also. The enlarged molars can be diagnosed after examination of the mouth cavity after sedating the animals. The enlarged molars are cut with tooth cutter and the remaining portion is rasped with tooth-rasper. The mouth cavity, after cutting and rasping of enlarged molar should be washed with KMnO_4 solution.
 - The ruminants can become off-feed due to oedema of the oral/buccal-papillae. Due to oedema, the papillae become turgid and painful and the animal will be partially off-feed. The examination of the mouth cavity will reveal turgid, elongated papillae. The oedema of the buccal papillae can be revealed by applying glycerine-magsulf paste and using non-steroidal anti-inflammatory drugs along with antibiotics.
 - Dental caries is uncommon in cattle and occasional case are observed in buffaloes and camels. Clinical signs include salivation, difficulty in mastication and simple indigestion. On inspection of the mouth, a characteristic foul smell is a usual feature in camels and buffaloes. Pain is evident because most cases are reported at last stage. Dental extraction by rotation of the affected tooth under local anaesthesia is easily performed. Daily cleaning of the oral cavity with light potassium permanganate solution (1:1000) is usually the only post-extraction treatment given in such cases.

CHAPTER - 6

INTRODUCTION TO HOOF MANAGEMENT

➤ Some common affections of hoof in farm animals are – Sand cracks, Thrush & canker.

1. **Sand Cracks:** A condition in which cracks come on the hoof wall. The cracks can either start at the bearing surface and progress up the foot or start at the coronet and go down.

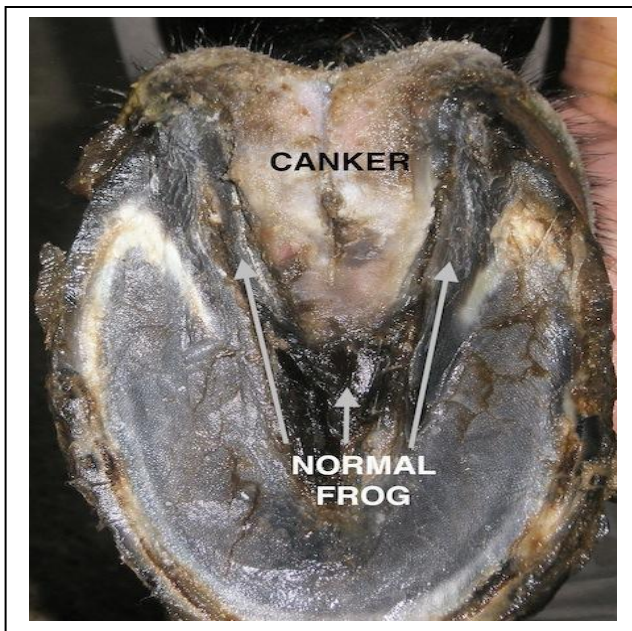


Etiology: Coronet injury, improper trimming, kicking sharp objects

Signs of sand cracks: The split in the hoof wall is obvious. Infection in these cracks will result in discharge of blood or pus.

Treatment: Corrective trimming and shoeing to prevent the portion of the hoof wall around the crack from bearing weight. If there is some kind of exudates (blood/pus) oozing out from cracks, then clean the affected area properly (2% CuSO₄ can be used) followed by ASD. Pressure bandage is tied after antiseptic dressing.

2. **Thrush and canker:** These two affections are commonly associated with a horse's frog. The most common of the two is thrush, which is a bacterial infection that occurs on the hoof of a horse, specifically in the region of the frog. Canker in the horse is an infectious process that causes a chronic hypertrophy of the horn producing tissues of the equine hoof. In contrast to thrush, which is a necrotic or tissue-destroying process, canker creates abnormal tissue growth and is described as a hypertrophic pododermatitis. Canker is less common, and it is much more challenging to treat.
3. **Etiology:** *Fusobacterium necrophorum* is the causative organism of thrush in horses, and occurs naturally in the animal's environment – especially in wet, muddy or unsanitary conditions such as unclean stall and grows best with low oxygen.



CANKER VS. THRUSH

- Canker is often misdiagnosed initially as thrush
- Sometimes mild lesions are not very distinct, visually
- If treating thrush and lesion not resolving with routine treatment...
= be suspicious of canker



4. Symptoms: The most obvious sign of thrush is usually the odor (bad smell) that occurs when picking out the feet. Additionally, the infected areas of the hoof will be black in colour and will easily break or crumble when scraped with a hoof pick. **Treatment:**

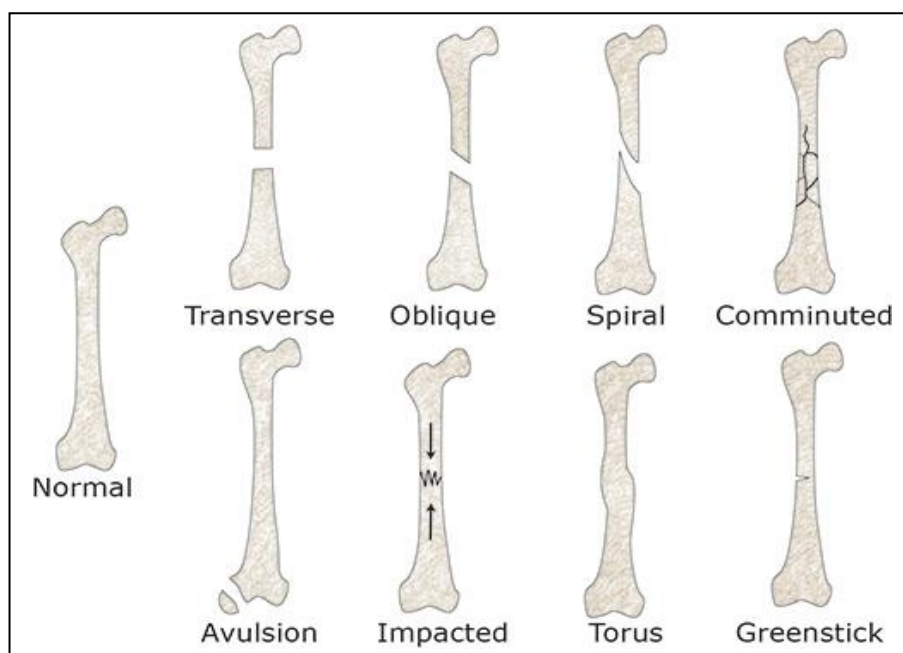
1. Twice-daily picking of the feet, taking special care to clean out the two collateral grooves and the central sulcus.
2. The feet may then be scrubbed clean using a detergent and/or disinfectant and warm water followed by antiseptic dressing.
3. If there is pus, then dressing is done with 10% formalin.
4. After dressing, put the dressing box shoes on it, this shoe prevents the frog part from unhygienic things.
5. Injection of broad spectrum antibiotics is also given to animal.

Prevention: Horses with thrush, or those at risk for contracting it, are best kept in a dry, clean environment.

CHAPTER - 7

FIRST AID MANAGEMENT OF FRACTURE

5. **Fracture:** Fracture may be defined as any break in the continuity of the bone and its matrix.



CLASSIFICATION OF FRACTURE

6. Broadly, fracture can be classified into two main types –

1. **Closed Fracture** - It can be further sub typed into various categories depending upon the line of Fracture (transverse, longitudinal, oblique, spiral and comminuted), injury of the surrounding tissue (complete or incomplete). In Complete fracture both cortices of bone are involved, but in incomplete type, only one cortex is fractured. This type of fracture is most commonly seen in young animals.
2. **Open or Compound Fracture** - The Fracture may cause injury to the surrounding muscles, nerves, vessels etc., and in some cases it may become open and this type of fracture is known as Compound Fracture.

COMPLICATIONS OF FRACTURE

➤ It can be mal-union, delayed union, and non-union.

1. **Delayed union:** The normal time of fracture healing in an adult animal is 6-8 weeks, but when this time exceeds, then the union is known as delayed union.
2. **Non-union:** In some cases, when surrounding structures come between two fractured ends, then the healing will fail to unite the two fractured ends, this type of union is known as Non-Union.
3. **Mal-union:** When the immobilizing technique is either weak or loose, then the union will take place at a particular angle, but not in a straight line, this type of union is known as

angular deformity or mal-union.

STAGES OF FRACTURES HEALING

➤ If the Fractured bone is immobilized in an adequate manner, then healing will take place in the following sequences:

1. Hematoma formation
2. Soft Callus formation
3. Hard Callus formation
4. Remodelling phase

1. Hematoma Formation: During fracture, the blood vessels both internal and external get teared off, resulting in oozing of blood in between the fractured end and in the surrounding tissue. This blood will get clot to form a large hematoma at the fractured site. This hematoma acts as bridging structure between two fractured end and act as an scaffold for invading blood vessels and fibroblasts. This stage is known as Hematoma Formation.

2. Soft Callus Formation: After formation of hematoma, the environment will decide about the formation of fibrous callus or cartilaginous callus. The bone cells, either from ruptured periosteum or endosteum migrate into the hematoma. These cells are pluripotent. If oxygen concentration is higher, they will get converted into cartilage cells otherwise remain as bone cells. These cells get trapped into the fibrin mess of the hematoma to form soft callus. If migration of cells is from periosteum, then the callus is known as external callus. If it is from the endosteum, then the callus is known as internal callus.

3. Hard Callus Formation: The soft callus so found, get mineralized to get converted into hard callus, the main minerals are calcium, phosphorus, phosphates and carbonate. The main source of these minerals is external i.e. from diet. This hard callus is solid bridge between the two fractured ends.

4. Remodelling phase: The hard callus formed is a solid mass, but under the influence of hormones (Calcitonin, Parathyroid and Cholecalciferol) becomes porous. The osteoblastic and osteoclastic activities in this hard callus will results into the formation of Haversian system, medullary cavity and spongy bone, and this process usually takes 6 to 8 weeks time.

CLINICAL SIGNS

➤ Following are the main clinical signs, seen in cases of fracture -

- ✓ Inability to bear weight on the affected limb
- ✓ Swelling at the Fracture site
- ✓ The cases can be diagnosed by means of radiography

FIRST AID IN CASES OF FRACTURE

The cases of Fracture should be handled as early as possible so that it may not become open

or compound. The closed fractures cases should be immediately immobilized by use of splints and bandages and a course of antibiotics and tranquilizers should be used to check the bone infections and pain, respectively.

IMMOBILIZING TECHNIQUES

The fracture can be immobilized by two main techniques -

1. **External Techniques** – Plaster cast, Thomas splint, Hanging-pin cast, Transfixation
 2. **Internal Techniques** – Intramedullary pinning, Bone plating, Wiring, Screwing
- Out of all these techniques, the plaster cast is most commonly used technique for repair of the lower long bones (metatarsus and metacarpus). Hanging pin cast for radius and ulna. Transfixation for tibia (middle long bones). For upper long bones i.e. humerus and femur intramedullary pinning and nailing is common in practice.
- For application of plaster cast, usually three layers are applied, the first layer is of padding material in form of cotton. Second layer is of reinforcing material i.e. splints may be iron, aluminium and wooden. The third layer is of cementing layer. The most common cementing material is plaster of paris. The plaster of paris can be used in bandage form under the trade name of Velroc (Johnson & Johnson), Gypsona, Real cast and Saffix. The cementing layer is usually applied in three or four layers and it should be upto the hoof of the animal to get good results. Such types of plaster cast are known as heavy cast. This heavy cast has certain disadvantages i.e. it is very heavy, get spoiled by water and radio-opaque. To overcome these problems, now a days, light plaster cast is in common use. These light casts are light in weight, water proof and radiolucent, but they are difficult to remove.

PROGNOSIS

- Prognosis will depend upon type of Fracture i.e. open or closed, duration of Fracture and type of technique involved. The prognosis is considered grave in cases of open Fracture and long duration cases. The animals having tendency to get up have good prognosis. For open Fracture, usually a window is created into the plaster cast for daily antiseptic dressings.

CHAPTER - 8

FIRST AID MANAGEMENT OF BLOAT

5. **Bloat:** It is an abnormal distension of the rumen and reticulum caused by excessive accumulation of the gases of fermentation either due to increases production of gas or physical obstruction of the process of eructation of gas.
6. Bloat is of two types - Primary bloat and secondary bloat

PRIMARY BLOAT

7. It is usually frothy type of bloat, which occurs due to excessive production of gas in rumen.

Aetiology

1. Excessive intake of immature green leguminous fodder like berseem result in frothy bloat
2. Excess intake of soluble carbohydrates (finely ground grains)
3. Less intake of dry roughage/fibrous food
4. Sudden change in feed etc

Symptoms

1. Enlargement of left flank
2. Anorexia, dullness, depression,
3. Dyspnoea, increased respiration rate and heart rate,
4. Tympanic sound on percussion,
5. Ruminal motility is initially increased and atony in later stages

Treatment

- Withdrawal of food and water for first 24 hours
1. Give carminative mixture - Turpentine oil 30-60 ml and mustard oil 400 -500 ml, orally as drench
 2. Use of Bloatosil @ 50 - 100 ml as drench in frothy bloat
 3. Correction of rumen pH
 4. Massage of left flank and exercise

SECONDARY BLOAT

- It is usually dry bloat, which occurs due to failure of eructation of free gas.

Aetiology

1. Oesophageal obstruction (choke)
2. Vagus indigestion
3. Traumatic reticulo-peritonitis (TRP),
4. Tetanus,
5. Diaphragmatic hernia,
6. Allergy,
7. Hypocalcaemia etc

Symptoms

1. Enlargement of left flank,
2. Anorexia, dullness, depression,
3. Abdominal pain (grinding of teeth, kicking at belly, rolling on the ground),
4. Dyspnoea, increased respiration rate and heart rate,
5. Tympanic sound on percussion,
6. Ruminal motility is initially increased and atony in later stages

Treatment

1. Trocarisation of rumen with trocar –cannula to give relief from pressure
2. Pass stomach tube or probang to remove gas from rumen.
3. Give 500 ml – 1000 ml liquid paraffin or sweet oil to adult cattle or buffalo.
4. Give injection oxytetracycline @ 15 – 20 ml, intra-ruminally
5. Antihistaminics – Injection Avil/ Cadistin/ Anistamin @ 5 – 10 ml IM
6. Exploratory rumenotomy in severe/non-responsive tympany

CHAPTER - 9

FIRST AID MANAGEMENT OF HAEMORRHAGE

(Greek word "Haima"=blood; "Rhegnumai"=to break forth (burst out suddenly))

- **Haemorrhage:** It is defined as an escape of blood from a ruptured blood vessel.
- Haemorrhage may be internal or external. The internal haemorrhage is observed inside the body cavity due to any injury to the organs of liver, spleen or mesentery or other internal body organs. The external haemorrhage is visible and can be seen due to any injury of the external body parts e.g. horn, limbs, teats, tail etc. The haemorrhage may occur either from artery or from vein. If the haemorrhage is from artery, then blood loss will be quicker and should be checked immediately. Depending upon the source, the haemorrhage may be arterial, venous, arteriole, venule and capillary. The haemorrhage will be more profused, if it is from horn, hoof or udder, so immediate arresting of bleeding is required. Such type of haemorrhage is observed in case of accidents. This can be checked by application of tourniquet. If bleeding is from nostrils, then ice-cold water application can be used to control the bleeding.
- Depending upon the source there are different methods of arresting haemorrhage e.g. if it is from the capillary, then simple pressure by gauge is sufficient to control it. Such type of bleeding usually is seen during different surgical interventions. The bleeding from arteriole or venule can be checked by application of haemostat (artery forceps). If the bleeding is from the major vessels, then application of ligature such as silk is to control the bleeding. If haemorrhage is internal e.g. from liver or spleen, mesentery, then systemic haemostat such as adrenochrome (Chromostat) and vitamin k (Menadione or Capillin) should be given. The internal bleeding can also be checked by using drugs such as ethamsylate. If the bleeding is from the vagina, then Alum crystals mixed in ice-cold water can be used to control it. If haemorrhage is from caruncles, then packing of vaginal passage with surgical-drapes followed by intravenous use of calcium is required. If the bleeding is from teat mixed with milk, then it can be checked by the use of formalin 10 % or Styplon boli.
- During performing surgery, bleeding from the hard tissues can be checked by firing. During removal of tumours bleeding can be checked by electrocautery. To compensate the body fluid and blood losses due to haemorrhage different body fluids and hematinics such as iron, copper, cobalt, Vitamin-C, Vitamin B-complex is recommended. Otherwise there remains a possibility of haemorrhagic shock.
- **If haemorrhage does not stopped, it can cause following complications:**
 1. A haematoma (localized collection of blood outside the blood vessel) may be formed.
 2. Excessive bleeding may cause shock to animal.
 3. Tissue anoxia may occur due to haemorrhage.
 4. Bacterial growth- growth of bacteria will be more there.

Methods of controlling haemorrhage during Surgery

- Haemorrhage during surgery can be controlled in following ways:

1. Control before operation
2. Control during operation
3. Control after operation

CONTROL BEFORE OPERATION

Possibility of haemorrhage can be reduced in following ways:

- a) **By tourniquet:** A tourniquet is a cord tied around an extremity (like limb, tail); so as to control bleeding. A tourniquet is applied proximal to the bleeding point.
- b) **By Esmarch's bandage:** This method may be employed while doing operations on the limb or tail; to minimize bleeding. It is like tourniquet but instead of using string or bandage, rubber is used in it.
- c) **By Styptic agents:** Styptic are the agents which cause shrinkage of blood vessels. These are given with general anesthesia to animal before operation.

CONTROL DURING OPERATION

During operation haemorrhage can be controlled in following ways:

- a) **Thermo-cauterization:** It is used to stop bleeding during operation. A red hot iron applied to a bleeding point usually cause arrest of haemorrhage.
- b) **Ligation:** Ligation is the **best method** of stopping bleeding from vessel during operation.
- c) **Crushing:** Crushing small vessels can be done by using artery forceps or Burdizzo castrator. Applying artery forceps at the end of cut artery for a few minutes stops bleeding from small vessels. Spermatic cord is crushed with Burdizzo castrator due to which blood supply is closed fully.
- ✓ **Spermatic cord has following structures:** Spermatic Artery, Spermatic Vein, Vas Deferens, Spermatic Nerves, Muscles and Skin
- d) **Torsion:** Torsion may check bleeding from small blood vessels (by artery forceps).
- e) **Use of $KMnO_4$ Crystals:** $KMnO_4$ crystals are used to check bleeding; especially during the surgery of horn.

CONTROL AFTER OPERATION

After operation, bleeding due to any injury can be controlled in following ways:

- a) Pressure Bandage
- b) Cold water irrigation
- c) By using Tr. Ferric chloride
- d) Inj. Chromostat 20-40ml IM
- e) Tab. Chromostat 10 tablets b.i.d.
- f) Inj. Zakshot 20-40 ml IM
- g) Package/plugging of Wound – Apply the medicated plug in the wound and remove plug after 24 hours.

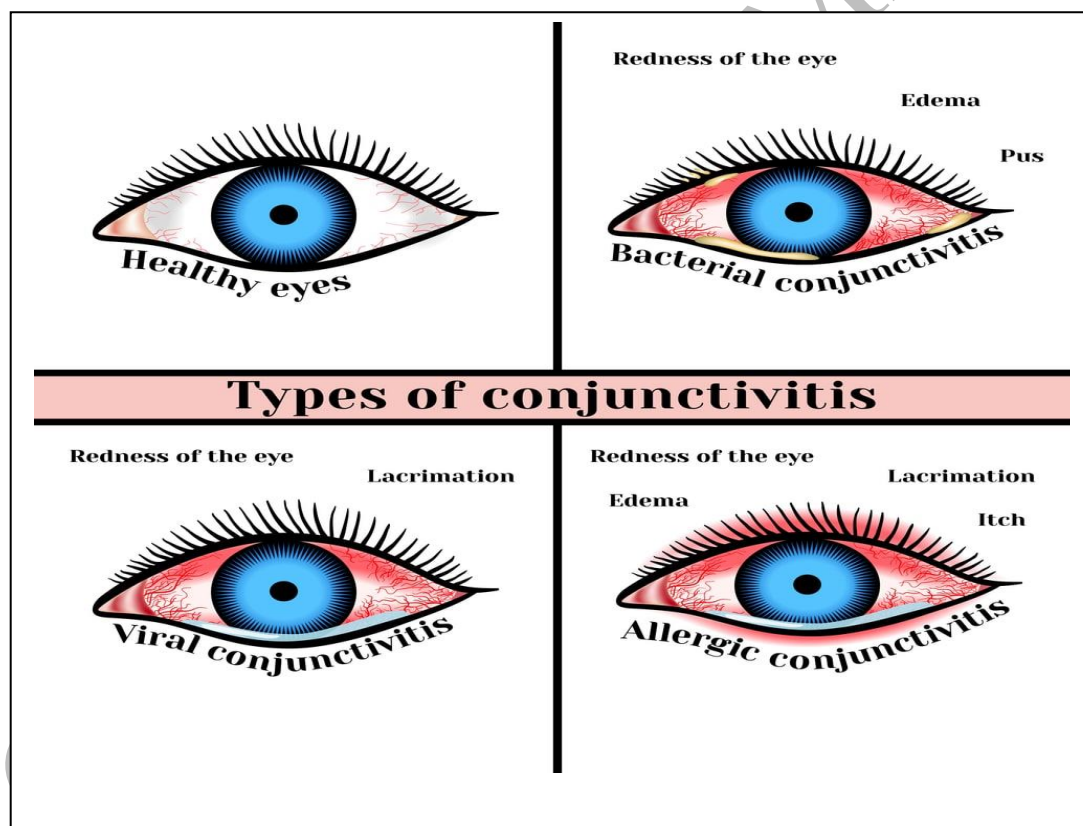
CHAPTER - 10

AFFECTIONS OF EYE

➤ **Affections of Eye** - The common affections of eye in domestic animals are -

1. Conjunctivitis
2. Dermoid
3. Corneal ulcer
4. Corneal opacity
5. Glaucoma
6. Staphyloma

1. Conjunctivitis: It is the inflammation of the conjunctiva. In the beginning stages of conjunctivitis, lacrimation is thin and watery. Later it becomes thicker and has a tendency to stick on to the edges of lids.



Treatment: If there is any foreign body in the eye, try to remove it.

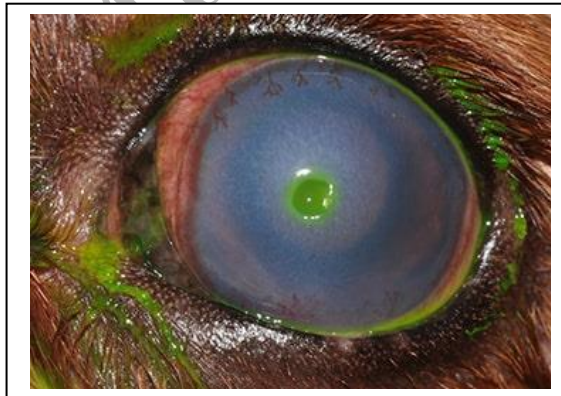
- Clean the eyes with NSS or 2% Boric acid. Pus should come out through washing.
- If NSS or Boric acid is not available then boil the clean water for 10 minutes and after cooling and adding some solution it can be used for cleaning.
- If pus does not come out after washing then 1-2% solution of CuSO_4 or silver nitrate is poured into the eyes for 20-25 minutes followed by cleaning of eyes with boric acid lotion.
- After proper cleaning, any antiseptic eye drop/e.g. Locula, Ciprofloxacin, Norfloxacin, Terramycin etc. is poured into the eyes.

- If the conjunctivitis is not cured after pouring these drops continuously for 5-6 days then Hydrocortisone-1ml and Penicillin-1 Lac IU Injections are given via subconjunctival route. These injections are given for 2-3 days. 99% of cases are cured by it. If still there is problem; then these injections can be repeated for alternatedays.
2. **Dermoid:** It is an embryological condition. Dermoid cyst usually contains hair growing on it and cause irritation of the conjunctiva and cornea. Its diagnosis is done on the basis of its symptoms.



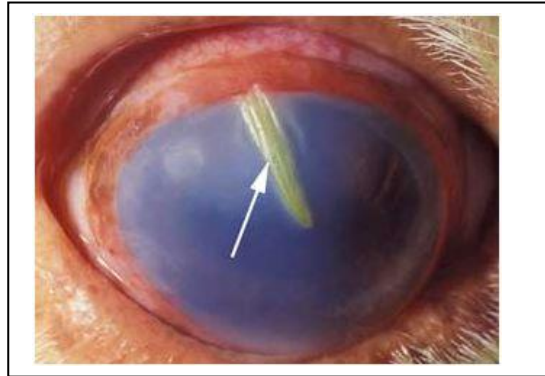
Treatment: Its growth is ligated after giving local anaesthesia. After ligation, its upper part is incised and ASD is done. It is washed with Boric acid and eye liniment is poured. If it is not cured after 3-4 days. Injections of Hydrocortisone and penicillin can be given.

3. **Corneal ulcer:** It is a condition in which there is cut or ulcer on cornea.



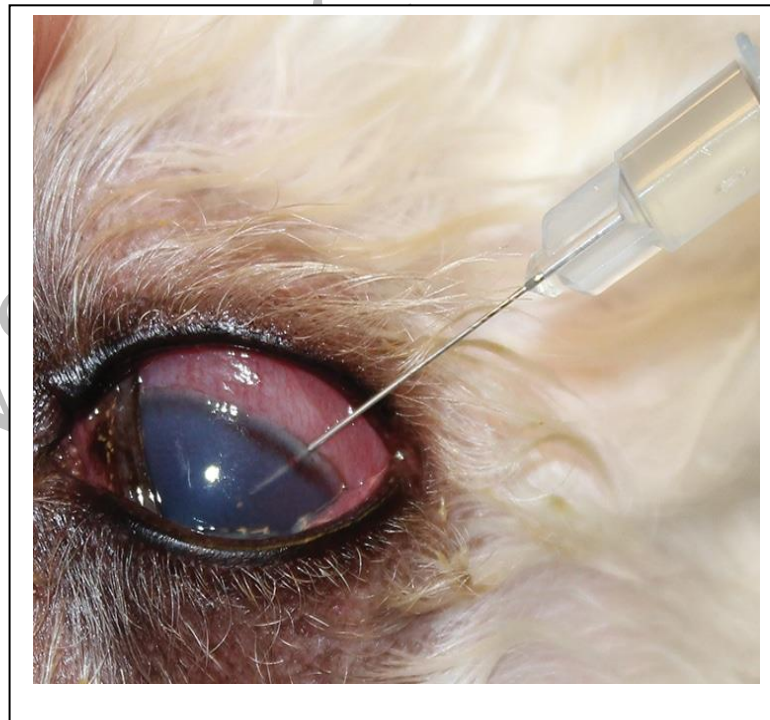
Treatment: It is treated as chronic conjunctivitis. CuSO_4 or silver nitrate is used.

- 4. Corneal Opacity:** It is a disease of cornea in which cornea becomes opaque due to which vision of animals is greatly reduced.



Treatment: Application of Hydrocortisone eye ointment after washing of eyes in combination with parenteral administration of injection Dexona - 1 ml and injection penicillin - 1 lac I.U.

- 5. Glaucoma:** It is a condition of increased pressure within the eyeball, causing gradual loss of sight. The increased intraocular pressure due to excessive accumulation of aqueous humour in anterior chamber will cause severe pain.



Treatment: Extra fluid present in anterior chamber is extracted by puncturing it followed by cleaning with boric acid and instillation of antiseptic eye-drop solution; till complete recovery. *Osmotic diuretics like Mannitol @ 1g/kg IV can also be given.

6. **Staphyloma:** It is an abnormal protrusion of iris through a weak point in the eyeball, (any wound or ulcer on the cornea) which cause leakage of aqueous humour resulting in severe pain.



Treatment: Iris is pushed back followed by antiseptic dressing with any eye-drop or eye ointment. Animal will fully recovers in 8 – 10 days if proper sterilization of eye is maintained.

CHAPTER - 11

AFFECTIONS OF HORN

➤ **Affection of Horn:** The common affections of horn in domestic animals are -

1. Broken Horn
2. Horn cracks
3. Horn cancer

1. Broken Horn: The horns of the animals get broken during fight, and cause bleeding. This condition is known as broken horn.



Treatment: Clean the site with any antiseptic solution e.g. savlon 1:100. If there is still bleeding; then dress the wound with Tr. Ferric chloride or Tr. Benzoin compound. After 1 or 2 days, dress the wound with any antiseptic powder (like Sulphonamide powder). If necessary then liquid paraffin can also be applied on the wound. When wound starts healing, then dressing is done with BIPP.

2. Horn cracks: It is a condition; in which horns get cracks and they bleed. Its treatment is also done with ASD if possible then uses those medicines which work as astringent.



3. Horn Cancer: It is a very common condition. The horns become shaky and fall off. A foul smelling discharge is noticed. When the horns fall off or are amputated the typical

cauliflower like growth are seen.



Treatment: Following treatment should be done -

- Dress the swelling with magnesium sulphate or liquid paraffin.
- Dressing is done with silver nitrate or CuSO_4 because these have caustic effect.
- Firing iron flat or firing iron point is heated red-hot and applied on the base of horn to cut the swelling.
- Swelling can be separated by ligation.
- A vaccine is also prepared but only for experimental animals.

➤ **Prevention:** By debudding

CHAPTER - 12

SUTURE MATERIALS AND TECHNIQUES

Sutures can be defined as artificial reduction, alignment and fixation of cut tissues by external support. The external support to wound is provided by different suture materials. An ideal suture material must possess certain qualities i.e. it must be free from bacteria, should be stable, should not have capillary action, must have sufficient coefficient of friction and less tissue reactive.

CLASSIFICATION OF SUTURE MATERIAL

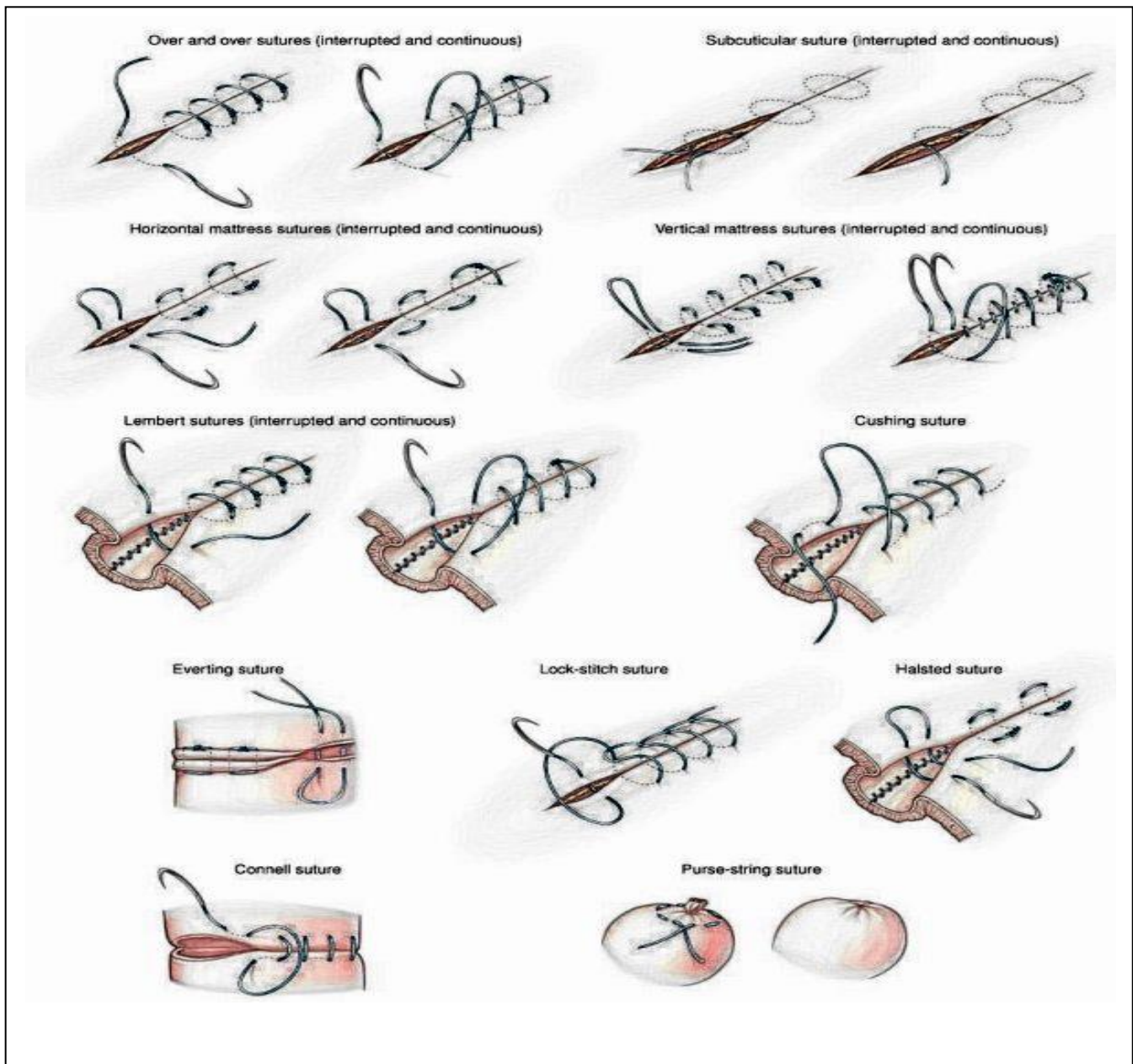
The suture material can be classified on the basis of their origin and on the basis of their absorbability.

A. On the basis of origin

1. **Animal origin:** Catgut, Silk, Collagen, Kangaroo tendon and wool
2. **Plant origin:** Cotton
3. **Synthetic:** Nylon, Teflon, Polyglycolic acid, polyglytin 910 and polydioxanone

B. On the basis of absorbability

1. **Absorbable:** These are absorbed into body tissue after a variable period of time.
e.g. Catgut, Collagen, Polyglycolic acid, Polyglytin 910 (Vicryl), Polydioxanone (Dexon)
 - ❖ **Catgut or Surgical gut:** It is most commonly used absorbable suture material in surgery. It is obtained from the sub-mucosa of small intestine of sheep and kid. Chromic acid treatment is done to delay the absorption time and to reduce irritation. The chromic catgut is of different categories i.e. A, B, C and D. The chromic catgut is usually get absorbed within 6 to 12 days, but if chromatization is of D category, then it can stay upto more than one month. Catgut is available in pasteurized aluminium foil containing 85% ethyl alcohol. It is used for suturing of soft tissues inside the body viz. muscles, mucosa and serosa.
 - 2. **Non-absorbable suture material:** These are those materials which does not get dissolved in the body tissue; hence they are removed after healing is complete. These include cotton, nylon, silk, linen, metal like stainless steel, aluminium.
 - ❖ **Silk:** It is most commonly used non-absorbable organic suture material. It is capillary, easily available, cheap, easy to handle and sterilize. It is available in various numbers from 0-14 depending upon size. It is preferred for herniorrhaphy due to its tension holding capacity.
 - There are different thickness and diameters of different suture materials ranging from 8/0 upto 5 (5 is the thickest). 8/0 to 6/0 are used for microsurgery. Suture material having no. 2, 3, 4 are used for large animal surgery, while suture material no. 1 is used for small animal surgery. Suture material no. 3 is routinely used for performing rumenotomy and caesarean section, while 3/0 is used for surgery of teat and urinary systems. The suture material with no. 1 is routinely used for surgery of canine and felines.
 - ❖ **Suturing Patterns:** They can be broadly classified as apposition and inversion sutures.



A. Apposition Sutures: These sutures are used to bring about apposition of wound on skin and muscle.

1. Continuous sutures : These are of three types -

- a) Simple continuous sutures
- b) Purse string sutures
- c) Continuous lock-stitch sutures

2. Interrupted sutures : These are of three types -

- a) Simple Interrupted sutures
- b) Mattress Interrupted suture – Horizontal mattress, Vertical mattress

c) Cruciate sutures

B. Inversion Sutures: These sutures are used to bring about inversion of wound edges and to bring them together. These are useful in suturing of hollow organs having serous layers like GIT and uterus. These sutures prevent leakage of contents of hollow organs. The serous layer has fast healing tendency when brought in apposition. These are of three types –

a) Cushing sutures

b) Connell sutures

c) Lambert sutures

❖ Suturing of muscles and internal organs is done with non cutting suturing needle while suturing of skin is done with cutting suturing needle.

CHAPTER - 13

INTRODUCTION OF POST OPERATIVE MANAGEMENT

- Postoperative care of the patient influences, to a greater extent, the outcome of surgery irrespective of the procedure being major or minor. Post operative complications can be minimized to a larger extent by monitoring the patients till complete recovery occurs.

ROUTINE CONSIDERATIONS DURING POSTOPERATIVE CARE

1. The animal should be closely observed during recovery from anaesthesia.
2. If surgery was done with the animal in spine position, the patient should be slowly shifted to the lateral recumbency.
3. Intravenous line should be maintained till complete recovery from anaesthesia so as not to waste time in venipuncture; if an emergency arise.
4. Respiratory stimulants should be avoided in case of barbiturate anaesthesia.
5. In case cranial epidural block is used for surgery, enough time should be allowed for the local anaesthetic effect to disappear before the animal is made to stand with support to avoid a sudden fall.
6. Limbs should be massaged to promote circulation following a prolonged recumbency period.
7. Laboratory tests in the postoperative period are indicated on the basis of preoperative status of the patient. If the surgery was done to correct life threatening disorders e.g. pericarditis, ruptured urinary bladder, intestinal obstruction, diaphragmatic hernia etc. or the patient was dehydrated or anaemic, laboratory tests should be used as a screening measure.
8. In uraemic patients, serial determinations of plasma concentrations of creatinine and urea nitrogen help to evaluate the efficacy of the treatment provided.
9. Serial determination of haemoglobin and packed cell volume is of value in anaemic patients and also to judge hydration status in cattle. High values of packed cell volume usually indicate dehydration. However, this does not hold true in camels and buffaloes. The status of skin elasticity provides a better indication of dehydration in these animals.
10. Total leucocytic count along with differential leucocytic count reflects the extent of stress, inflammation or bacterial infection and the load of reticulo-endothelial system. Neutrophilia with appearance of band neutrophils and presence of eosinophils suggest mild infection or mild stress. A relative lymphopenia and an absolute eosinopenia alongwith Neutrophilia indicate severe infection or severe stress.
 - ✓ Localized infection and formation of pus lead to marked neutrophilia. Neutrophilia is also associated with many non infectious diseases e.g. malignancy, chemical intoxication, metabolic intoxication (e.g. uraemia) and haemorrhage. Neutrophilia also develops as a consequence of surgical trauma.
 - ✓ An extremely high leucocytic count is not a favourable sign.
 - ✓ Leucopenia may occur as a result of viral or massive bacterial infection.
 - ✓ Monocytosis indicates chronic infection while eosinophilia is usually a result of antigen-antibody reaction.
11. Urine analysis in the postoperative period is not a routine practice in ruminants. However, the analysis for specific gravity, protein concentration and presence of casts or ketone bodies may serve as a useful indicator in many instances.

12. In India, development of metabolic acidosis is not a routine problem in surgical cases because of high green or roughage and low concentrate ration in the feed. Therefore, sodium bicarbonate solutions should be used with caution and only if diagnosis of metabolic acidosis has been established with the aid of laboratory tests.
13. Among electrolytic deficits, plasma concentration of chloride and potassium need consideration, especially in diseases related to the upper digestive system. Hyponatraemia occurs rarely in ruminants following surgical disorders.
14. Daily inspection of the surgical wound should be a routine.
 - ✓ Dressing with alcohol, two times a day, is usually sufficient if the surgical site does not come in direct contact with soil or other contaminating material.
 - ✓ However, if the surgery site is predisposed to contamination (e.g. ventrally placed incision), then bandaging and a daily change is recommended.
15. In tropical climate, when the weather conditions are hot and humid, use of fly replants should be considered to avoid maggot infestation.
16. Usually, a prophylactic course of broad spectrum antibiotics is recommended for 3-5 postoperative days to prevent bacterial contamination.
17. Following major surgery, analgesics should be used for at least 3 days to reduce pain.

CHAPTER - 14

APPLICATION AND USES OF VARIOUS ANTISEPTICS, LOTIONS, OINTMENTS AND TINCTURES IN SURGICAL PRACTICE**A. COMMON ANTISEPTICS USED IN SURGICAL PRACTICE**

- 1. Boric acid:** It has antiseptic and desiccant action. It is used to treat conjunctivitis and cracked teats.
- 2. Potassium permanganate:** It has antiseptic, disinfectant and caustic action. It is used as footbath, to wash FMD lesions and animal sheds. It can also be used in treatment of bleeding wounds.
- 3. Hydrogen peroxide:** It has antiseptic action. It is used as a solution to clean and deodorize wounds and ulcers.
- 4. Ethanol:** It has antiseptic action. It is referred as surgical spirit. It is used to disinfectant the skin before injections are given.
- 5. Povidone iodine:** It is an antiseptic used for skin disinfection before (scrubbing) and after surgery.
- 6. Savlon:** It has antiseptic action. It is used for scrubbing of surgical site and also to disinfect the hands of the surgeon.
- 7. Silver nitrate:** It has caustic action. It is used for removing warts and granulation tissue and for cauterizing wounds and ulcerations.
- 8. Zinc sulphate:** It has antiseptic action. It is used in making of ZIPP that is commonly used in antiseptic dressing for faster wound healing.
- 9. Acriflavin:** Acriflavine is a topical antiseptic, mainly used for minor wounds, burns and infected skin.

B. COMMON LOTIONS USED IN SURGICAL PRACTICE

- 1. Calamine lotion:** It is used to relieve pain, itching and discomfort from minor skin irritations. It is also used to dry the oozing and weeping caused by irritation.
- 2. White lotion:** It has sedative, refrigerant and analgesic action. It is used topically on sprained tendons and muscles, and to treat various inflammatory conditions of skin.
- 3. Boric acid lotion:** Boric acid has mild antibiotic properties against fungal or bacterial infection. Boric acid eye lotion is used to cleanse or irrigate the eyes. Boric acid provides soothing relief from eye irritation.

C. COMMON OINTMENTS USED IN SURGICAL PRACTICE

1. **Iodine ointment:** It has counter irritant action and it is used in treatment of swelling, sprains, contusion, fibrous wound surface
2. **Zinc oxide ointment:** It has antiseptic action and used in treatment of superficial wounds and ulcers.

D. COMMON TINCTURES USED IN SURGICAL PRACTICE

1. **Tincture Benzoin complex:** It has haemostatic and antiseptic action. It is used to check haemorrhage from bleeding wounds.
2. **Tincture Ferric chloride:** It has antiseptic and styptic action. It is used as local haemostatic for controlling haemorrhage from bleeding wounds.
3. **Tincture of Iodine:** It has antiseptic action. It is used to disinfect wounds.

CHAPTER - 15
SOME COMMON SURGICAL CONDITIONS
AFFECTIONS OF JOINTS

➤ **Affections of joints:** Affections of joints are of two types -

1. Arthritis
2. Sprain

1. **Arthritis:** Inflammation of joints is termed as arthritis. Due to inflammation, there will be swelling and the animal feels pain. After sometimes fluid accumulates in it, it is termed as 'Hygroma'.

❖ **Hygroma** – An accumulation of fluid in a sac, cyst or bursa.

Treatment: Injection of hydrocortisone is very useful in treating arthritis. Injection Hydrocortisone (2 ml) mixed with Penicillin (4.5 lac IU) is given intra-articular.

2. **Sprain:** A sprain is twisting, stretching or tearing of ligaments of joints violently so as to cause pain and swelling but not dislocation. A sprain may be caused due to slipping or falling.

Treatment: If the case comes before 48 hours, then it is cured by cold application. Cold water or lead lotion is used for it. Cotton dipped in lead lotion is bandaged on that spot, lead lotion are poured again and again to keep that spot cool.

If the case comes after 48 hours, then it is cured by hot application. Iodex, iodine ointment, T.T. oil or camphor liniment is applied on the spot.

DISLOCATION

Aetiology	1. Trauma/injury
Symptoms	<ol style="list-style-type: none"> 1. Pain 2. Deformity 3. Immobility of affected joint 4. Shortening or apparent lengthening of limb 5. Radiography for diagnosis.
Treatment	<ol style="list-style-type: none"> 1. Reduction and extension 2. Anti-inflammatory 3. Analgesics

DEHORNING/DEBUDDING

- Dehorning means removal of the horn either in normal state or diseased conditions.
- Dehorning is required to make the animal docile. In large animals, the horn can be affected with cancerous growth resulting in death of the animal. Although, horns are the main organs of defense in wild animals, but in domesticated animals, it can injure its own calf or the owner. Therefore, it is considered necessary in productive animal to remove its horn so that its maximum energy is utilized for production and reproduction, both. In some animals, the

horns are thick and overgrown resulting in pressing of underlying skin and other tissues. In these cases, due to constant pressing by the horn the wound become very deep and can be infested with maggots, becoming a constant source of irritation. In such cases also partial removal of the overgrown horn is required.

- For removal of the horn either cornual or ring block is required because the core of the horn is richly supplied by both nerves and blood vessels. After achieving proper analgesia, the horn is amputated from its base. In small calf, local infiltration is sufficient to remove the bud of the horn. In a new born calf, the debudding/dehorning is required within a week after birth. In cross bred calf the body temperature is also checked to rule out any blood protozoan infection and to avoid side effects of the hot debudder.
- In adult animal, the horn is amputated from its base using obstetrical wire or electric saw. The bleeding is checked either by hot iron or burn by potassium permanganate crystals. Bleeding from small capillaries can be checked by local hemostat e.g. alum, tinc. Benzoin complex, tinc. Ferric chloride. If possible, after amputation the frontal sinus should be covered by overlying skin to avoid sinusitis. Postoperatively, the amputated horn should be dressed daily with povidone iodine, ZIPP or BIPP till its complete recovery.
- In overgrown horn, the horn is cut usually from the first whirl towards the tip of the horn, using obstetrical wire or saw. In those cases where thick base used to press the underlying skin and tissue, in those cases only this pressed portion of the horn is cut transversely using obstetrical wire or saw, taking care of internal core of the horn should not be exposed.
- In calves the debudder is used for removal of the bud of both sides. Postoperatively, any antiseptic fly repellent cream is applied till its complete healing. In small calves, the usual time of wound healing is 2 to 3 weeks. Postoperatively a full course of anti inflammatory and antibiotics should be given in both small and adult animals.

TAIL DOCKING

- Docking of the tail is a routine operation in farm animals. Although, the tail is considered very useful for cleaning and protecting the body parts, but sometimes, due to irreparable injuries and in accidental cases, the tail get so much injured that its amputation is required. In some cases, as cosmetic measures also its amputation is done. In some disease conditions also, such as gangrene and necrosis, tail amputation is required.

- For tail docking, routinely, two methods are adopted:-

1. By Docking Knife

2. By Flap Method

- For these two methods, firstly, caudal analgesia (epidural block) is done followed by application of rubber tourniquet at the base of tail to control the bleeding. The exact site of the amputation depends upon the site of damage/injury/necrosis/gangrene. Just above the affected portion of the tail, docking is done at the healthy portion in between two coccygeal vertebrae. After feeling the inter-vertebral space either by docking knife or by flap method amputation is done. The use of docking knife to cut the tail in between two coccygeal vertebrae is a primitive method. By this method, hemorrhage from the cut tail is usually controlled by the use of firing.

- Now a days, usually, amputation is done by flap method. After deciding the site of docking, a skin flap is made by reflecting the skin. The underline vessel i.e. two lateral coccygeal veins and one ventral coccygeal artery are ligated and the tail is disarticulated in between the two coccygeal vertebrae. The overlying flap of muscles is closed by using chromic catgut no. 3 in a lockstitch pattern and skin by using silk with interrupted horizontal mattress. A post operative care of daily antiseptic dressing along with antibiotic and anti-inflammatory course is done for proper wound healing at the site of amputation.

UPWARD LUXATION OF PATELLA/ STRINGHALT

This condition is found mainly in working cattle. In this disease, medial patellar ligament of hind limb shrinks, due to which the animal walks with a jerk. Lameness improves if the animal walks for a longer time, but exaggerates after a period of rest.

Aetiology	Unknown (Plant poisoning)
Symptoms	<ol style="list-style-type: none"> 1. Jerky flexion or dragging of affected limb 2. Marked lameness initially
Treatment	Medial patellar desmotomy

TRAUMATIC RETICULO-PERITONITIS (TRP)

Aetiology	<ol style="list-style-type: none"> 1. Ingestion of pointed metallic objects. 2. Common in bovine.
Symptoms	<ol style="list-style-type: none"> 1. History of pica. 2. Recurrent tympany of rumen impaction not responding to conservative treatment. 3. Fever, stiff gait, abducted elbows, arched back. 4. Hematology 5. Neutrophilia 6. X-ray exam for diagnosis.
Treatment	1. Rumenotomy

URINARY CALCULI

Aetiology	<ol style="list-style-type: none"> 1. Vitamin A deficiency 2. Urinary tract infection 3. Hard salty water
Symptoms	<ol style="list-style-type: none"> 1. Anuria or dysuria, Straining for urination, colic 2. Per- rectal examination reveals distended bladder
Treatment	<ol style="list-style-type: none"> 1. Urethrotomy for removal of calculi 2. Catheterization of urethra

YOKE GALL

Aetiology	<ol style="list-style-type: none"> 1. Rough yoke 2. Unpaired bullock 3. Hard work 4. Overloading
Symptoms	1. Painful, swelling over neck which may contain exudate followed by pus(abscess) and fibrous tissue formation (induration)
Treatment	<ol style="list-style-type: none"> 1. Complete rest 2. Anti-inflammatory drugs and antibiotics 3. Massage with iodine ointment. 4. Hot fomentation 5. Drainage of pus

**OESOPHAGEAL OBSTRUCTION (CHOKE)**

Aetiology	<ol style="list-style-type: none"> 1. Food material : Potato, Beet, Mango Seed, Apple, Water Melon 2. Foreign body : Stone, Piece Of Wood, Leather, Plastic, Polythene, Metal
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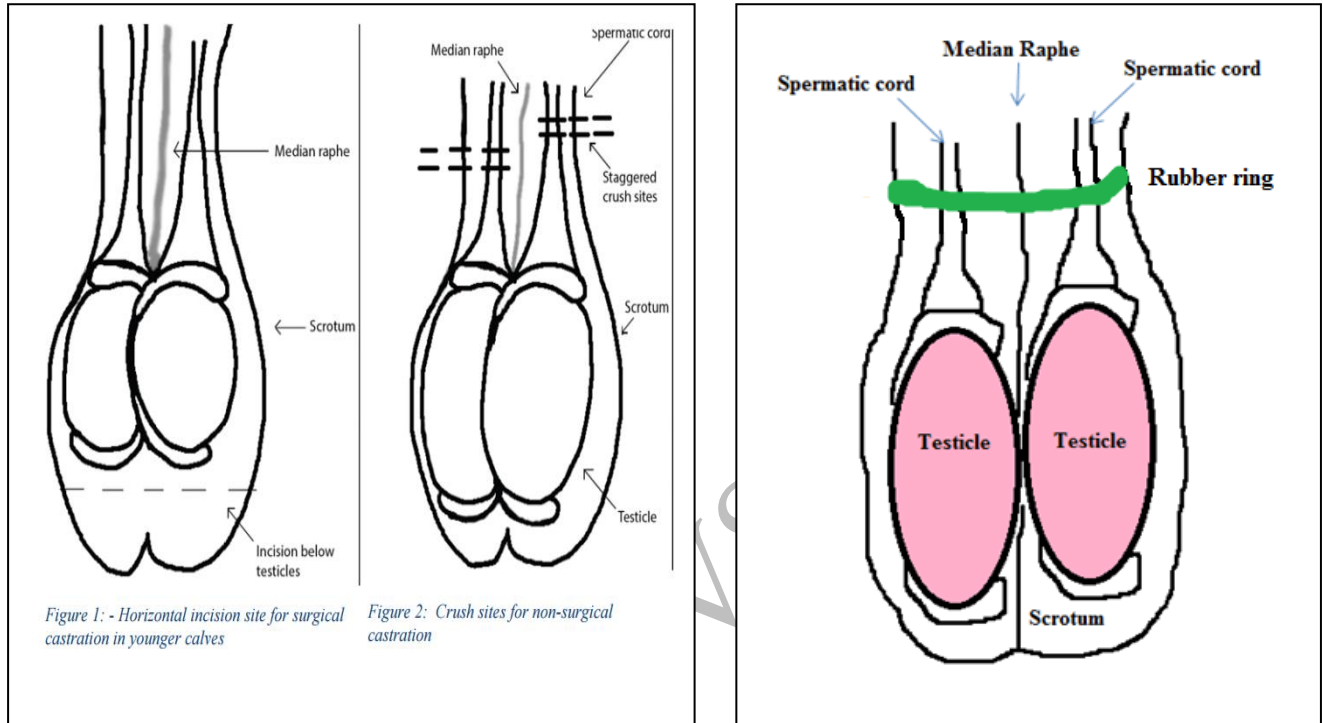
Symptoms	<ol style="list-style-type: none"> 1. Swelling and pain on palpation of oesophagus in ventral neck region. 2. Profuse salivation, inability to swallow. 3. Coughing Regurgitation of water after drinking. 4. Acute tympany in complete obstruction. 5. Failure to pass stomach tube and contrast radiography to locate the obstruction in thoracic part. 6. Common in bovines.
Treatment	<ol style="list-style-type: none"> 1. Trocarisation of rumen. 2. Antispasmodics. 3. Attempts to remove obstructed material through mouth or dislodge in the rumen. 4. Oesophagotomy for obstruction in cervical region. 5. Rumenotomy if obstruction is near cardia.

OEDEMA

Aetiology	<ol style="list-style-type: none"> 1. Fibrosis of liver 2. Cardiac failure 3. Renal failure 4. Parasites 5. Protein deficiency
Symptoms	<ol style="list-style-type: none"> 1. Soft, painless doughy swelling which pits on pressure 2. Anaemia 3. Hypoproteinaemia 4. Facial examination
Treatment	<ol style="list-style-type: none"> 1. Rest and salt free diet 2. Protein supplement 3. Anthelmintics 4. Ectoparasiticides 5. Liver tonics 6. Diuretics

CASTRATION

- Castration means disconnection of spermatic cord, making the animal unfit for both libido and breeding. However, in vasectomy, only the vas deferens is disconnected making the animal only unfit for reproduction, but maintaining its libido.
- There are two methods of castration – Open method and Closed method.



- In cases of cattle, the castration is advised prior to puberty (earlier is the better, but sufficient time should be given for body growth). Keeping in view the temperament of male cattle, the animal is sedated using tranquilizer (Siquil or Xylazine). After sedation the animal is restrained in right lateral recumbency. The animal is controlled in such a way that its entire testicular area is properly exposed.
- By closed method, which is routine in practice usually Burdizzo castrator is used. For application of Burdizzo castrator over the spermatic cord over the testicles, the area is properly secured and an antiseptic solution is applied. After putting some padding material viz. cotton gauge, the spermatic cord is placed in between the jaw of the Burdizzo castrator. For proper placement of Burdizzo castrator over the spermatic cord, usually one testicle is pushed upward so that sufficient space is available. The Burdizzo castrator is pressed and kept pressing for at least 5 minutes at the same place. The same procedure should be applied at two to three sites over the spermatic cord. The same procedure should be repeated for second testicle in the same manner, making sure that both spermatic cords are disconnected from the testicles. At the site of application of Burdizzo castrator, an antiseptic solution such as tincture iodine, acriflavin, povidone iodine, mercurio-chrome is applied. The closed method of application of Burdizzo castrator is usually successful at a particular age. The main precautions kept in mind, while applying burdizzo castrator is not to injure either penis or testis, only spermatic cord should be carefully pressed.

➤ If the cattle crosses a particular age and its spermatic cord is thick, then castration is done by removal of testicles itself. This method of removal of testicles by surgical intervention is known as open method. For the open method, the animal is kept off- feed and off-water for at least 24 hours. The cattle is sedated with xylazine or chloral hydras. After proper controlling in right lateral recumbency and proper restraining the local infiltration can be done towards the lateral side of the scrotum above the testicles, if it is required. An incision is given on lateral side of scrotum to expose the testicles. The outer covering of testicles, tunica albuginea is incised to expose the spermatic cord and testicles. The spermatic cord is double ligated at two places and transfixed properly using either chromic catgut or silk no 3. Then spermatic cord is cut to remove the testicles, making sure that there should be not any bleeding. Same procedure is repeated on other testicle also. The incised wound over the scrotum should not be closed, but kept open to prevent edema formation due to accumulation of fluid. A full course of antibiotic and anti-inflammatory drugs should also be given. Light exercise, daily antiseptic dressing is advised till its complete healing.

CHAPTER – 16

ANAESTHESIOLOGY

Anaesthesiology : is a science of administering anaesthesia. The medicines that are used for it, are called Anaesthetic Agents. And Anaesthesia is a term used to indicate production of insensitivity.

Anaesthesia is classified into three types:

1. Local Anaesthesia**2. Regional Anaesthesia****3. General Anaesthesia**

1. **Local Anaesthesia:** it is a condition in which a small part of body of desensitized. According to modern terminology, drugs used for this purpose are called local analgesics eg. Procaine HCL 2% - 4% and Lignocaine HCL 2% - 3% and Xylocaine HCL 2% to 5% etc. For a small operation, the solution of lignocaine or procaine HCL 2% is given as per S/C.
2. **Regional Anaesthesia:** It is a condition in which a large part of body is desensitized. Generally, this anaesthesia is given in tail docking, Rumenotomy, eye surgery and Horn disease. To block the nerve, local anaesthetic agents 2% are applied around the nerve. Epidural Anaesthesia in Tail docking and Para Vertibral Anaesthesia in Rumenotomy is given. Auriculo Palpebral Anaesthesia is given in Horn disease. These all are termed as Regional Anaesthesia and 2% solution of Local Anaesthesia Agents is given in the base of nerve. So, by giving local anaesthetic agents that area can be desensitized for ($2\frac{1}{2}$ - 3 hours).
3. **General Anaesthesia:** in this Anaesthesia, full body of animal is desensitized. It is done by two ways:
 1. By Inhalation
 2. By Injections.
 1. By Inhalation: these are the drugs that are administered by inhalation e.g. ether, chloroform Nitrous, oxide etc.
 2. By injections: in it, general anaesthetic agents are given in the form of injections as per I/v e.g.
 1. Chloral hydrate.
 2. Thiopentone sodium or pentothal sodium
 3. Ketamine HCL
 4. Chloral hydrate and Magnesium sulphate
 1. Chloral hydrate : Magnesium sulphate pentoabiten.

Chloral hydrate	: 28gm
Mag sulph	: 14"
Pentobarbitone sodium	: 6.5"
Distt. Water	: 1000ml

Dose : Horse – 670ml /400kg b.w.t. I/v

 - Pentothal (Thiopental Sodium for Injection, USP) is a Thiobarbiturate, the sulfur analogue of sodium pentobarbital. It is general anesthesia like Ketamine.
 - Xylazine was the first α_2 – agonist sedative to be widely used in veterinary medicine. Xylazine, 0.5- 2.2 mg/kg, IM will produce dose – dependent sedation.
 - Dose of ketamine – 10 mg/kg.

CHAPTER – 17

HERNIA**HERNIA**

Hernia: it is a condition in which any part of Abdominal cavity leaves its real place and comes under skin because of any normal or Accidental opening and swelling comes there. It is termed as Hernia.

Etiology : **1. Pre-disposing causes.**

2. Exciting Causes

1. Pre-disposing causes : if some abscess or wound occurs on peritoneum or Abdominal muscle then there becomes an opening from peritoneum or muscle. This opening from peritoneum or muscle. This opening from pressure increases in Abdominal cavity because of Tympany and impaction. Due to which, peritoneum or muscles become weak and burst.

This can cause Hernia.

2. Exciting causes : it is the main reason of Hernia. Peritoneum or muscles burst due to falling on a blunt object and there becomes an opening. Abdominal contents come out through this opening. It is termed as Hernia.

Part of Hernia: It has three main parts.

1. Opening of Hernia
2. Hernia contents
3. Hernial Swelling.

Symptoms

1. By palpating, three parts of Hernia will be felt.

Types of Hernia: It is of two types.

1. External abdominal Hernia
 2. Internal Abdominal Hernia
1. External Abdominal Hernia
 - a. Umbilical hernia
 - b. Scrotal hernia
 - c. Perineal hernia
 - d. Crural hernia
 - e. Ventral hernia

1. **Umbilical Hernia:** In it, Abdominal contents come out from umbilical opening.
2. **Scrotal Hernia:** When part of Intestine comes in scrotum then it is termed as serotal Hernia.
3. **Perineal Hernia :** In it, hernia contents come at the place of Perineum.
4. **Crural Hernia:** in it, hernia, contents come between the two rear legs.
5. **Ventral Hernia:** Accidental opening in Abdominal wall.
2. **Internal Abdominal Hernia:** In it, swelling is not seen from outside. This condition occurs mainly in buffaloes because they mostly do non-selective feeding due to which any sharp object stuck in Reticulum.

The structure of Reticulum is like honey comb from inside. The stuck foreign body in Reticulum moves towards diaphragm and does a small hole in it and gradually this opening becomes bigger due to which reticulum comes in Abdominal cavity. It is termed as Reticulum hernia of diaphragmatic hernia.

Diagnosis of Hernia: the diagnosis of External Abdominal hernia is done on the basis of clinical symptoms. This swelling is diagnosed differently from Abscess or Tumour.

2. In Internal Abdominal Hernia, there are some symptoms through which we can know

about the D.H. e.g. In the case of D.H.,

- (i) Complete Anorexia occurs
- (ii) there is possibility of Recurrent Tympany –

If it is treated, then this tympany can be cured only for a short period. It recurs after some days. This stage is found in buffaloes at the last stage of pregnancy or after parturition. To confirm it, X-ray is done, X-ray shows clear opening of diaphragm. If there is any foreign body in Reticulum then it will be seen clearly.

MRCVS MRCVS MRCVS