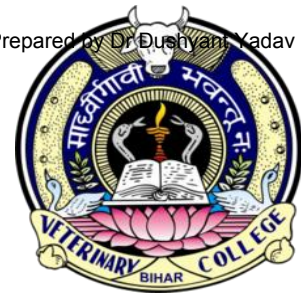




Prepared by Dr. Dushyant Yadav



CESAREAN SECTION

Prepared by-

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LAPAROHYSTEROTOMY (CESAREAN SECTION)

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"Cesarean section is the **delivery of the fetus by laprohysterotomy**"

or

"Cesarean section is an option for treating the dystocia when vaginal delivery would be unsafe for the dam or fetus, and fetotomy is not viable"



Indication of Cesarean Section

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- ✓ Feto-pelvis disproportion
- ✓ Fetal **mal-dissposition** which is not corrected by mutation or fetotomy
- ✓ Incurable uterine torsion
- ✓ Incomplete dilation of cervix
- ✓ **Fetal monstrosity** not corrected by other means
- ✓ Uterine rupture
- ✓ Damaged vaginal prolapse
- ✓ Anasarca
- ✓ Surgical termination of prolonged gestation
- ✓ To **terminate the pregnancy** in life threatening diseases
- ✓ Fetal mummification and hydrops uteri etc.



Prognosis of Cesarean Section

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Depends on several factors:---

- Skill and speed of the surgeon
- Duration of dystocia
- Physical condition of the dam
- Availability of skilled assistance
- Surgical environment
- Concurrent disease
- Presence of a Live Calf etc.



Pre-requisite of Cesarean Section

Restraint, preparation for surgery and anaesthesia

Restraint-

The options of patient positioning for caesarean operation are:-

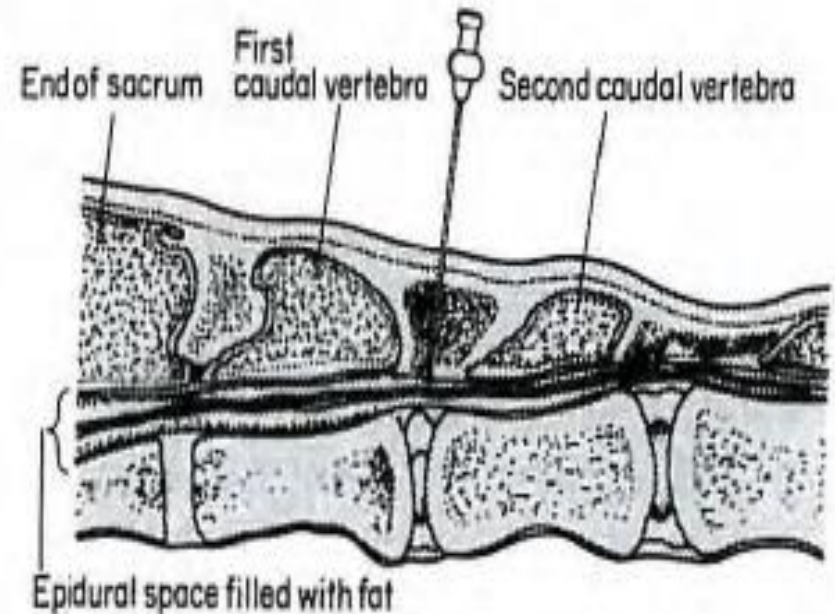
- **Standing-** suitable for left or right paralumbar fossa and lateral oblique approach
- **Dorsal recumbency-** suitable for ventral midline and paramedian approach
- **Sternal recumbency-** suitable for left or right paralumbar fossa
- **Lateral recumbency-** suitable for ventrolateral and low-flank approach



Sedation-

- Sedation **should be avoided** if possible
- If necessary
 - **xylazine** is commonly used
 - **i/m** or a **reduced dose i/v** (0.05-0.1 mg/kg)

- ✓ Preoperative **antibiosis**
- ✓ **Tocolytic agents**, such as isoxsuprine lactate (220-250 mg)
- ✓ A low **epidural injection** with 4-5 ml of 2% lidocaine
- ✓ **Repel the fetus** back into the relaxed uterus





A wide surgical field should be prepared

- Dirt and dust should be brushed
- operative field -clipped or shaved
 - In flank incision- transverse processes to mid vein and from last rib to tuber coxae
- Surgical scrub- 7.5% povidone-iodine or 4% chlorhexidine gluconate solution followed by surgical spirit
- Sterile drapes should be applied etc.



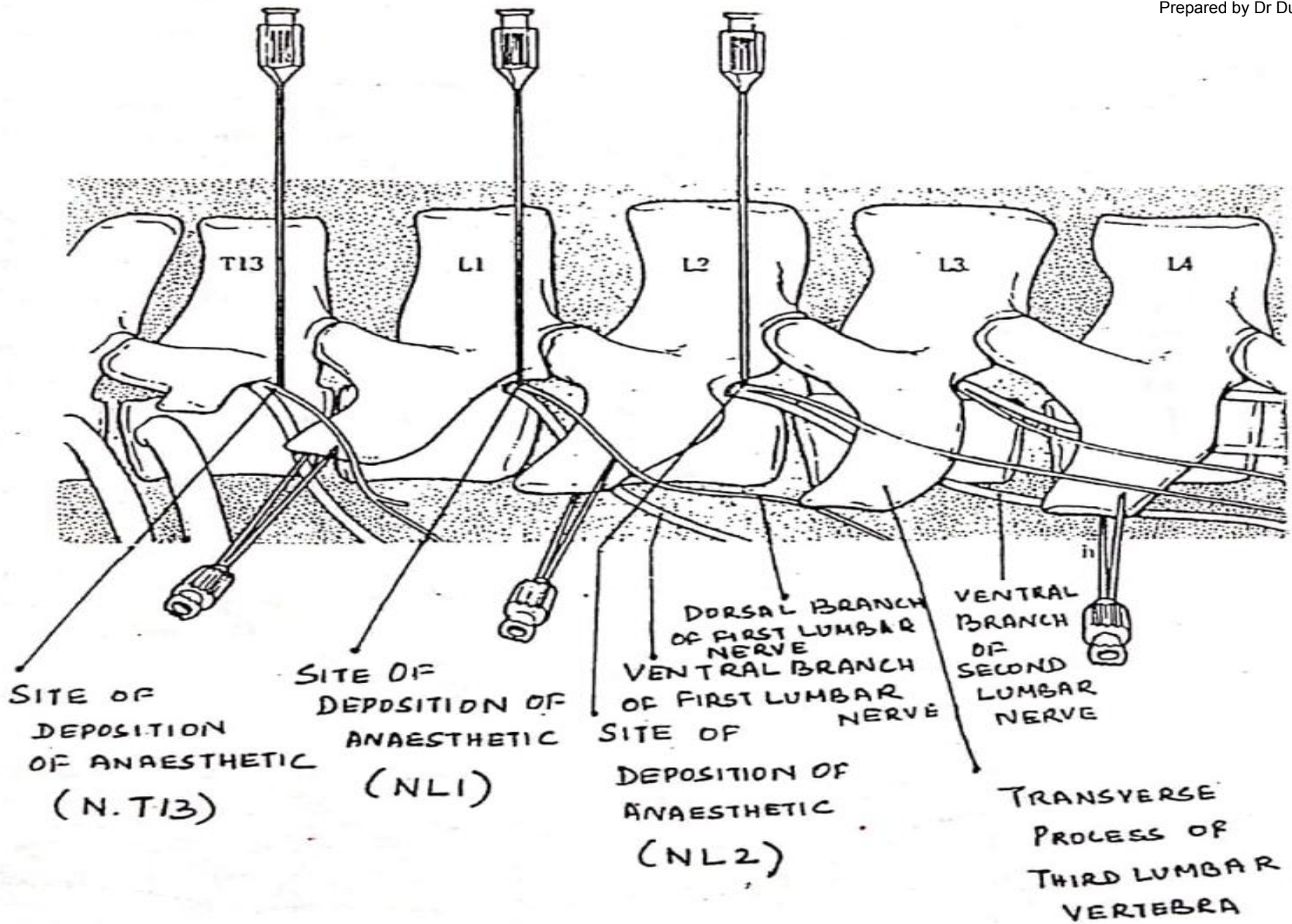
Anaesthesia

Varies between surgeons and the selected surgical site

For flank incisions----

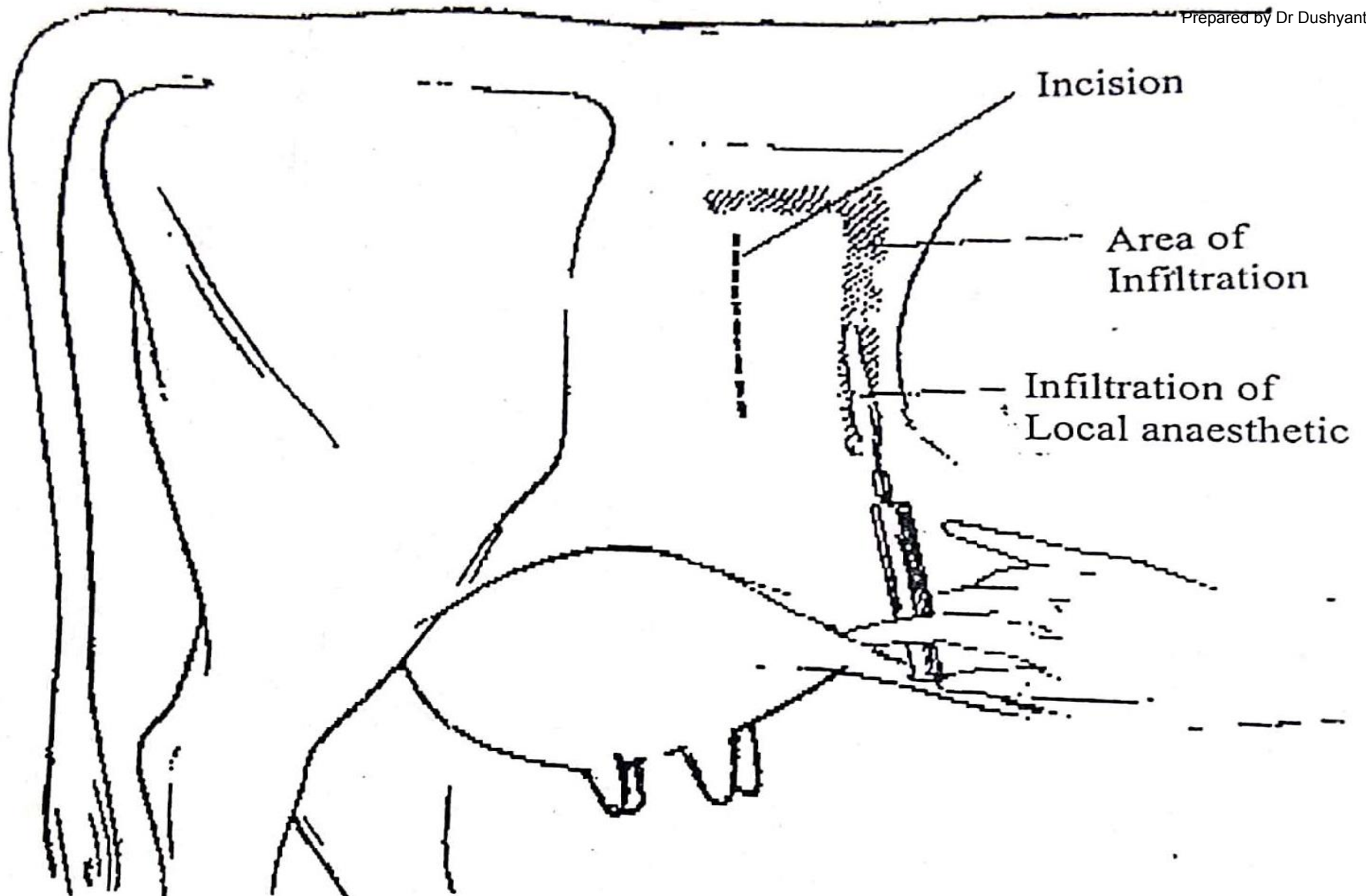
- Paravertebral anaesthesia-

- **Associated nerves-** transverse processes of **T13, L1, L2** and **L3**
- Each site is infused with 20 ml of a 2-3% lidocaine solution
- around 10-15 ml to block the ventral nerve branches, 5-10 ml for the dorsal branches



Paravertebral Nerve Block

- Line block or inverted-L block-
 - alternative to paravertebral anaesthesia
 - An 18-gauge x 1.5-inch needle is used to administer **2% lidocaine hydrochloride at several sites**
 - At **each point, 5 ml subcutaneously** in each direction of the incision line and **10 ml into the musculature**
 - About **80-100 ml (total)** of lidocaine is required



Inverted 'L'- Block



Selection of Surgical Sites

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➤ **Left Paralumbar fossa approach**

- most common for the standing animals
- incision site-middle of left flank starting 10 cm ventral to transverse process extending 30-40 cm long

➤ **Right Paralumbar fossa approach (Uncommon)**

➤ **Lateral oblique approach (Alternative to Left Paralumbar)**

- 30 degree from vertical
- About 10 cm cranial and 10 cm ventral to tuber coxae extending cranio-ventral upto 3 cm caudal to last rib

➤ **Ventrolateral approach (commonly on the left side)**

- mostly used when emphysematous fetus
- oblique incision in the lower flank starting from the flank fold parallel to the ventral border of last rib (imaginary lines between stifle joint to naval)



➤ **Ventral midline or Paramedian approach**

- not commonly used due to general anaesthesia or heavy sedation is required

➤ **Low flank approach** (Mostly in **left lateral recumbency**)

- Incision- approximately 15 cm below the transverse processes of the lumbar vertebrae, extending down to just above the milk vein

Note: Usually ---

- **Paralumbar fossa** and **lateral oblique** approach-**standing position**;
- all other techniques- recumbency

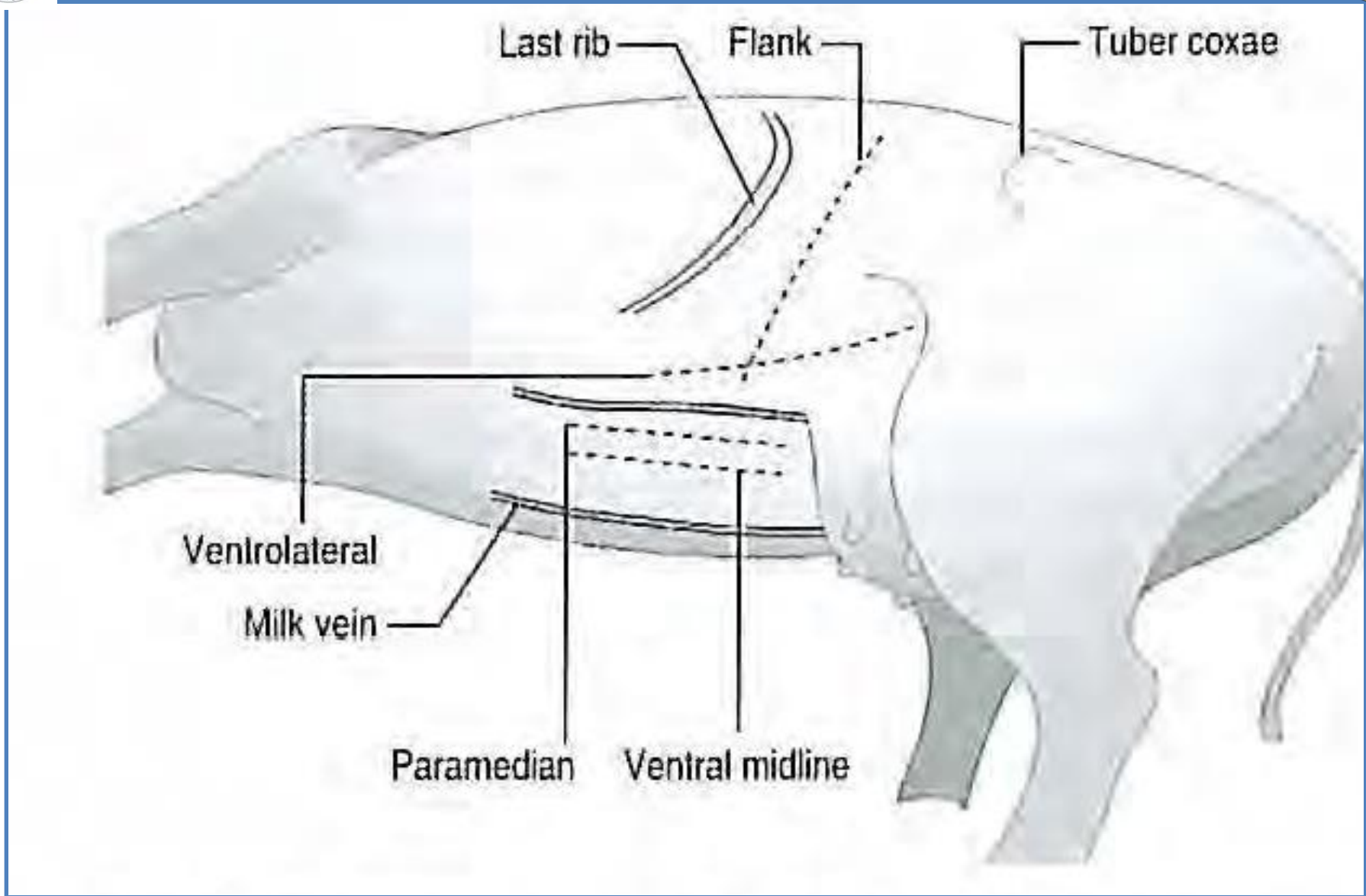


Fig: Sites of C-section



Procedure (Left Paralumbar Fossa approach)---

- Prepare the site
- Infiltrate the local **anaesthetic** agent
- **Skin incision** of about 10-12 inches
- **Incise** the external & internal oblique and transverse abdominus **muscle** with blunt incision
- Incise the peritoneum
- Omentum may be incise or pushed cranially
- **Identify the gravid horn**
- Incise the uterus on **greater curvature**
- **Remove the fetus** by lateral and caudal traction or by appropriate methods
- **Remove the fetal membrane** if easily removed

- Place the intrauterine antibiotic bolus
- Close the incise **uterus** by **double row lembert** or **cushuing suture** pattern with no 2 or 3 chromic catgut or Vicryl
- Close the omentum with no 2 chromic catgut
- **Peritonium** is closed with **continuous suture** pattern with no 2 chromic catgut
- **Abdominal muscles** are sutured with no 2 or 3 chromic catgut by **continuous lock or horizontal interrupted mattress** suture
- Close the **skin incision** by **simple interrupted or cross mattress or horizontal mattress** using nylon or cotton or silk sutures

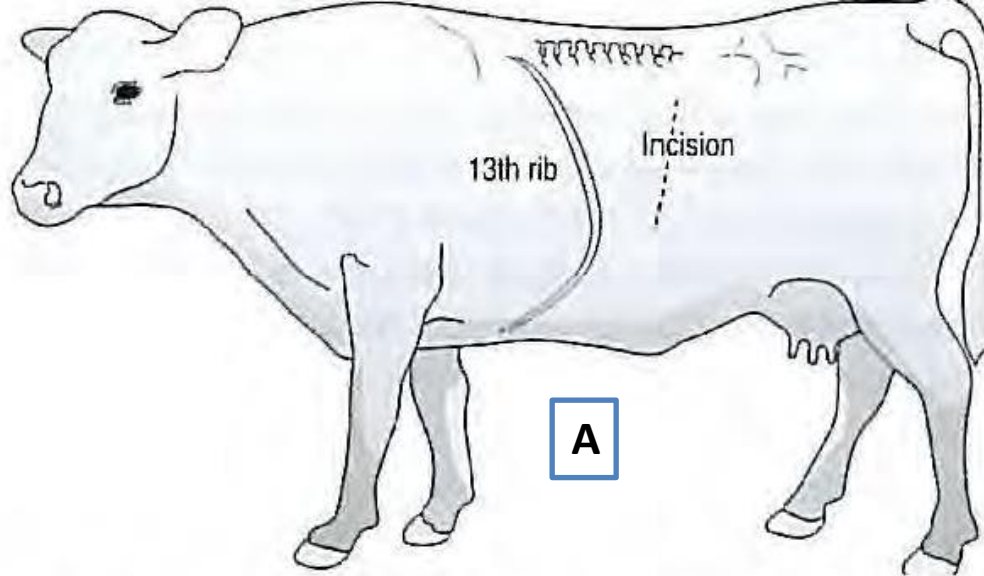
Note:

In Left Paralumbar Fossa approach----

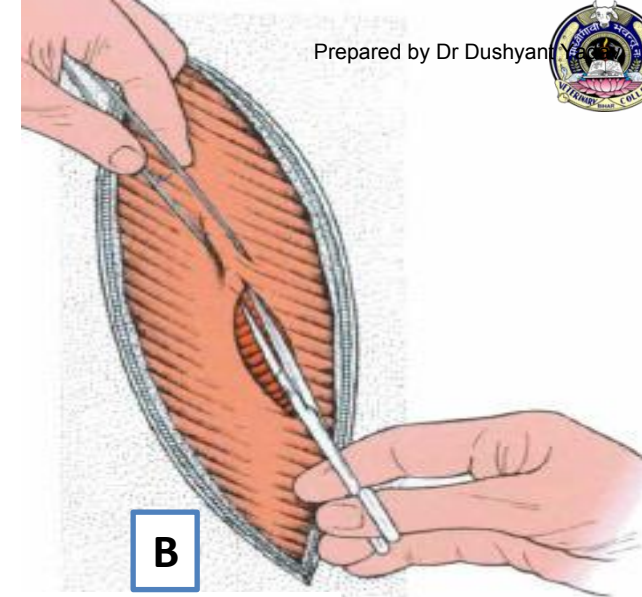
- peritoneum and transverse abdominal muscle in the first layer
- internal and external abdominal oblique muscles in the second layer

In Lateral Oblique approach---

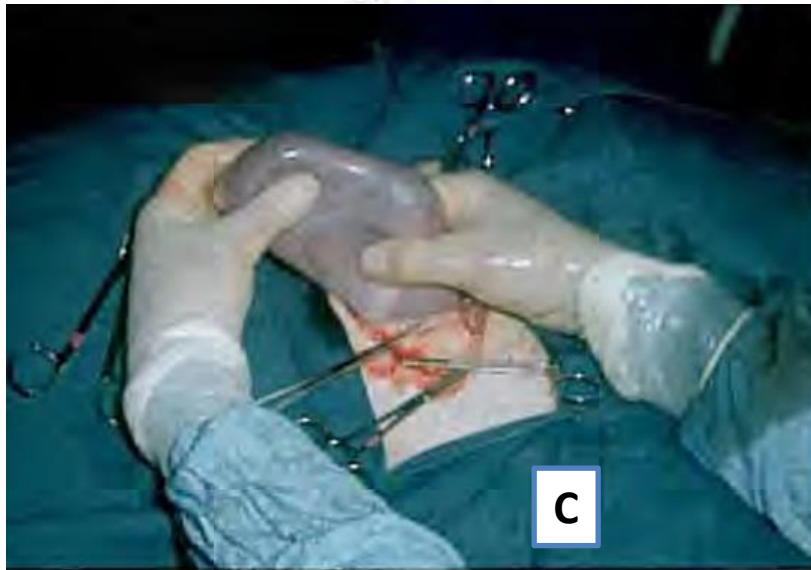
- Peritoneum and *transversus abdominis muscle* are incorporated in the first layer
- internal and external abdominal oblique muscles are sutured separately



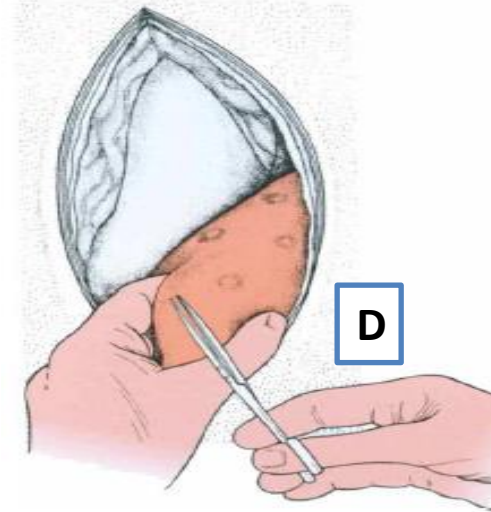
A



B



C



D

Fig: (A)- Left paralumbar fossa approach- **skin incision** site
(B)- incision of external oblique **muscle**
(C)- identify the greater curvature area of pregnant horn
(D)- incision over the greater curvature of **uterus**

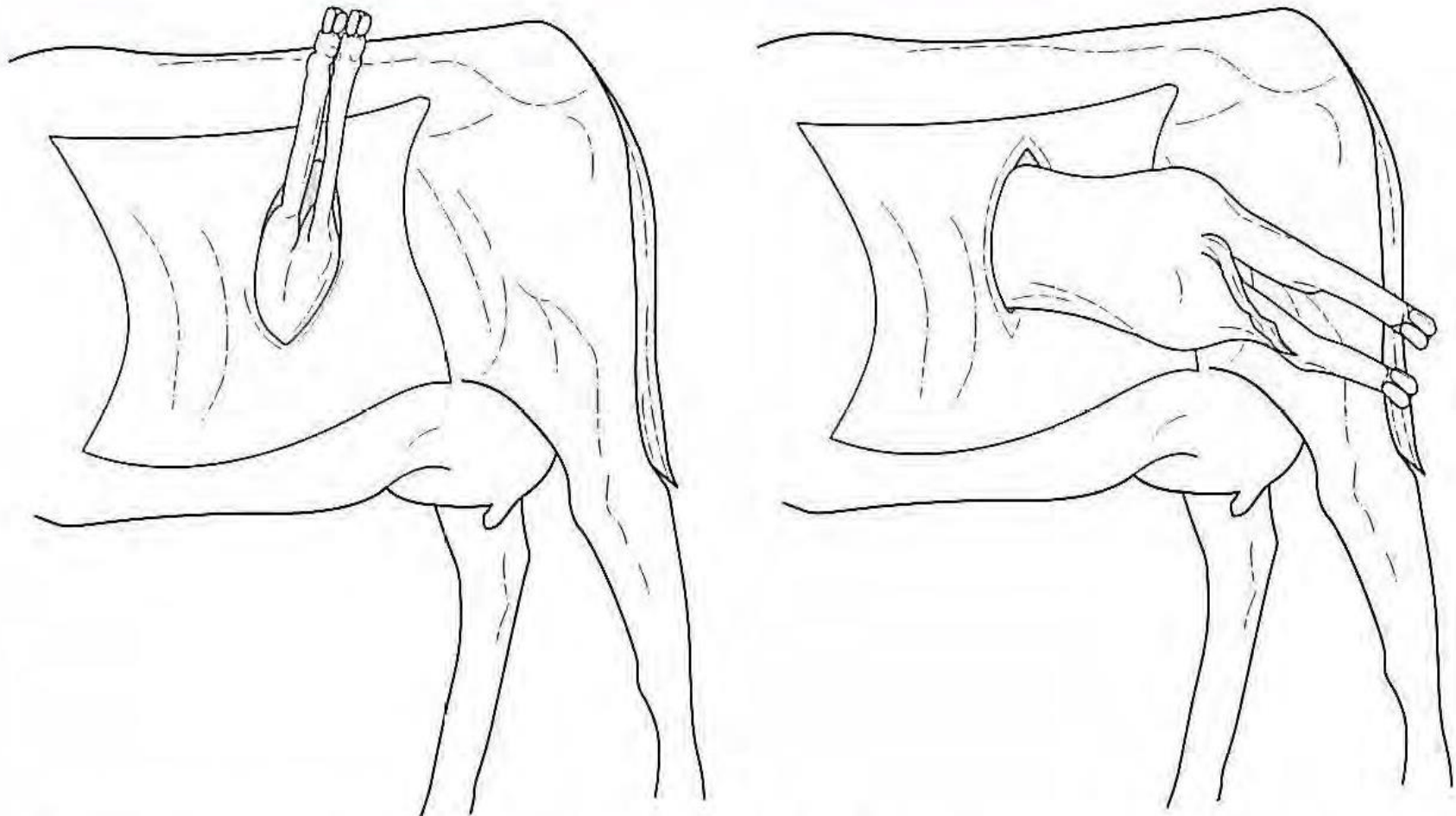


Fig: (A) Removal of fetus in anterior presentation through flank incision– first dorsally then laterally **(B)-** at the level of hip- caudally then laterally

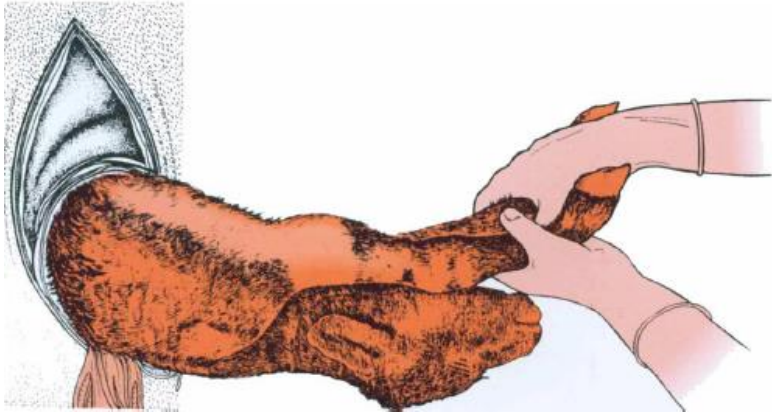
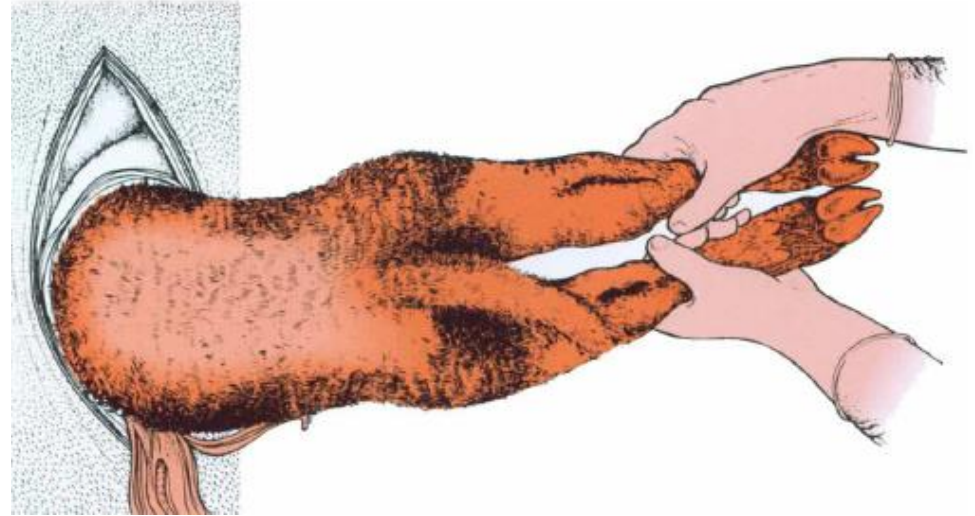
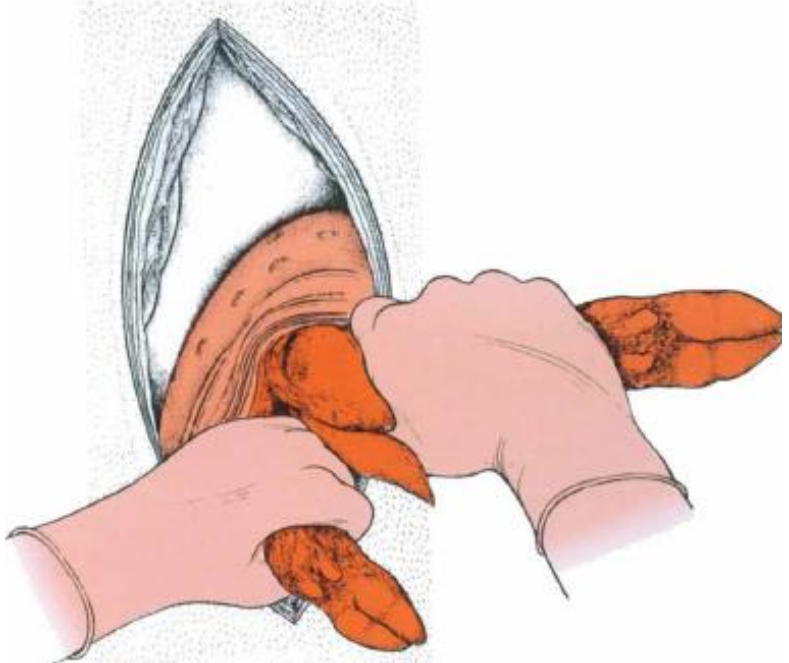
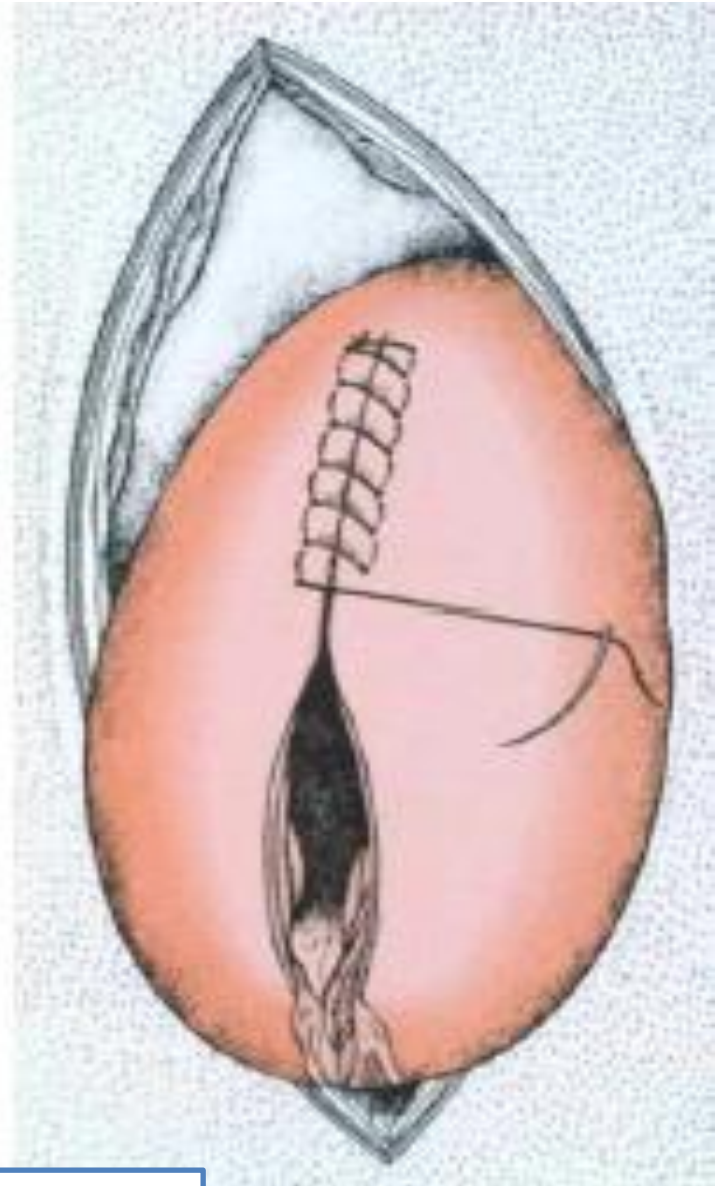
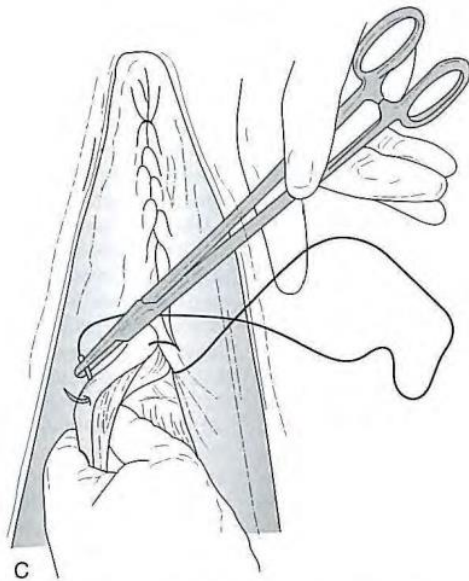
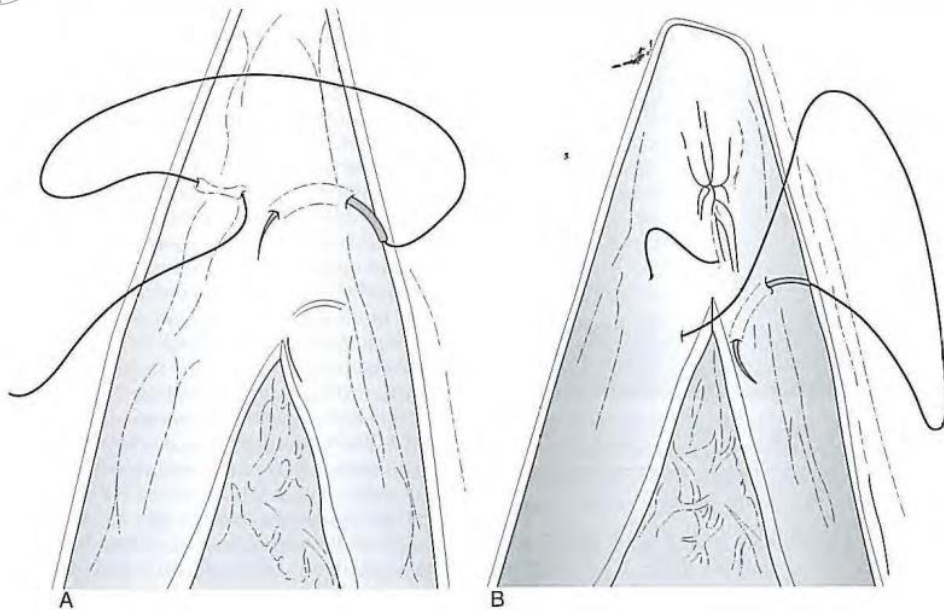


Fig: Removal of fetus in anterior and posterior presentation during C-section



Suturing of Uterus



Precautions

- ✓ **Fetal membranes** should be **removed** at the time of surgery
- ✓ Exteriorize both uterine horns before the genital tract begins to involute
- ✓ **Large vessels** that are haemorrhaging should be **ligated**
- ✓ Uterus should be supported by an assistant or held using uterine forceps

- ✓ **Suturing of uterus** should start at the **cervical end**
- ✓ **Paralumbar approach** is **not** recommended for the removal of **emphysematous fetuses**
- ✓ Uterine serosa should be **thoroughly lavaged**
- ✓ **Reduce dead space** by anchoring the suture into the underlying tissue
- ✓ **Infuse the Antibiotics** like procaine penicillin and dihydrostreptomycin between the suture layers



To Calf:-

- ✓ Calf should be **dried** and the **navel dressed** with an antiseptic immediately after delivery
- ✓ Administration of **colostrum** (use oesophageal feeding tube if necessary)
- ✓ Introduce the calf **in front of dam** to form a maternal bond



To dam:-

- ✓ **Oxytocin** 30-50 IU should be administered
- ✓ 300- 450 ml **Calcium Borogluconate** to aid the uterine involution
- ✓ **Antibiotics** are continued for 3 to 5 days
- ✓ Non-steroidal **anti-inflammatory** drugs for 48 hours after surgery
- ✓ Skin sutures should be removed after 2-3 weeks of surgery
- ✓ Postnatal examination of the genital tract must
- ✓ **Insemination** should be preferred after **60 days** postpartum



Post-Operative Complications

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- **Subcutaneous emphysema-** if the peritoneum is not closely apposed, causing emphysema
- **Adhesions**
- **Peritonitis-** Diarrhoea, pyrexia, inappetence and abdominal pain are the common signs of peritonitis
- **Seroma formation**
- **Wound dehiscence**
- **Nerve paralysis-** have the risk of temporary or permanent peroneal nerve injury if dam is recumbent after surgery
- **Fractures-** while attempting to rise after surgery



- Postpartum haemorrhage
- Metritis
- Retained fetal membranes
- Vaginitis
- Mastitis
- Uterine prolapse
- Suture abcess
- Herniation
- Infertility etc.

Success rates

Maternal survival rates following caesarean operation in most of surveys report ranges from 90- 98%.

(Deghani & Ferguson, 1982; Cattel & Dobson, 1990; Dawson & Murray, 1992)



Postoperative fertility

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- Conception rate ranged from 48-80% compared with 89% after normal calving (*Boucoumont et al 1978*)
- Increased incidence of abortion, hydrallantois and failure of the cervix to dilate at the next parturition

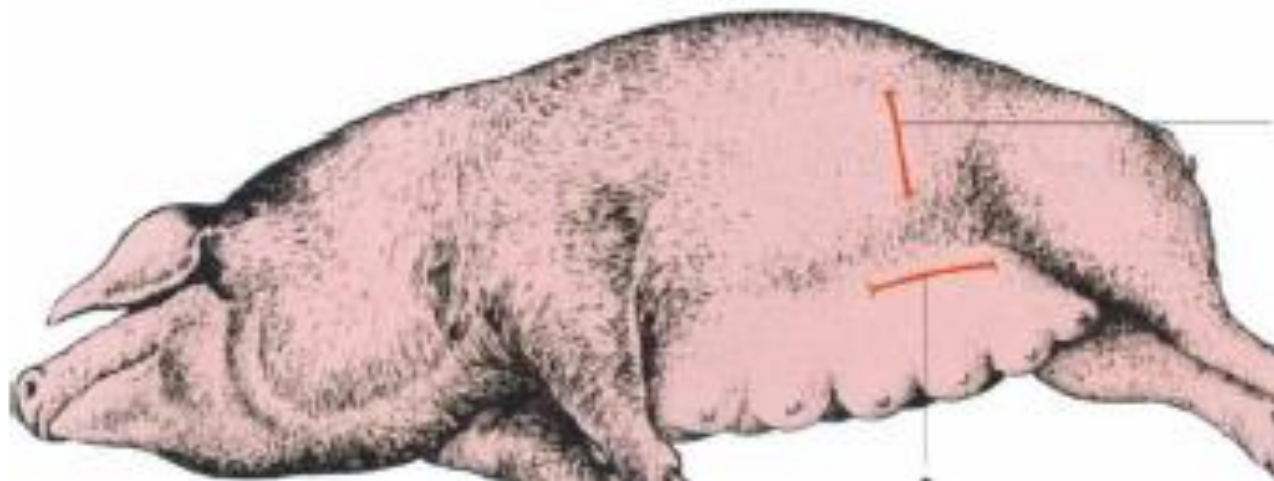


Surgical Sites in other animals

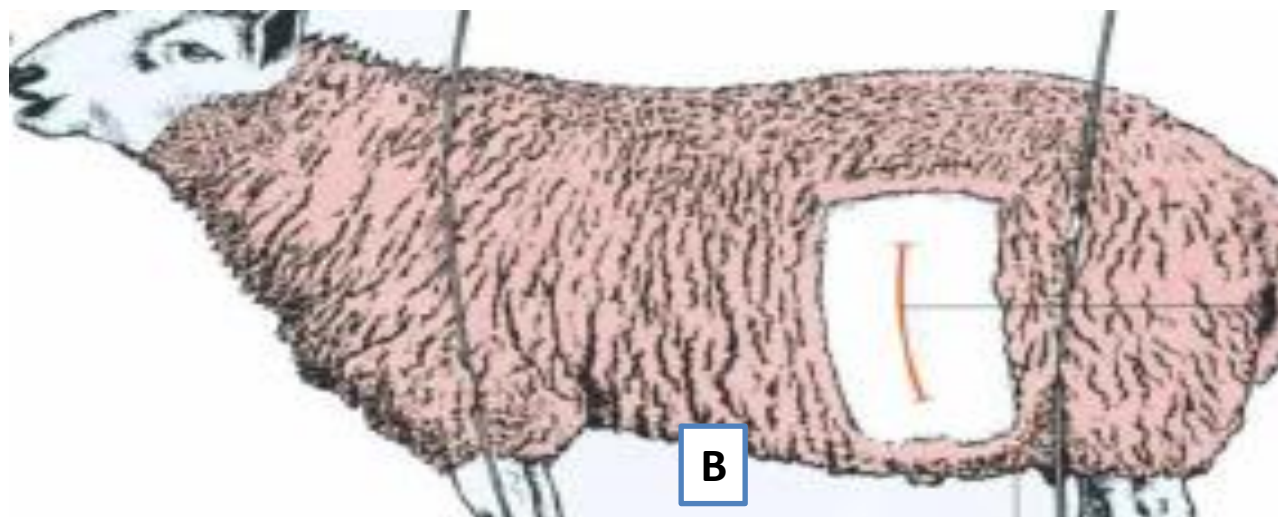
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- **Horses-** Midline, paramedian or ventral flank laparotomy
- **Sheep and goat-** Mid-paralumbar fossa
- **Pig-** Vertical paralumbar fossa or ventral flank on either side
- **Canine (dogs)-** ventral midline incision or flank approach
- **Feline- (Cats)-** ventral midline incision or flank approach



A



B

Fig: (A) incision sites in sow
(B) incision sites in sheep



THANK YOU

