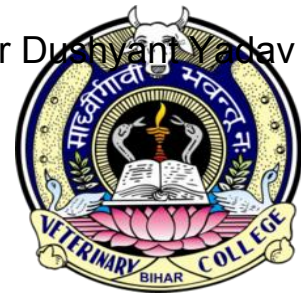




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Obstetrical Operations

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CONTENTS

➤ **Obstetrical Instruments**

➤ **Mutation**

➤ Repulsion

➤ Rotation

➤ Version

➤ Extension /Adjustment of Extremities

➤ **Force Traction**

Obstetrical Instruments

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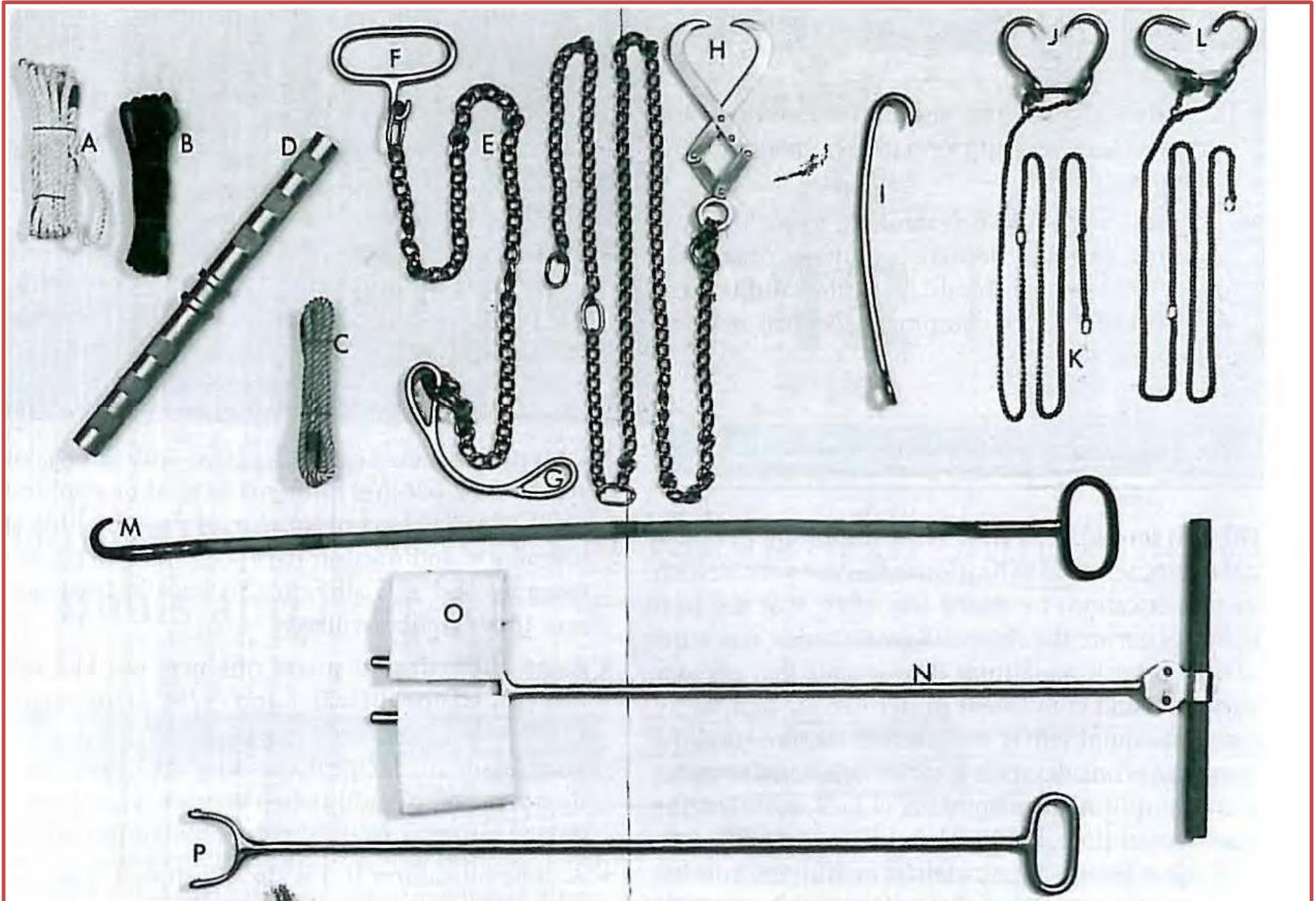


Fig:

A, B, C- Obstetric snares

D- Traction bars

E & F- Moore's obstetric chains with handles

G- Snare introducer

H- Krey-Schottler with double jointed hooks

I- Obermeyer's anal hook

J- Harms's sharp and blunt (**L**) paired hooks with chain (**K**)

M-Blanchard's long flexible hook

N- Cammerer's detorsion fork with canvas cuffs (**O**)

P- Kuhn's obstetrical crutch

Definition:-

“Mutation is defined as the process by which a fetus is restored to normal presentation, position, and posture by repulsion, rotation, version, or extension of extremities”

- Easier to correct when the dam is in standing
- In specific circumstances, lateral recumbency can be advantageous
- If mutation **cannot be completed in 15 to 30 minutes**, an **alternate method** for delivery should be selected

1. Repulsion/Retropulsion (Create Space)

“Repulsion of the fetus out of the maternal pelvis into the uterine cavity where more space is available for correction”.

❖ It is the first step in mutation”

Prerequisite-

- Fetus and birth canal must be well lubricated
- Abolish abdominal straining with an epidural anesthetic agents
- Clenbuterol may be administered to assist in relaxation of the uterine musculature

Instruments used-

- Kuhn's crutch repeller
- Operator's hands and arms-
 - In sheep, goat, swine- By hand
 - In bitch and queen- By finger
 - In bovines and equine-By hand , Kuhn's crutch repeller

✓ Position of the repeller (in case of bovine)-

- *In anterior presentation-*
 - B/w shoulder and chest
 - Across chest beneath the neck
- *In posterior presentation-*
 - In the Perineal region over the Ischial arch

Precautions-

- ✓ Care should be taken to avoid uterine rupture (result of excessive pressure)
- ✓ Operator's hands and arms should protect metal instruments during the insertion
- ✓ In neglected cases uterus may be tightly contracted around the fetus, so repulsion should be avoided

2. Rotation (Correct the position)

*“Rotation is defined as turning the fetus **on its longitudinal axis** to bring it from dorso-iliac or dorso-pubic position to dorso-sacral position”*

- Partial rotation is also beneficial
- Rotation can be done by-
 - **In bovines-** Hand, cross traction of limbs according to position, Cammerer's detorsion fork
 - **Sheep, goat, swine-** Hand
 - **Bitch and cat-** fingers and forceps

- In many cases, rotation can be accomplished by the **hand and arm** of the operator-
 - by grasping humerus of the ventral limb near the shoulder joint
 - lifts the fetus upward and medially
 - traction on the dorsal fetal limb in a downward and medial direction
 - alternatively, fetal limbs can be crossed and rotational force should be applied

- In difficult cases, a **Detorsion fork** can be used

3. Version (Correct the presentation)

*“Version is defined as turning the fetus **on its transverse axis** into anterior or posterior presentation”*

- Transverse presentation is rare in cattle but must be converted to longitudinal presentation
- Extractive force is applied to the portion of the fetus closest to the maternal pelvis while the opposite pole of the fetus is repelled
- Version usually is limited to 90 degrees

Note:

- Attempts to convert caudal presentation to cranial presentation are not likely to be successful and will commonly result in uterine tears

4. Extension/ Adjustment of Extremities

(Correct the posture)

“It is the correction of abnormal posture usually due to flexion of one or more extremities”

- In general, correction of a flexed extremity is accomplished by
 - repelling the proximal end
 - rotating the middle portion laterally
 - applying traction to the distal end

Note:

- ✓ **Repelling and rotating forces can be applied with the operator's hand**
- ✓ **Traction can be applied by the operator if sufficient space is available or by an assistant using an obstetric chain or snare**

Correction of Displaced fetal Head:-

- Most commonly is deviated to the left side of the fetus and lies against the thoracic wall
- Malposture is corrected by grasping the orbital grooves with the thumb and middle finger (forceps grip) and drawing the head into the maternal pelvis
- A rope snare placed behind the incisor teeth may be useful in difficult cases
- *Traction to redirect the head can be applied with the snare by the operator or by an assistant while with the other hand the operator guides the head and protects the uterine wall from the incisor teeth by covering the mouth of fetus*

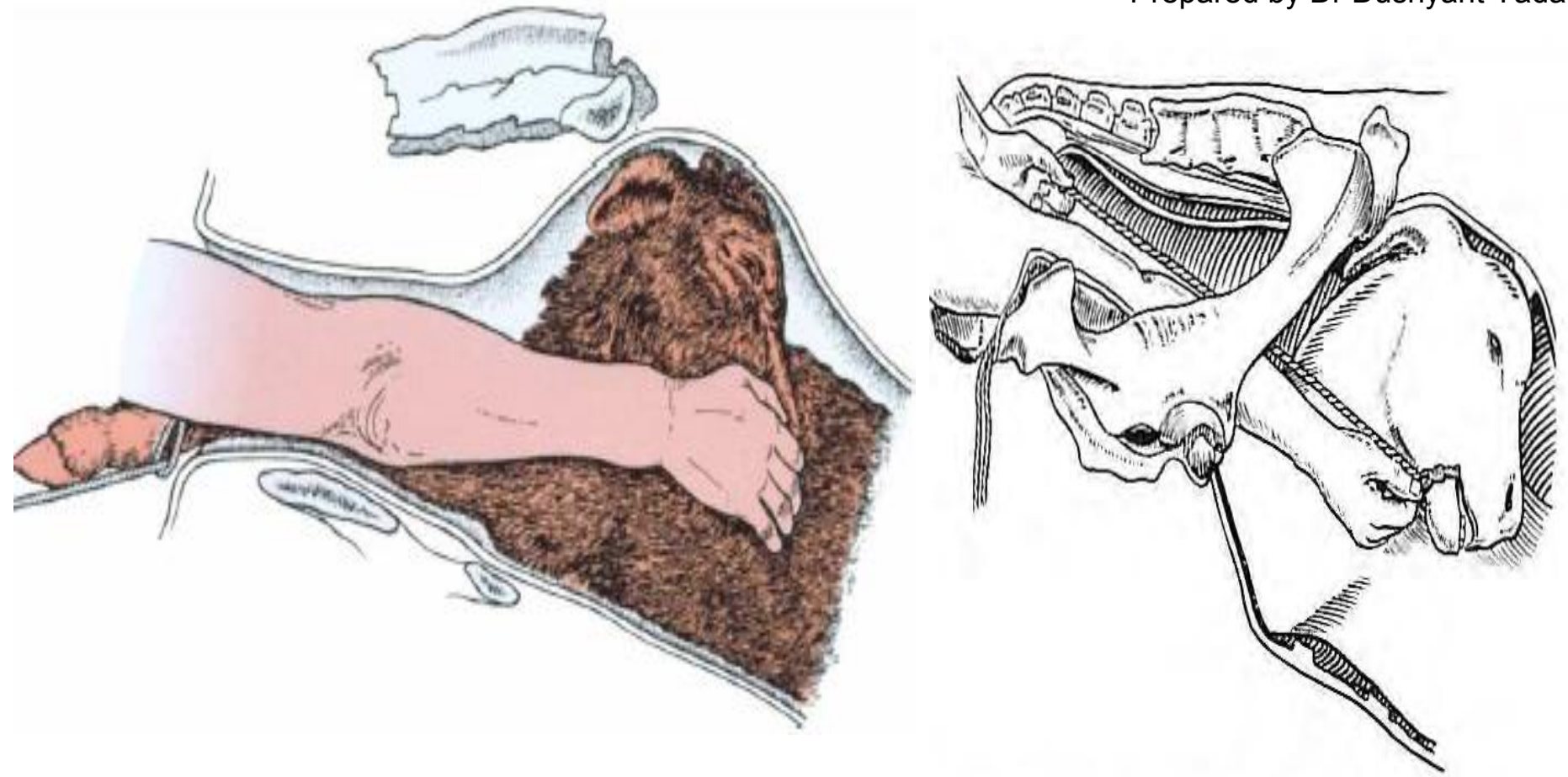
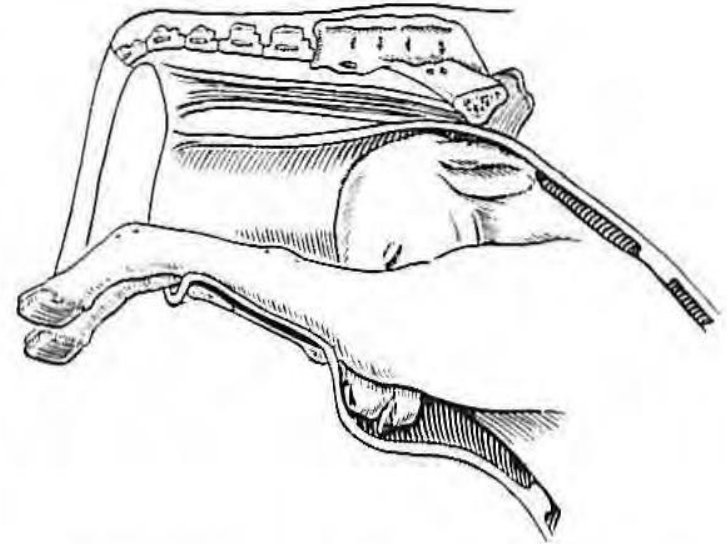


Fig: Correction of Laterally Deviated Head

*Head -deviated ventrally
between the forelimbs,
with the mandible resting
against the sternum -----*

- A hasty examination may fail to reveal the presence of the head, and the malposture **may be mistaken for a case of caudal/posterior presentation**
- In this case correction should be done by repelling fetal

forehead with the thumbs while simultaneously lifting the jaw with the fingers.



➤ In more severe cases-----

- repelled the one or both forelimbs and flexed at the carpus, elbow, and shoulder joints
- then, space will be available to convert the ventral displacement of the head to lateral displacement
- correction of head is done by drawing the head into the pelvis

➤ Some times repositioning of the fetal head is necessary-----

- in this cases dam can be cast, and rolled to dorsal recumbency (mild sedative should be used if required),
- then fetus falls toward the maternal spine and away from the narrow ventral portion of the pelvis
- leads to more easy to correct the deviated head

Correction of Displaced Fore limbs:-

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Unilateral or bilateral carpal flexion-Most commonly and responsible for dystocia

- If flexed carpus along with the fetal head---
 - within the maternal pelvis, the situation is described as engaged carpal flexion
 - cranial to the maternal pelvis it is described as disengaged carpal flexion

- During the correction,—
 - fetus and flexed limb should be repelled cranially out of the pelvis to increase the space.....
 - introduces your hand corresponding to the side of the displacement into the birth canal
 - grasps the metacarpus immediately proximal to the fetlock.....

- lift the limb dorsally which leads to flexion of shoulder and elbow joints
- **cover/cupped** the **hoof** by your palm
- pulled the limb of fetus in to the pelvic cavity

Note:

- ✓ *If needed, **traction can be applied** with a snare placed proximal to the fetlock joint*
- ✓ *While lifting and **repelling the carpus with one hand**, the operator applies **gentle traction to draw the hoof** into the pelvis with the other*

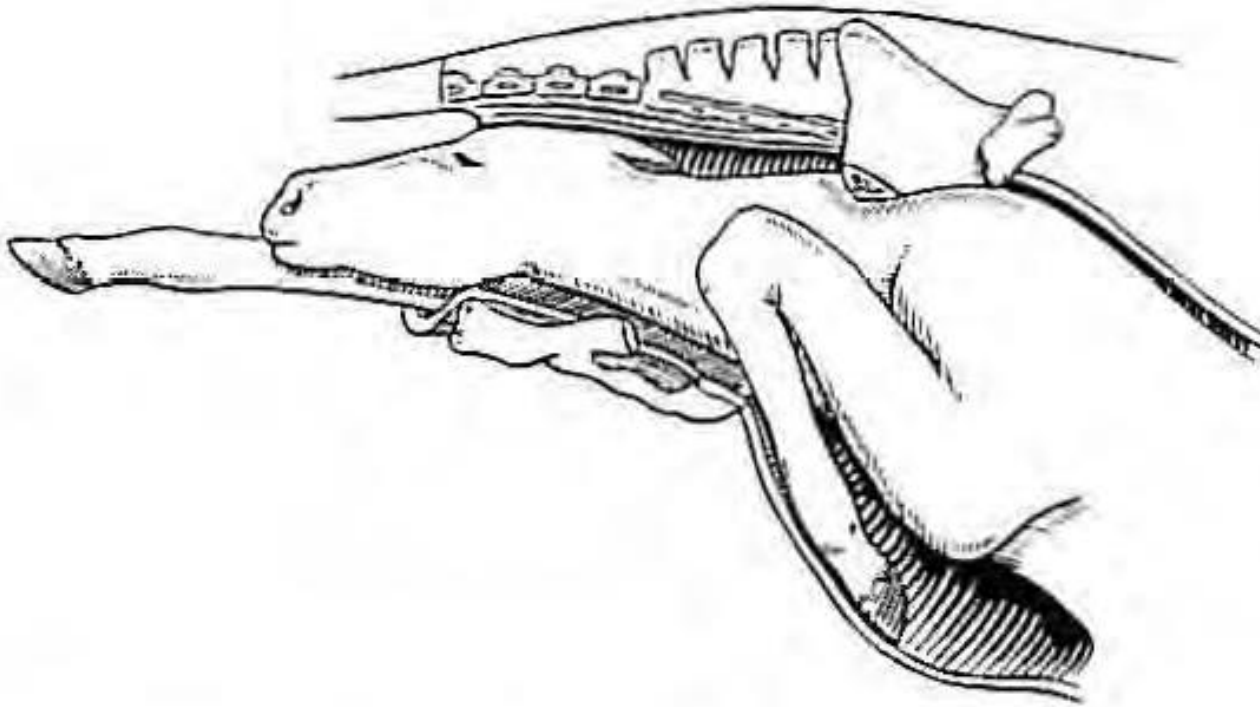


Fig: Unilateral carpal flexion

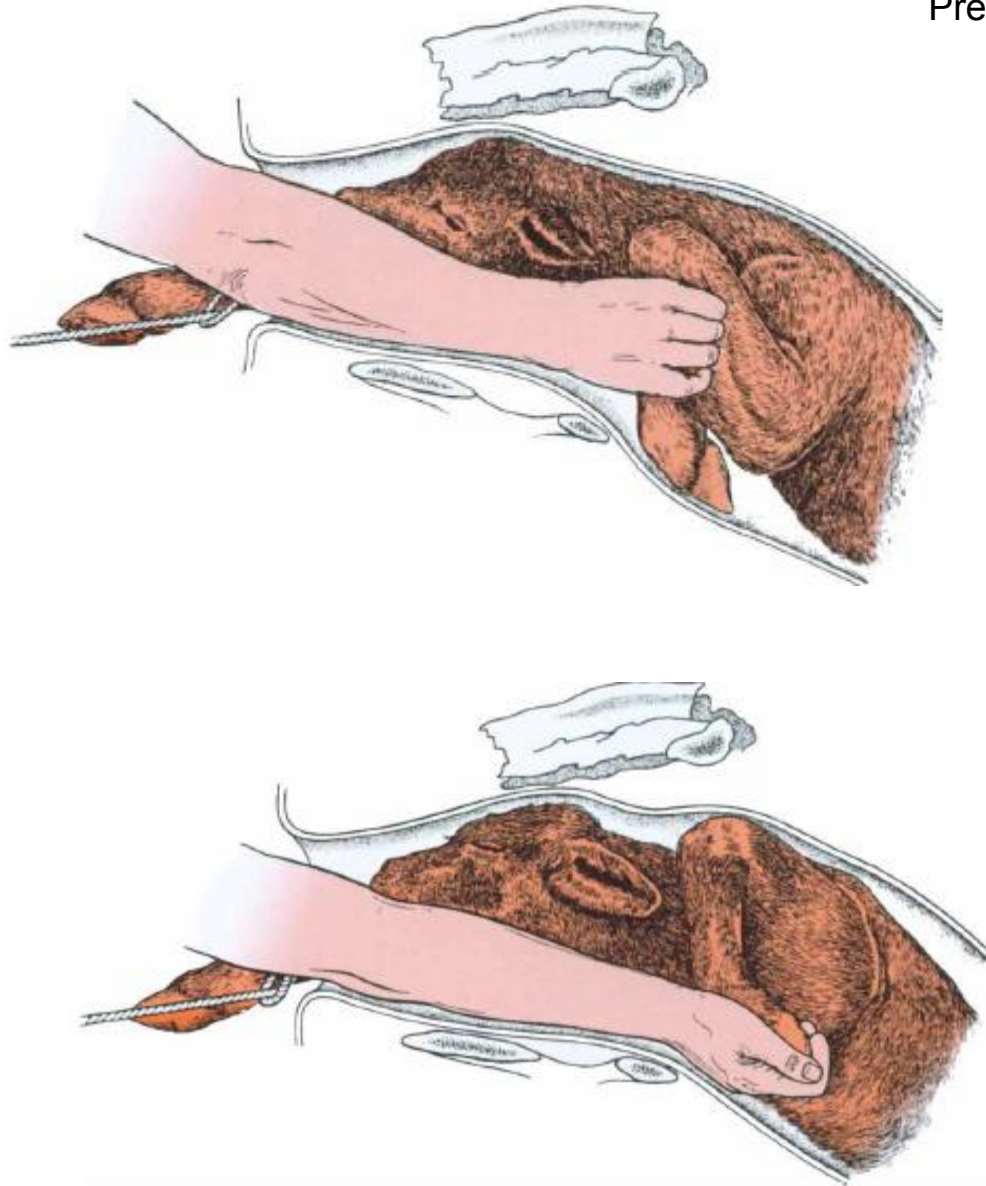


Fig: Correction of carpal flexion

Flexion of Shoulder joints-(fore limb positioned alongside of under the fetal abdomen)

- unilaterally or
- bilaterally flexed
- Correction is done by--
 - grasping the radius
 - and pulling it toward the maternal pelvis
 - leads to conversion of shoulder flexion in **carpal flexion**
 - a snare can be placed distal to the carpal joint

Shoulder-elbow flexion or elbow lock posture

- **most common in heifers**
- results in impaction of the elbow joints on the pelvic brim
- In this condition **muzzle** of the fetus **lies anterior to hooves** approximately at the middle of the metacarpus

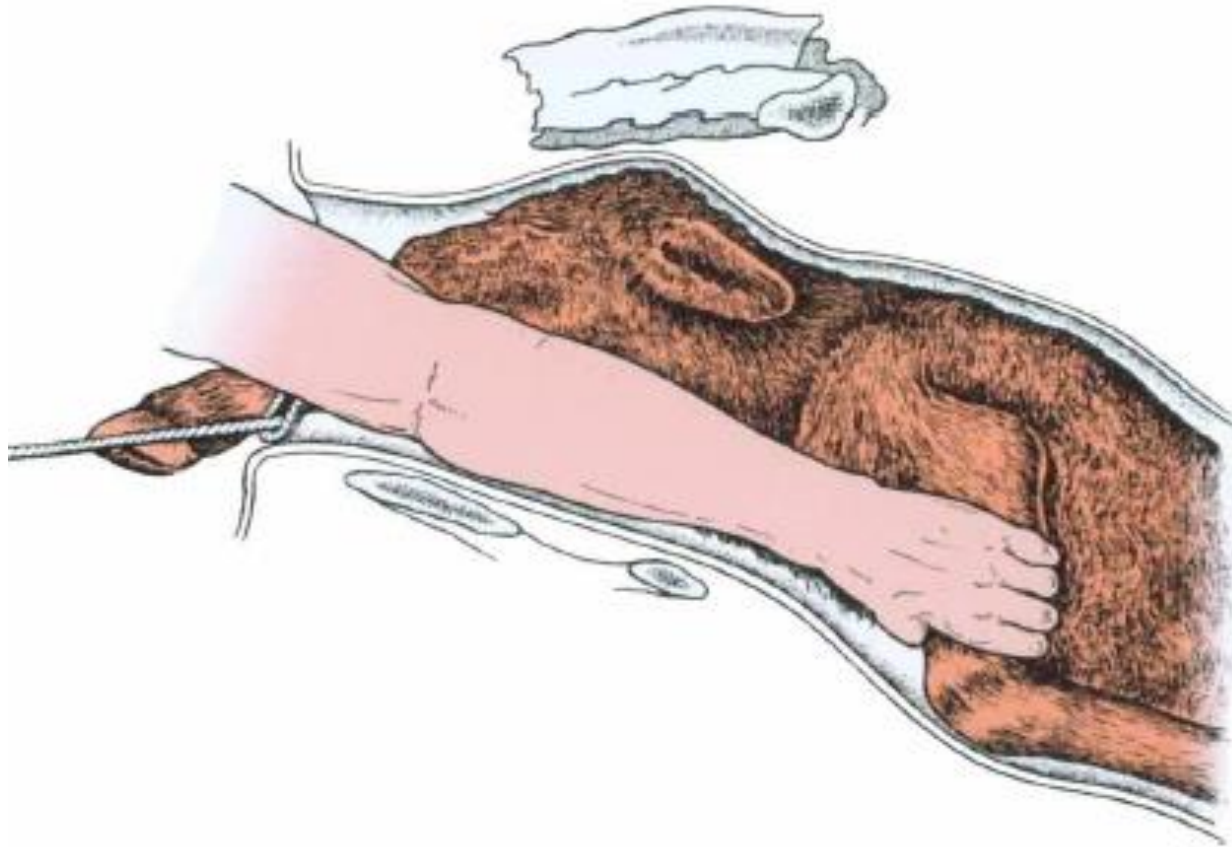


Fig: correction of Shoulder Flexion

Correction of Displaced Hind limbs:-

- Displacement of the hind limbs is **rarely** a problem unless the fetus is in caudal presentation
- One or both hind limbs may be retained and flexed at the hock or at the hip

Hock flexion posture-

Correction procedure-

- limb is grasped at the metatarsus
- and repelled cranially and laterally until sufficient space is available
- draw the hoof in a caudal and medial direction into the birth canal

NOTE-

- Operator should cover the hoof with one hand to protect the uterine wall
- Application of a snare distal to the fetlock joint facilitate correction with gentle traction

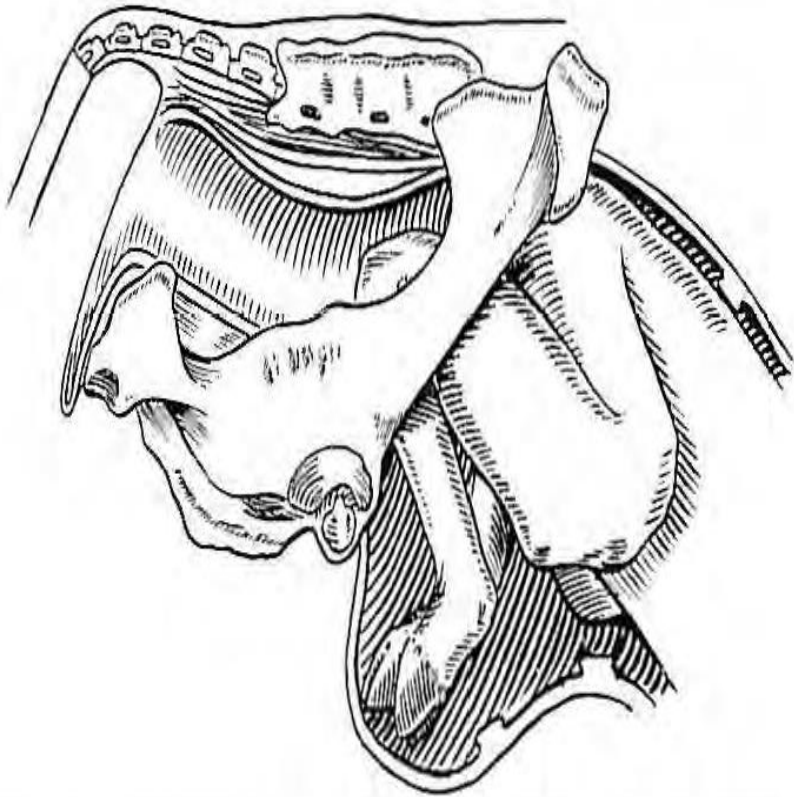


Fig: Bilateral Hock Flexion

Fig: Correction of Hock Flexion

Bilateral hip flexion (“true breech” presentation)-

- It prevents the entry of fetus into the birth canal

Corrected by-

- grasping the lateral aspect of the tibia as closely as possible to the hock
- then hock and stifle joints are flexed by drawing the hock toward the maternal pelvis
- after the hock and stifle joints are fully flexed, the malposture becomes hock flexion, which subsequently is corrected as previously described

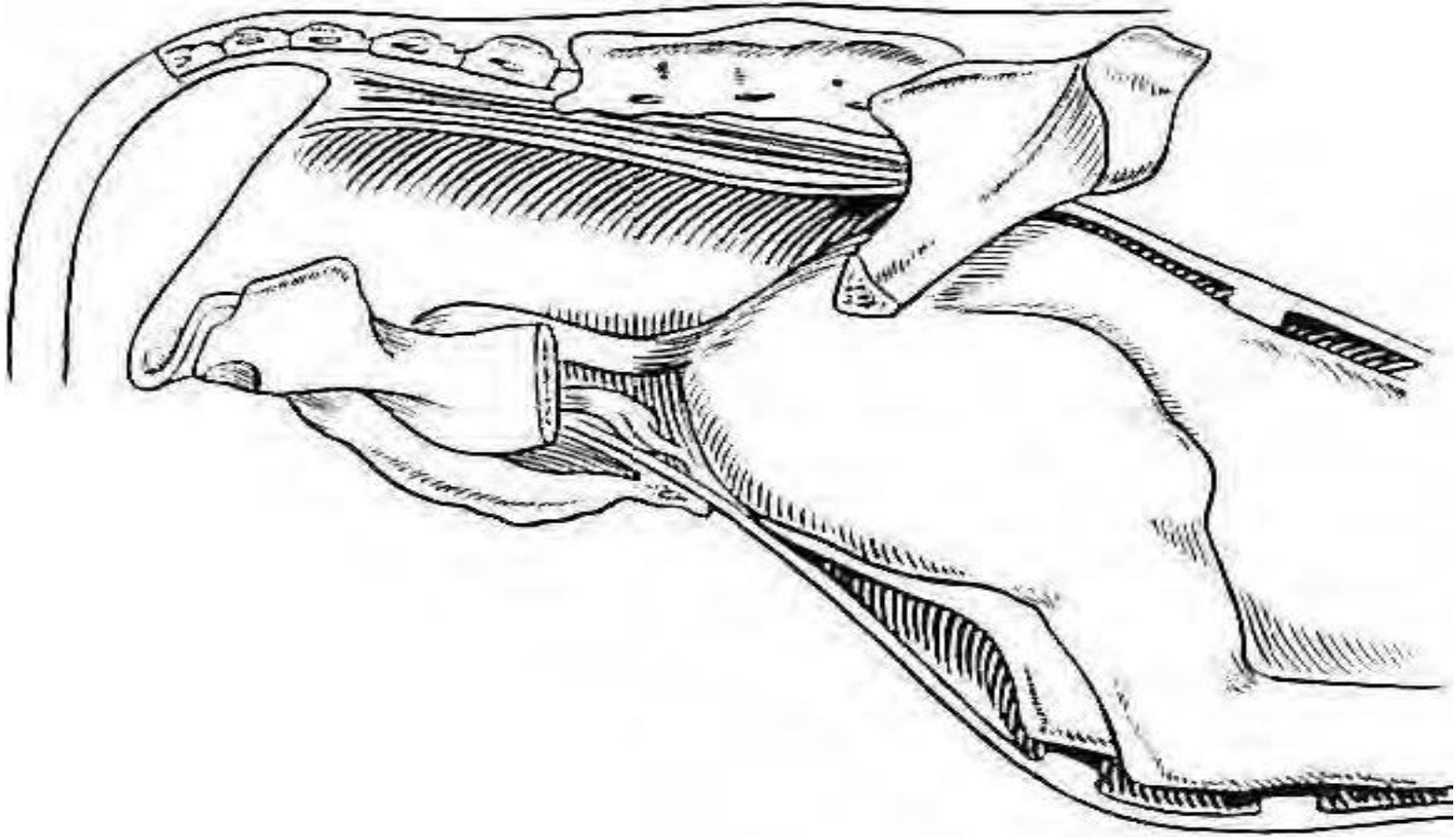


Fig: Bilateral hip flexion (BREECH PRESENTATION)

Ventrovertical or dog-sitting position-

diagnosed by careful examination.

Correction is done by repelling the hind limbs as deeply as possible into the uterus

Note-

- ✓ Successful only when the fetus is small
- ✓ Delivery by cesarean section or fetotomy may be preferable in many cases
- ✓ Common in equines

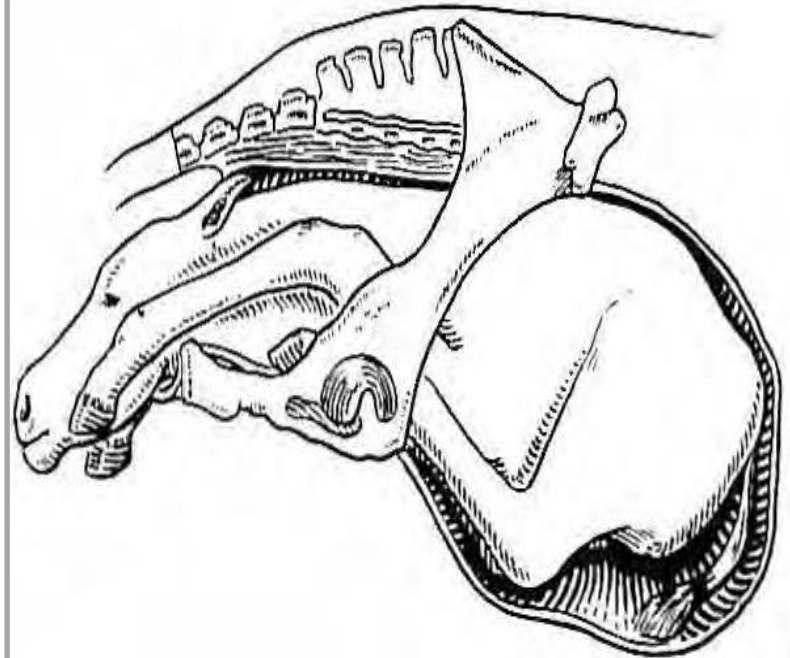
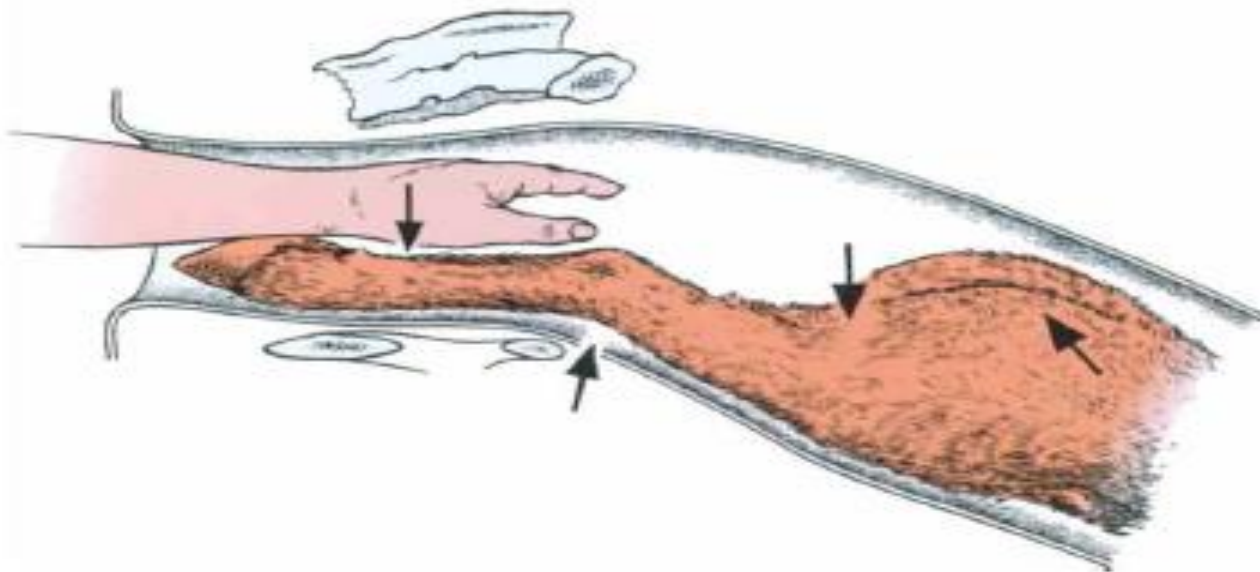


Fig: Dog sitting position of foal

Identification of **fore and hind limbs** by systematic palpation of joints

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Delivery by Force Extraction/ Traction

“Defined as the withdrawal of fetus from the dam through birth canal by application of outside force or traction”

- ✓ During **normal parturition an average force** of approximately **70kg (150lb)** is required to deliver a bovine fetus
 - ✓ 40% by uterine contractions
 - ✓ and 60% by the abdominal press

- ✓ Extractive force should be **applied only simultaneously with the dam's abdominal press**, and tension is released when the dam ceases to strain (not in all cases)

Indications:-

- ✓ Uterine inertia (primary)
- ✓ After mutation in the case of dystocia
- ✓ Fetal oversize
- ✓ Small birth canal
- ✓ Posterior position
- ✓ To save the time or to avoid fetotomy or C-section etc.

Contraindications:-

- ✓ Abnormal PPP
- ✓ Narrow birth canal
- ✓ Secondary uterine inertia
- ✓ In the case of ICD (incomplete cervical dilation)
- ✓ Lacerated birth canal etc.

Precautions:-

- Improper or **excessive obstetric traction** has been reported to result in **fractures** of the ribs and vertebrae
- Calves delivered in cranial presentation also may suffer **damage to the femoral nerve** with excessive traction
- Excessive traction can cause maternal **obstetric paralysis, pelvic or hip fractures, and soft tissue tears of the reproductive tract**
- Direction of traction in the form of “**arc**”, should be steady and in even manner etc.

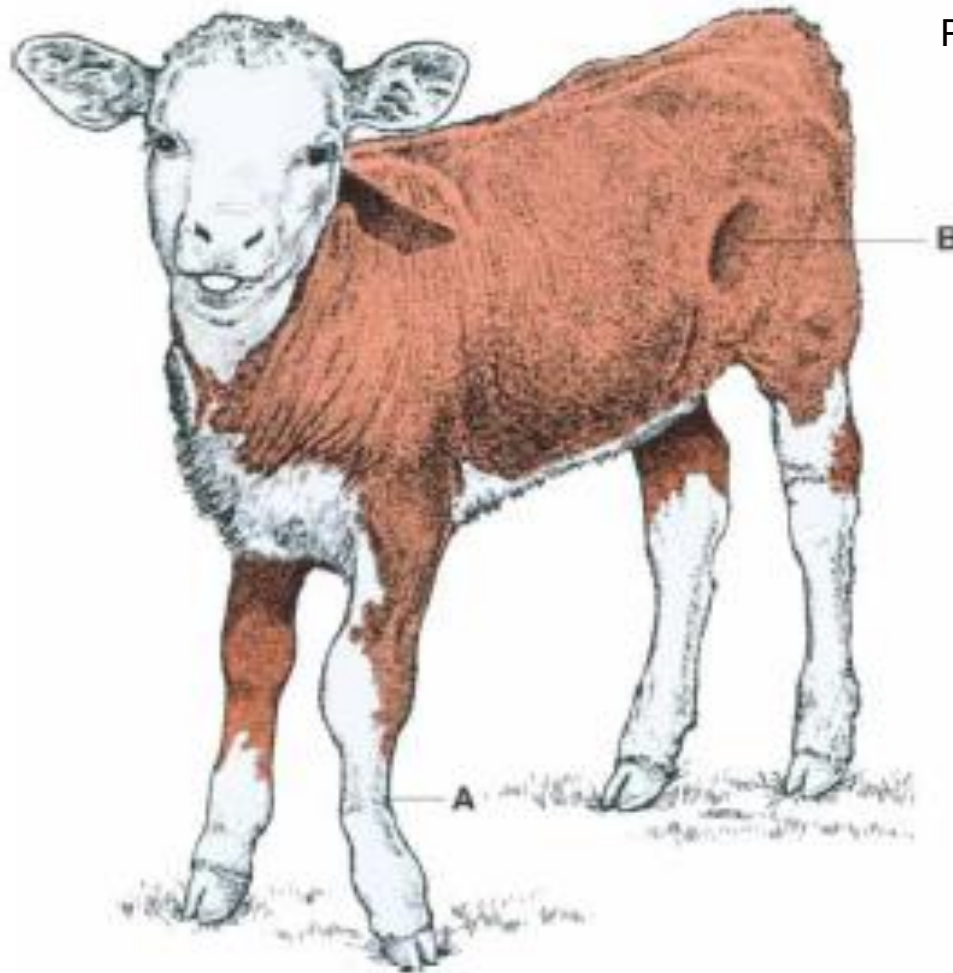


Fig: Calf Showing injuries caused by excessive traction
(A) Fractured metacarpus
(B) Quadriceps atrophy caused by femoral nerve paralysis

Use of Obstetrical Chains or Snares:-

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- Obstetric chains or snares commonly used to traction of limbs
- In anterior presentation applied to the pastern or above the knee or elbow
- A loop of the chain proximal to the fetlock joint of the fetus and make a half-hitch of the chain around the pastern
- Snare may be applied around the lower jaw
- Head snare may be used for the traction in the case of dead fetus but some times in live fetus also

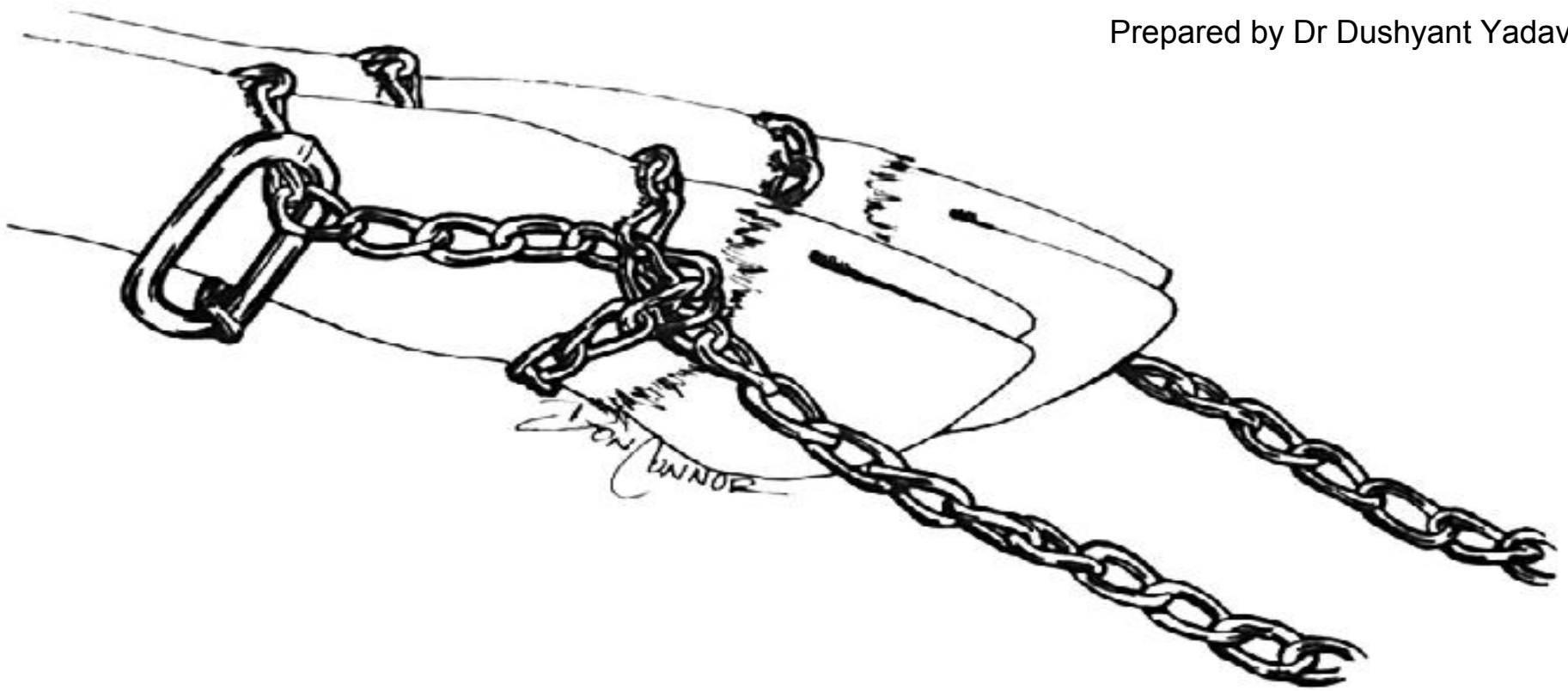


Fig: Most common method of applying obstetric chains on a bovine fetus is to place the loop of the chain above the fetlock joint and a **half-hitch** around the pastern. Traction is applied to the dorsal aspect of the limb.

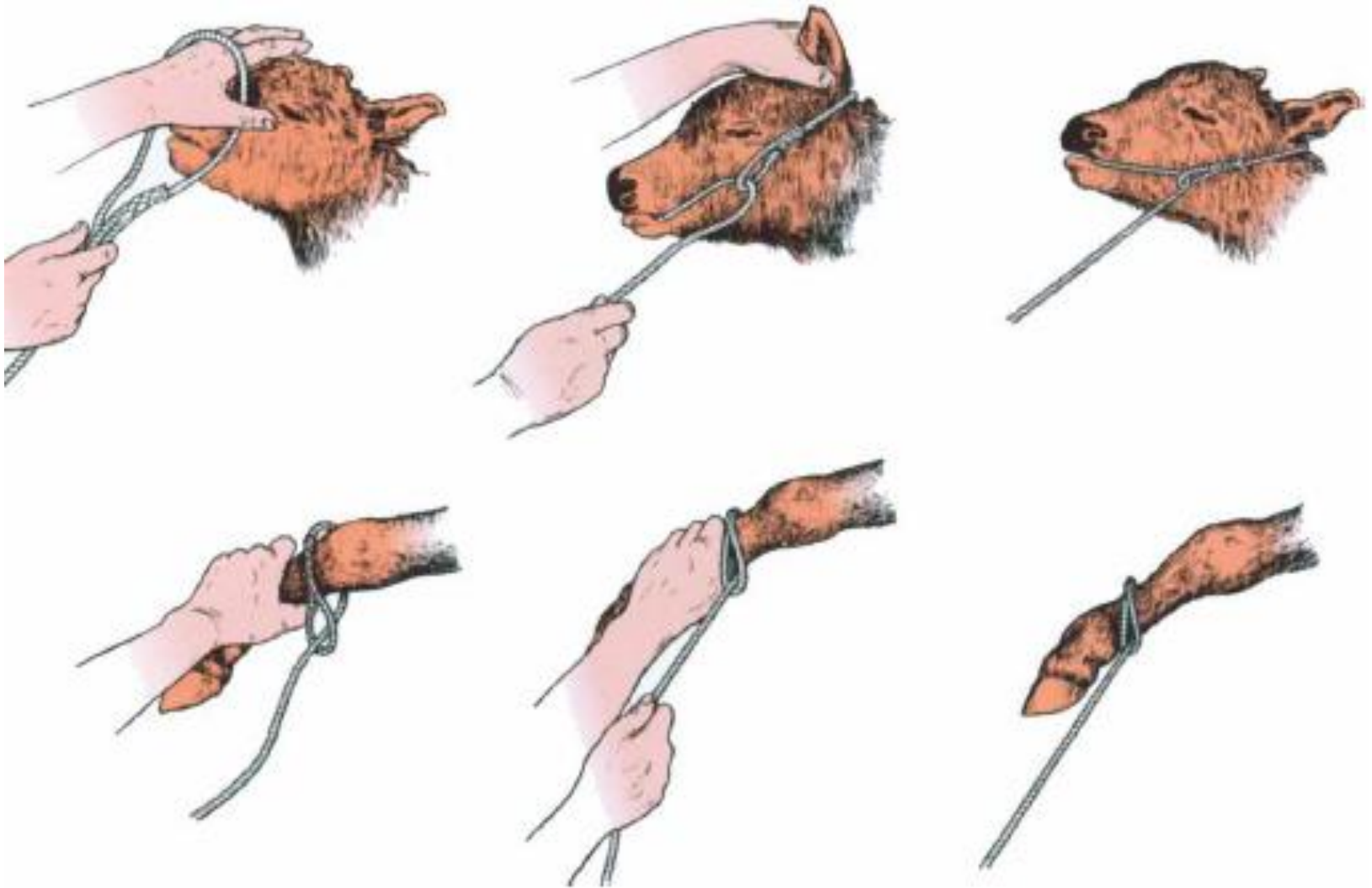


Fig: Application of Calving Rope

Extraction of the Fetus in Cranial Presentation:-

- Positioning of head and extended fore limbs within the pelvic cavity is necessary if more space available
- It is safe to deliver the head first then fore limbs
- **Operator's hand** is placed behind the head to **guide** it into the pelvic cavity (pelvis)
- If **calf is oversized**, cast the cow into right **lateral recumbency** before applying traction (may in left side if necessary)
- After the head has been drawn into the pelvis **evaluate the space available** between the fetal cranium and the maternal sacrum

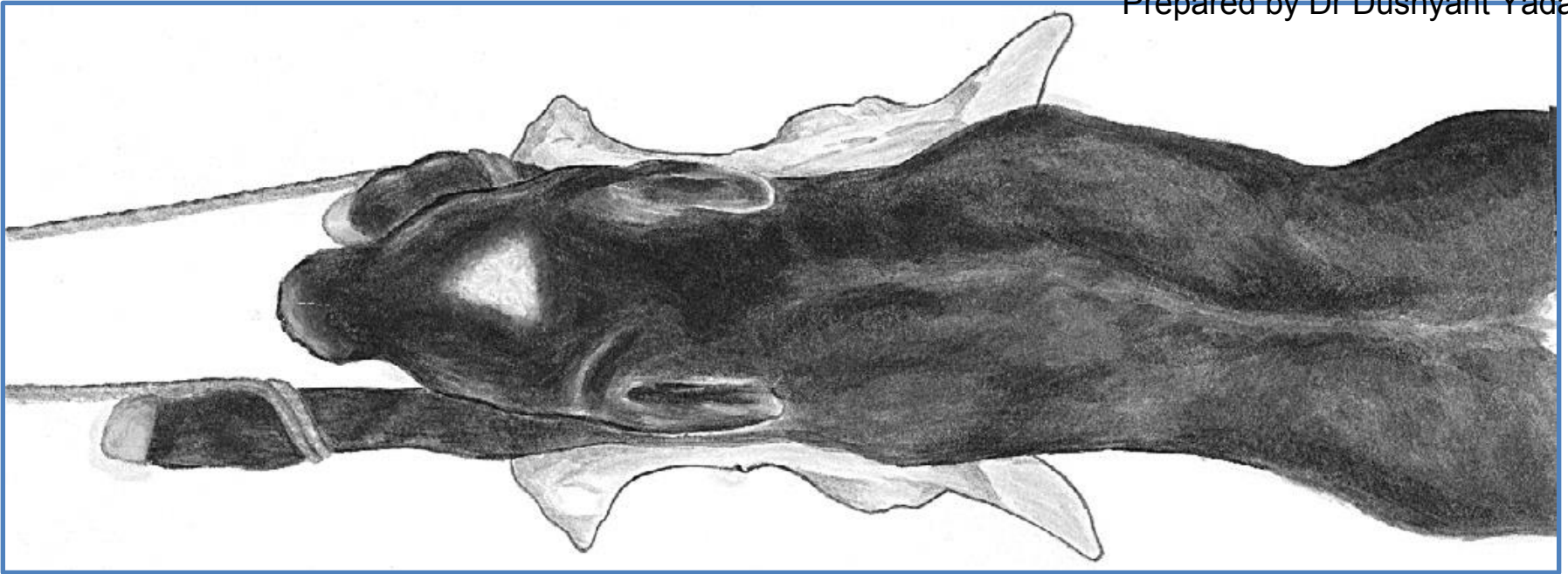


Fig: Dorsal view of the proper application of traction for delivery of an oversized bovine fetus (Traction is applied to one limb until shoulder and elbow are extended. After the first limb has been extended, traction is applied to the another limb. Thus, the shoulders enter the maternal pelvis successively, not simultaneously)

- If the second shoulder cannot be drawn upto the ilium, the operator should select delivery by fetotomy or cesarean section
- *A common error is to apply traction to both forelimbs before the shoulder joints have crossed the pelvic inlet*
- After both **shoulder joints** have **passed the pelvic inlet**, **traction is applied simultaneously to both fore limbs** in a **caudal and slightly ventral direction** until the head emerges from the birth canal

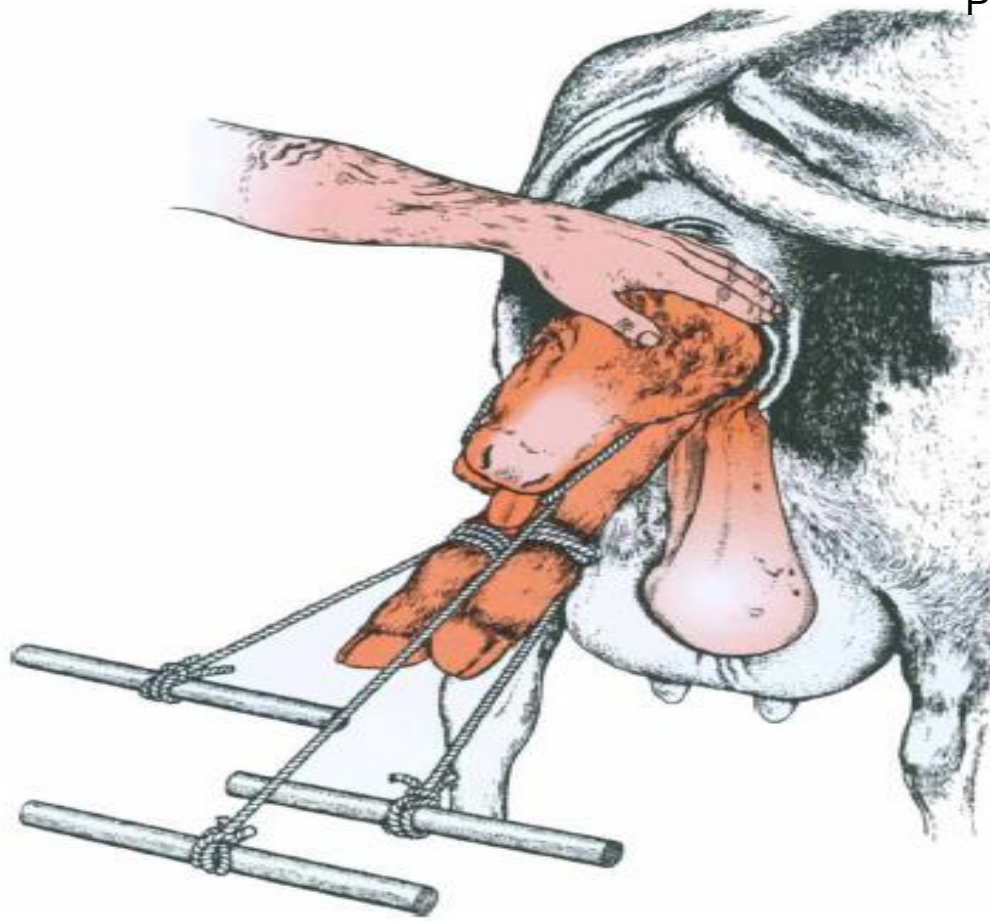


Fig: Assisted Delivery in anterior presentation

- The **fetal hips** and stifle joints constitute the next **obstacle to delivery** of a fetus in cranial presentation
- Pelvis of cows is oval in shape, with the **greatest diameter between the sacrum and the pubis**, whereas at the level of the stifle joints, the width of the fetus is greater than its height
- Thus, the fetus must be **rotated from dorsosacral position to dorsoilial** position to permit the widest portion of the fetal hind part to pass through the largest diameter of the maternal pelvis

- To achieve this goal, **rotation of the fetus must begin as soon as the head emerges from the vulva**
- Rotate the forepart of the fetus nearly 180 degrees to obtain the 60- to 90-degree rotation of the hind part (*required for proper entry of the stifle joints into the pelvis*)
- Traction is continued simultaneously on both limbs in a caudal and slightly dorsal direction and in concert with the dam's abdominal press

- **Hip-lock may occur despite use of proper technique**
- In cases of hip-lock, traction should be suspended and stimulated the fetus to breathe
- An attempt should be made to palpate the fetal hind part and determine the degree of rotation
- If sufficient rotation has not been accomplished, the fetus should be repelled and rotated

- Traction is applied in a caudal and slightly dorsal direction simultaneously with the dam's abdominal press
- If efforts to deliver the fetus are not successful, the fetus can be pulled sharply around toward the dam's flank
- This tactic further rotates the fetal pelvis and causes one hip to enter the pelvis ahead of the other
- If these procedures fail to result in delivery, the final option is partial fetotomy or pubic symphysiotomy or c-section

Extraction of the Fetus in Posterior Presentation:-

- Delivery of a fetus in posterior/caudal presentation poses relatively more risk and **should be attempted more rapid**
- **Fetus is first rotated into dorso-ilial position preferably** so that fetal hind part approaches the widest diameter of the pelvis
- Rotation can be accomplished by crossing and twisting the hind limbs
- After the fetus has been rotated, two assistants apply traction simultaneously to both hind limbs
- Delivery is likely to be successful if the fetus can be extracted sufficiently to expose both hocks outside the vulva

- If the hocks cannot be exposed, for a safe delivery another methods are selected
- After the hips have passed the pelvic inlet, the fetus is **rotated back to its normal dorso-sacral position** by applying caudal and slightly ventral traction
- When the hips have exposed at vulva, the fetus is extracted as rapidly as possible

Note:-

- **Excessive traction** on fetus in caudal presentation has been implicated as the cause of several injuries including **fracture of vertebrae in the thoraco-lumbar region**

Mechanical fetal extractors

- Mechanical fetal extractors are useful devices when minimal human assistance is available
- These devices are best used as a bent lever, with traction being applied to the fetus only when the cow strains
- Before using it, the case should be properly assessed for a vaginal delivery

Procedure:-

- Device is positioned on the cow and the chains from the calf's legs are attached to the hook on the ratchet
- As the cow commences an abdominal strain, the shaft of the device is pushed firmly in a ventral direction to assist with the delivery
- Once maternal straining ceases, the shaft is lifted dorsally and the ratchet worked to again take up the tension, in preparation for the next abdominal press

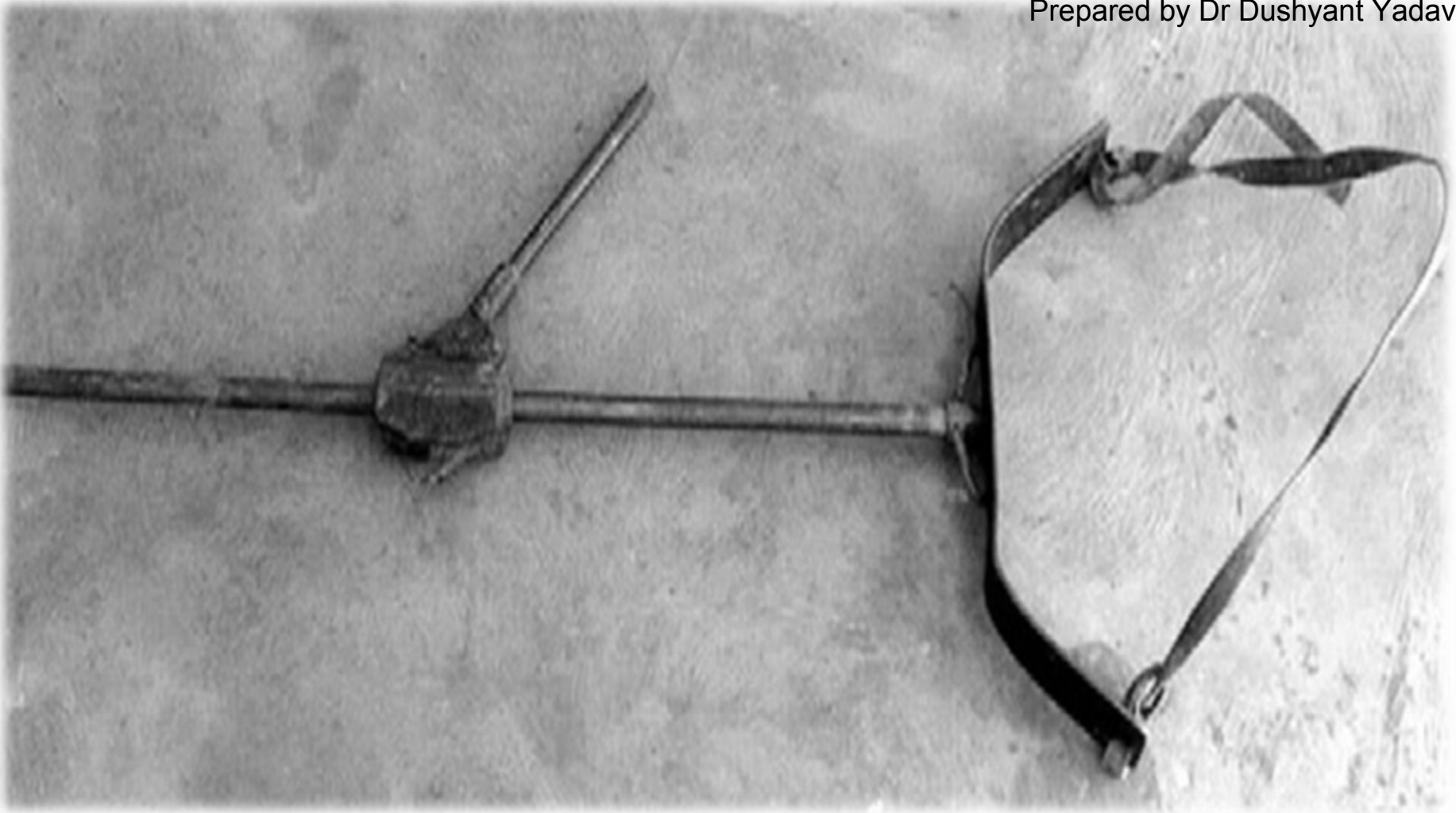


Fig: Mechanical Fetal Extractors

(Useful for applying traction when minimal human assistance is available)

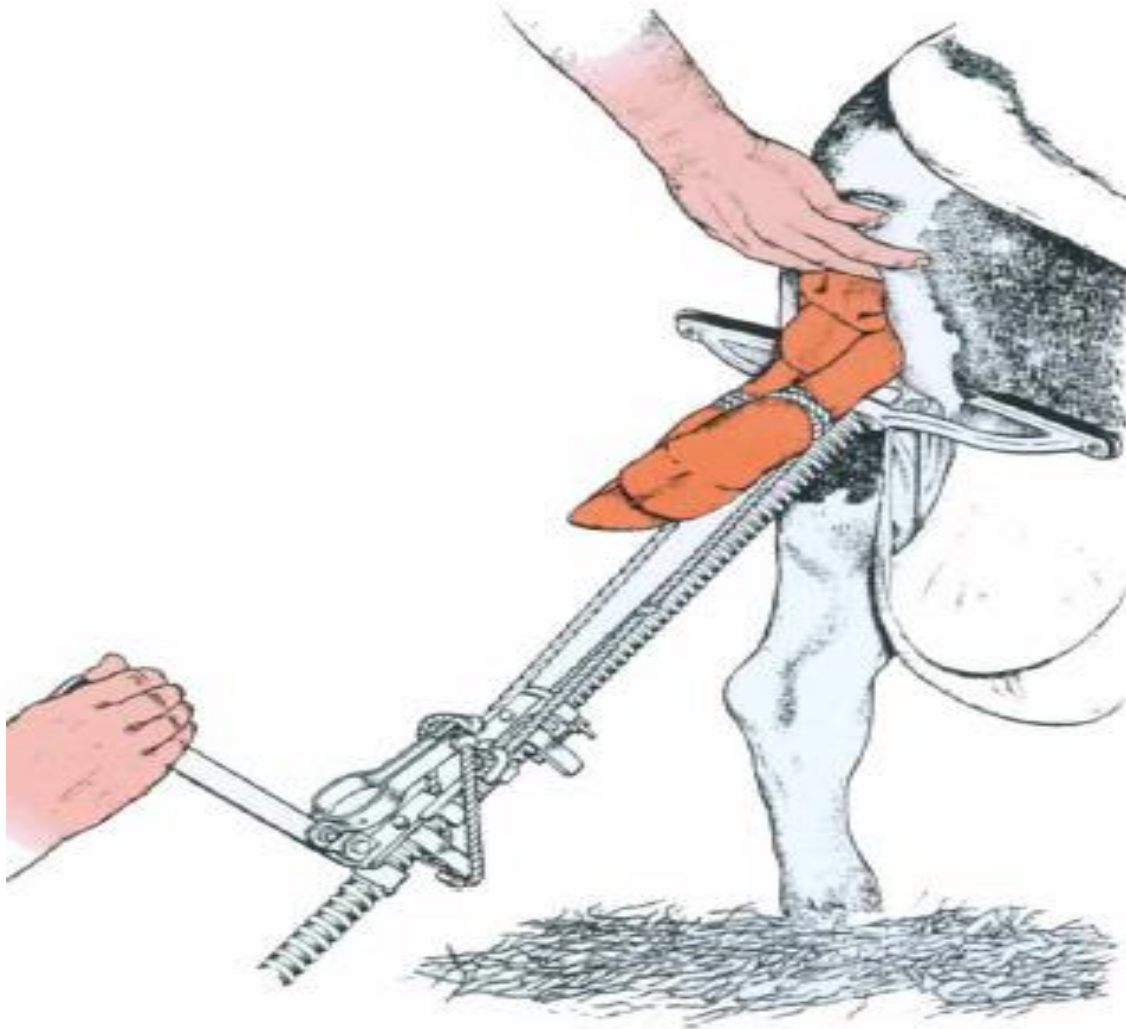


Fig: Assisted delivery of calf using **HK Calving Aid**



Fig: Delivery of Calf using a Vink Calving Aid

Advantages of Delivery in Lateral Recumbency

- Movement of the pelvis is easy leads to maximum movement of pubic symphysis
- Reduces gravitational effect
- Dam can more effectively apply the abdominal press
- Mechanical assistance can be applied more efficiently
- Reduces contamination of perineum etc.

Delivery by Pelvic Symphysiotomy

- Used to deliver oversized fetuses from underdeveloped beef heifers less than 26 months of age
- It is not indicated in older animals or in dairy heifers
- Although the technique is effective, it lacks aesthetic appeal and may not be acceptable to some clients
- **Objective** of the procedure is to **split the pelvic symphysis and allow the pelvic canal to expand** while traction is exerted on the fetus

Procedure:-

- Dam is restrained
- Desensitized perineal area with an epidural anesthetic
- An incision is made on the midline ventral to the vulva
- Give a blunt dissection until the caudal border of the ischium is reached
- Operator places one hand in the vagina as a guide and with the other holds the blade of a heavy chisel against the symphysis

- Split the symphysis by lateral pressure on the shaft of the chisel
- As the fetus is extracted, the halves of the pelvis are separated and the birth canal is allowed to expand
- Skin incision is not closed but allowed to heal
- Patient is confined to a box stall for 10 days after surgery
- Antibiotics and other supportive treatments are administered

***THANK
YOU***