Small Ruminant Field Caesarean Section

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Small Ruminant Cesarean Section

Indication: Vaginal Delivery Not Possible

- Fetal / maternal size mismatch
  - fetal oversize- primiparous ewes, singletons
- Incomplete cervical dilation- “ringwomb”
- Vaginal prolapse
- Pregnancy toxemia
- Malpresentation
- Prepubic tendon rupture
- Fetal monster
- Uterine torsion
- Uterine inertia (hypocalcemia)
- Hydrops
- Uterine/vaginal tears

Prepubic Tendon Rupture

Goiter

Shouldn’t just be a last resort

- Make decision without delay
  - Fetal heart rate <110 BPM
- Prolonged manipulation
  - Trauma
  - Stress and distress
- Economics
  - Live offspring
  - Live ewe/doe
  - Ewe/doe reproduces next year
- Pygmy & Nigerian Dwarf Goats

Survival

Lamb/kid Survival

- Poor prognosis <130 days gestation

Ewe/doe

- Live lambs/just dead: 97.1% ewe survival rate (Scott, 1997)
- Necrotic lambs: 57.1% ewe survival rate (Scott, 1997)
- Subsequent fertility not affected!

Herd goals

- <10% assisted births (herd manager anxiety)
- <5% dystocia (ewe anxiety)
- <1% c section
- D. Anderson

Materials Needed

- Sterile surgical pack
- Suture- 0 & 1 absorbable, non-absorbable for skin
- Surgical drape-sterile
- Clipper
- Surgical scrub and alcohol
- Sterile surgical gloves
- Lidocaine
- Antibiotics
- Flunixin meglumine
- Towels & assistants to dry lambs
- Warm fluids for flushing abdomen

Anesthesia needs

- Injectable Analgesia
- Epidural
  - Lidocaine + xylazine
- Local block
  - inverted L

Lidocaine

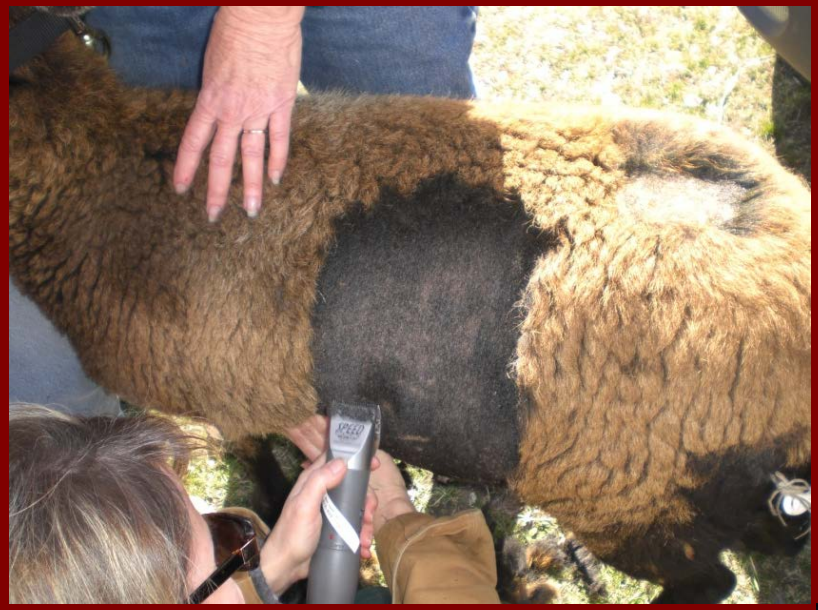
- More Sensitive!
- Maximum <u>TOTAL</u> (blocks + epidural) <u>safe</u> dose (~1 ml/4.5 kg bw)

5-6 mg/kg

- Buffer with Sodium Bicarb
  - 1:10 dilution

Preparations

- Epidural
  - +/- sedation
- Peri-operative antibiotics
- Preemptive pain control
- Treat underlying problems

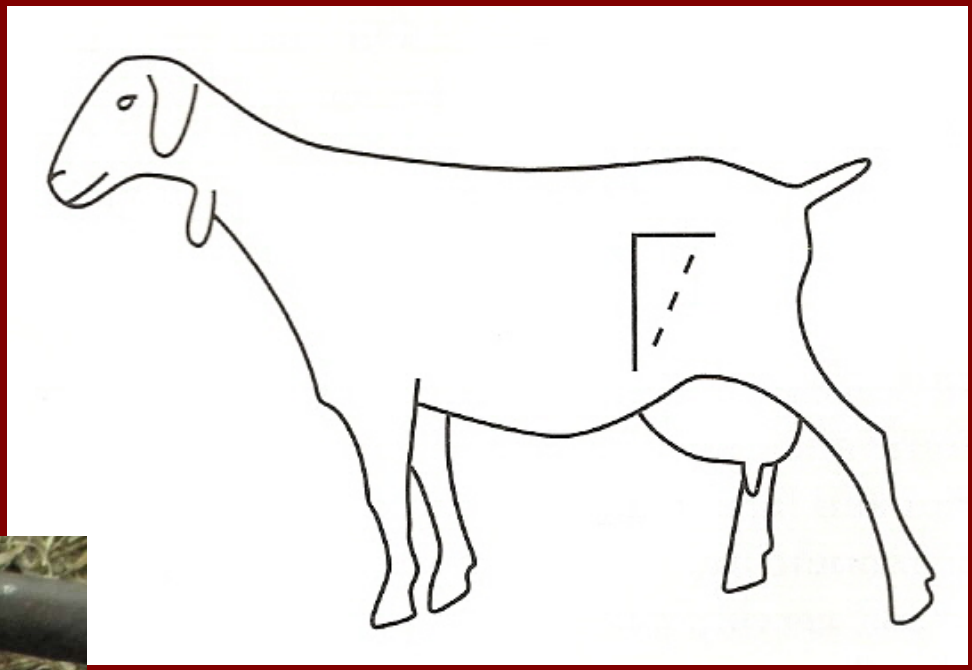


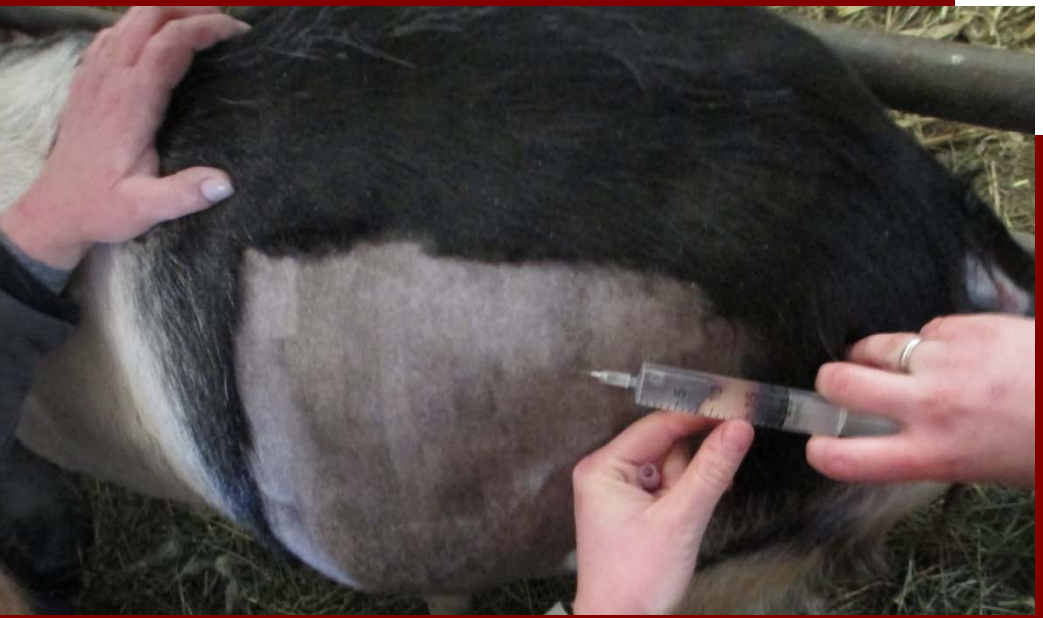
- Left flank shaved and surgically prepped.

- Right lateral recumbency
  - “table” & restraint
- Inverted L block (if needed)
- Surgical Drape

Inverted L block

- Duration: ~ 1.5 hours
- No visceral anesthesia
- May not provide full anesthesia of deep layers & peritoneum

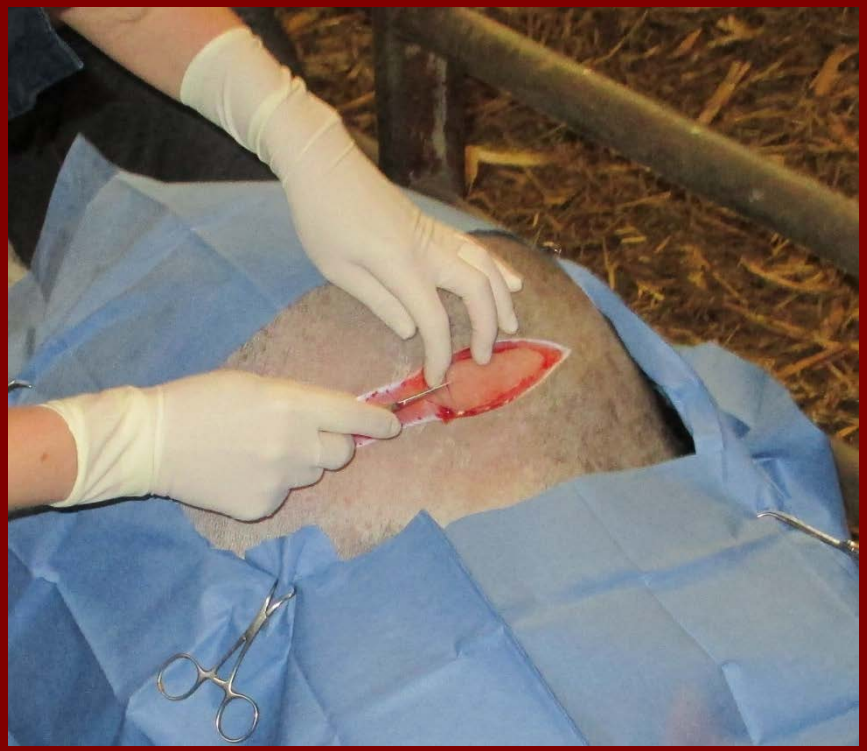


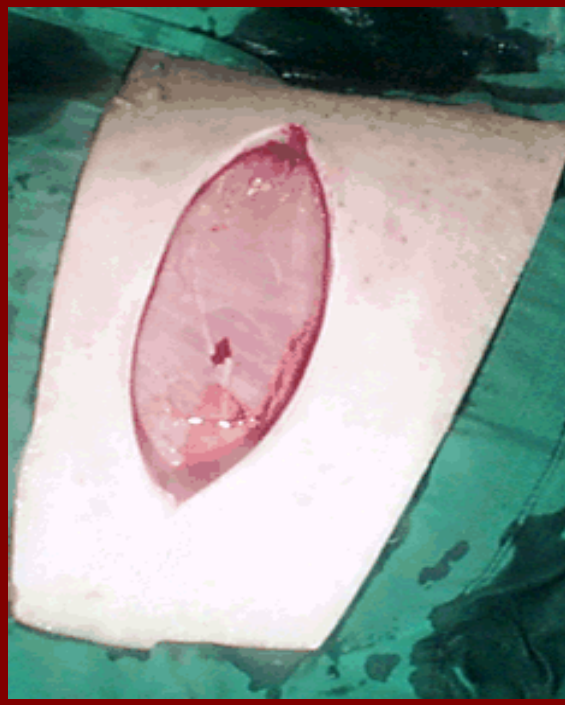


Procedure

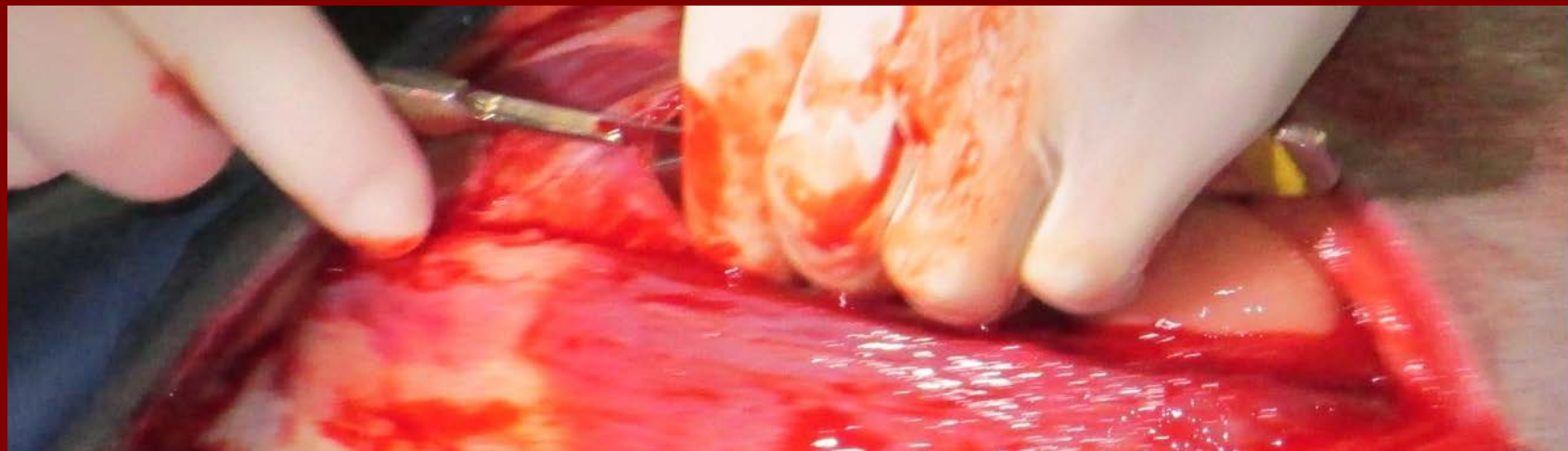
Left flank skin and sq incision

- Straight or oblique
- 12 – 15 cm long
- Midway between the last rib and the wing of the ilium
- 5-10 cm below the level of the transverse

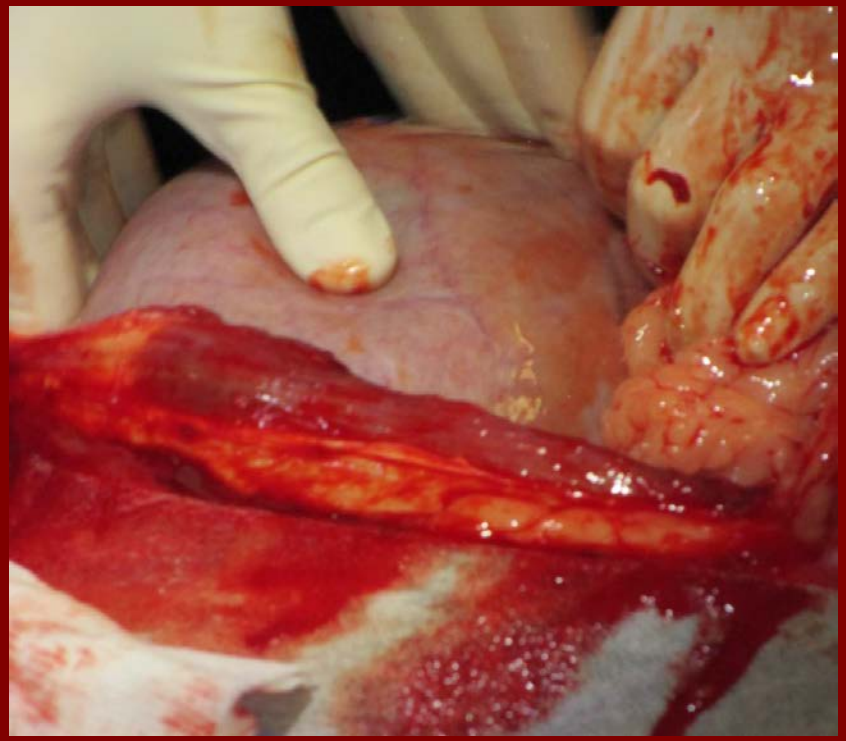




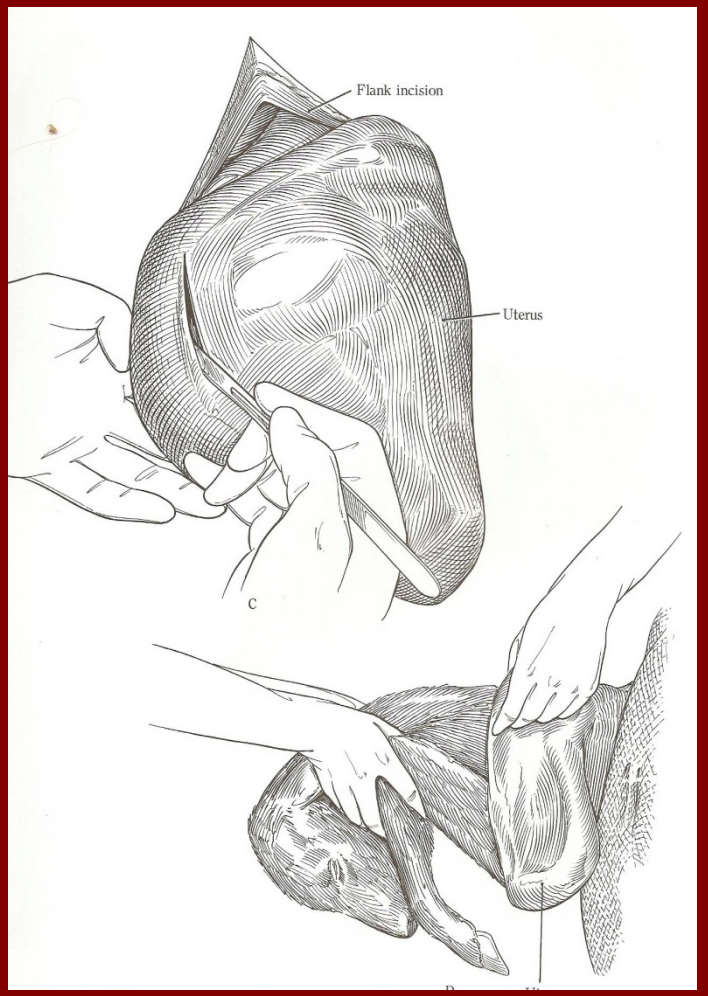
- External & internal abdominal oblique's incision follows skin incision
- Peritoneum
  - Closely adhered to transverse muscle layer
  - Raise and nick



- Locate closest uterine horn
- Draw to incision site and exteriorize
  - Be careful with uterine *wall*- esp. if necrotic/edematous / friable
- Identify & grasp fetal limb

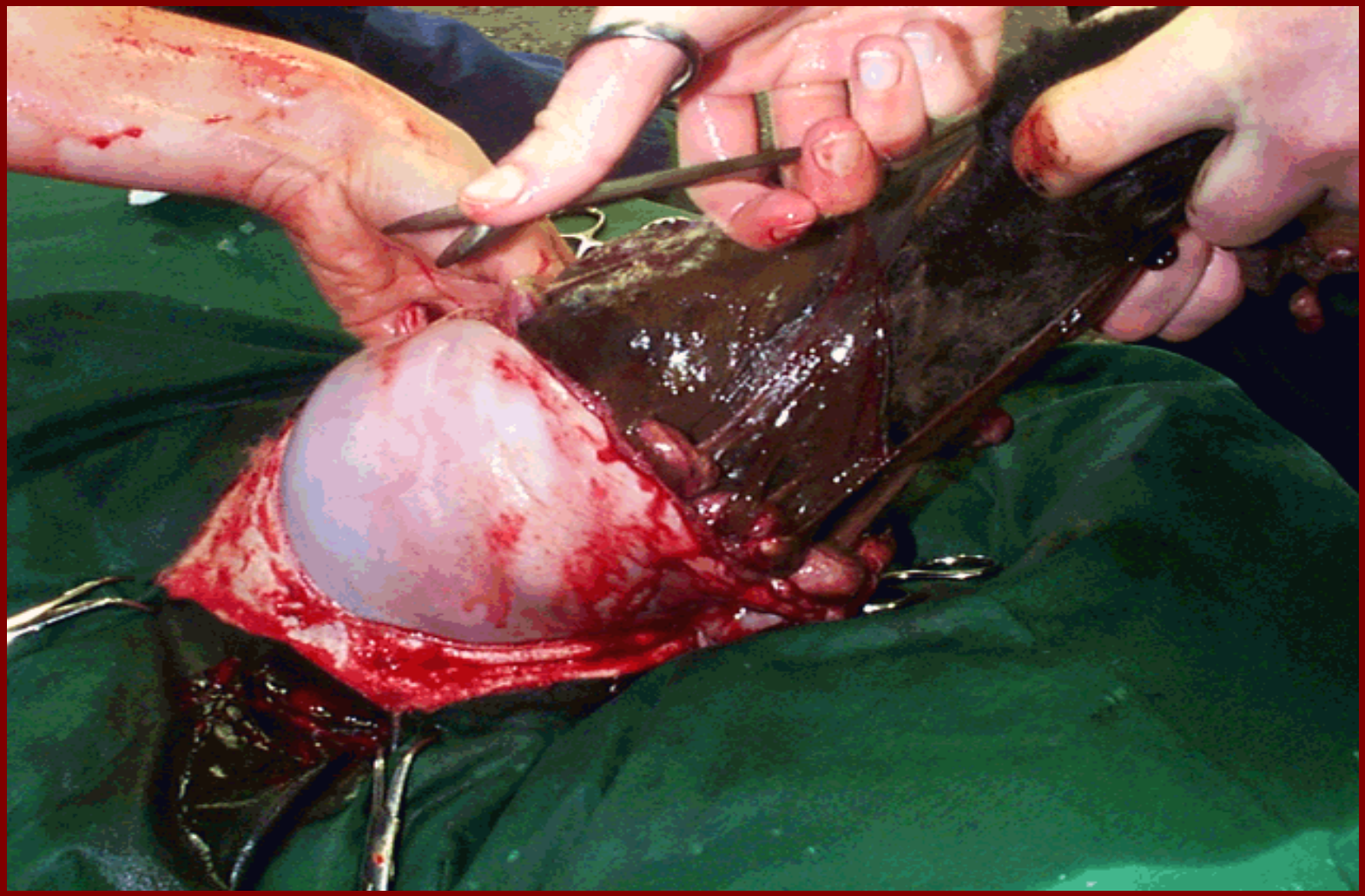


- 10-12 cm incision in body of uterus over fetal limb
  - Long enough
  - Avoid cotyledons



- Deliver lamb thru surgical incision
- Prevent contamination of abdomen with uterine fluids
- Cord can be gently torn or ligated

Don’t let the uterus rip!



•Photo: Phil Scott

- Deliver subsequent lambs thru same incision
- No need to remove placental membranes
  - ensure not sutured into uterine

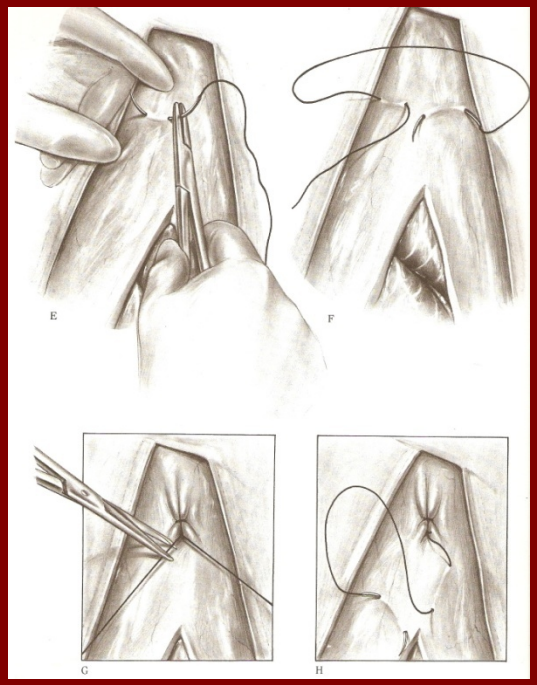
Lamb Care

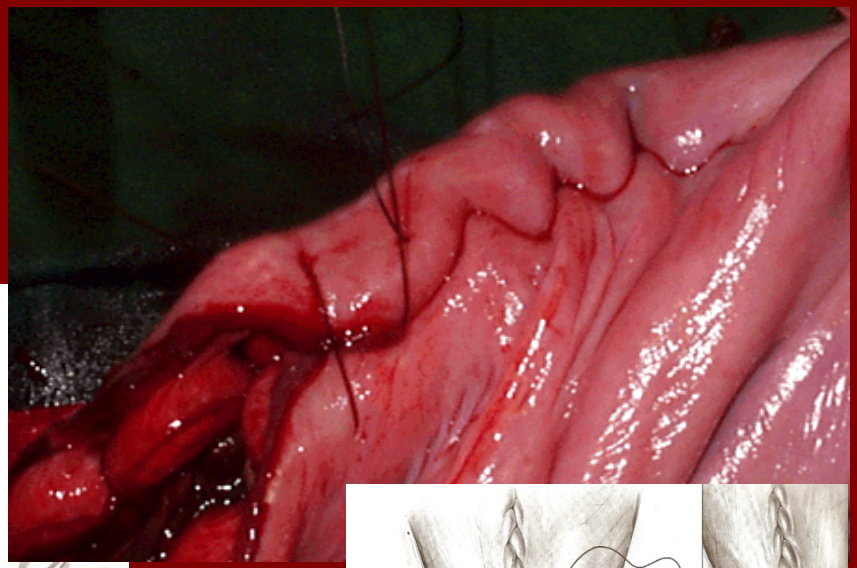
- Assistants
- If needed
  - Resuscitate
  - Dry
- Ewe/doe may start mothering

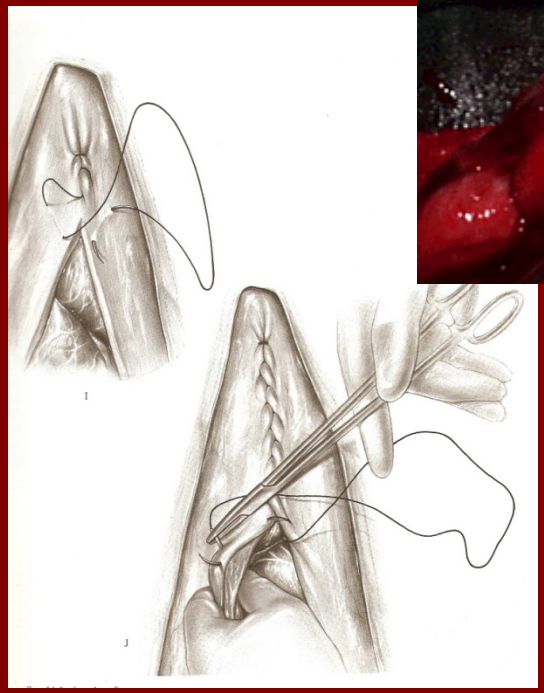
Uterine Closure

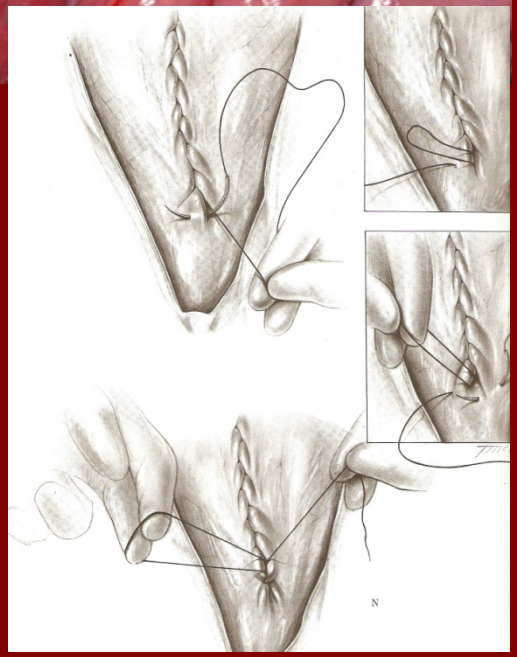
- Be Gentle!!!
- Serosa to serosa contact = quick seal
  - Heals side to side, not lengthwise
  - Double layer, inverting pattern
    - Utrecht, Cushing, (Lembert)
- Suture
  - Taper needle
  - 0 or 1 Absorbable
    - Poliglecaprone (Monocryl®) loses strength in one week in infected tissues
      - Healhty uterus. NOT linea / abdominal wall
    - Polyglactin (Vicryl ®)– braided=more tissue drag
    - PDS- maintains strength longest

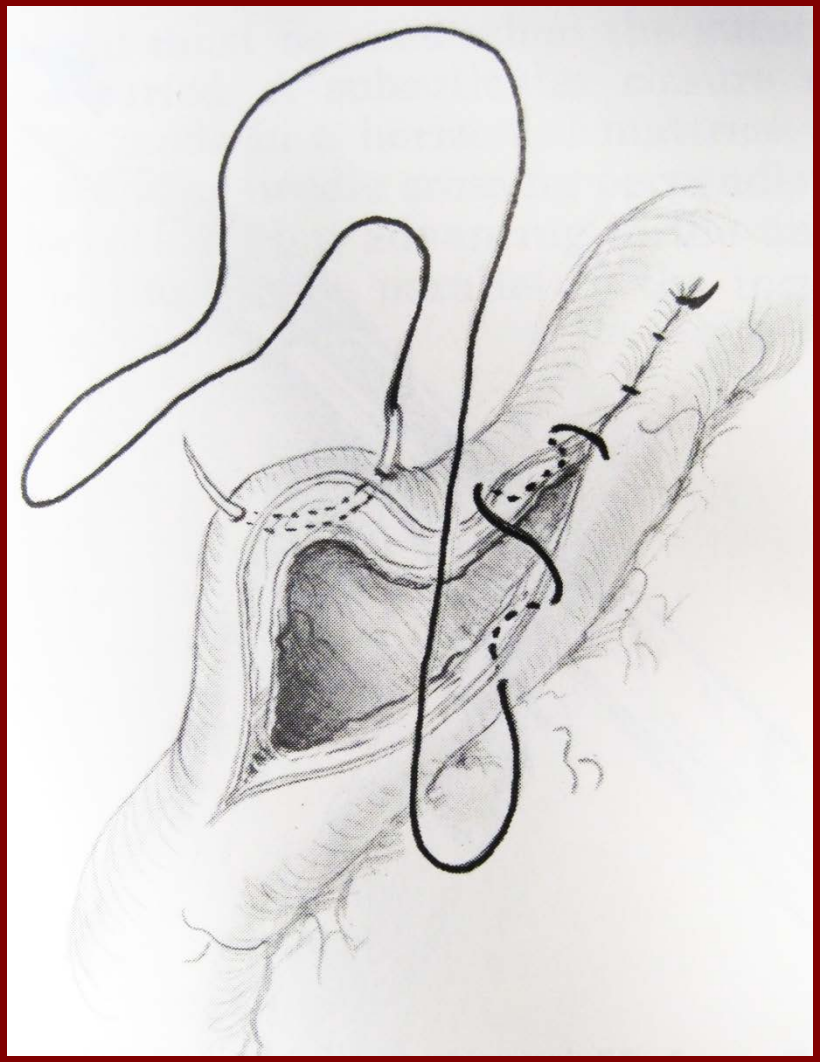
Utrecht

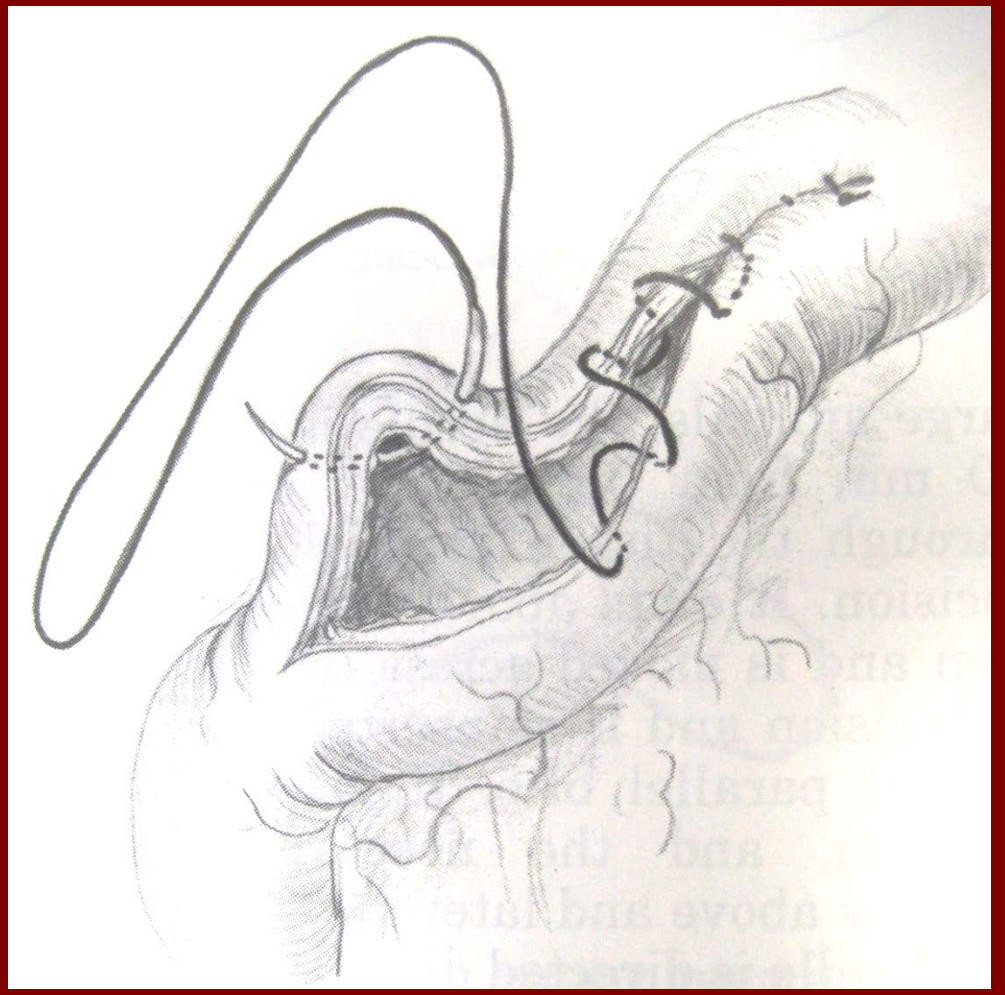






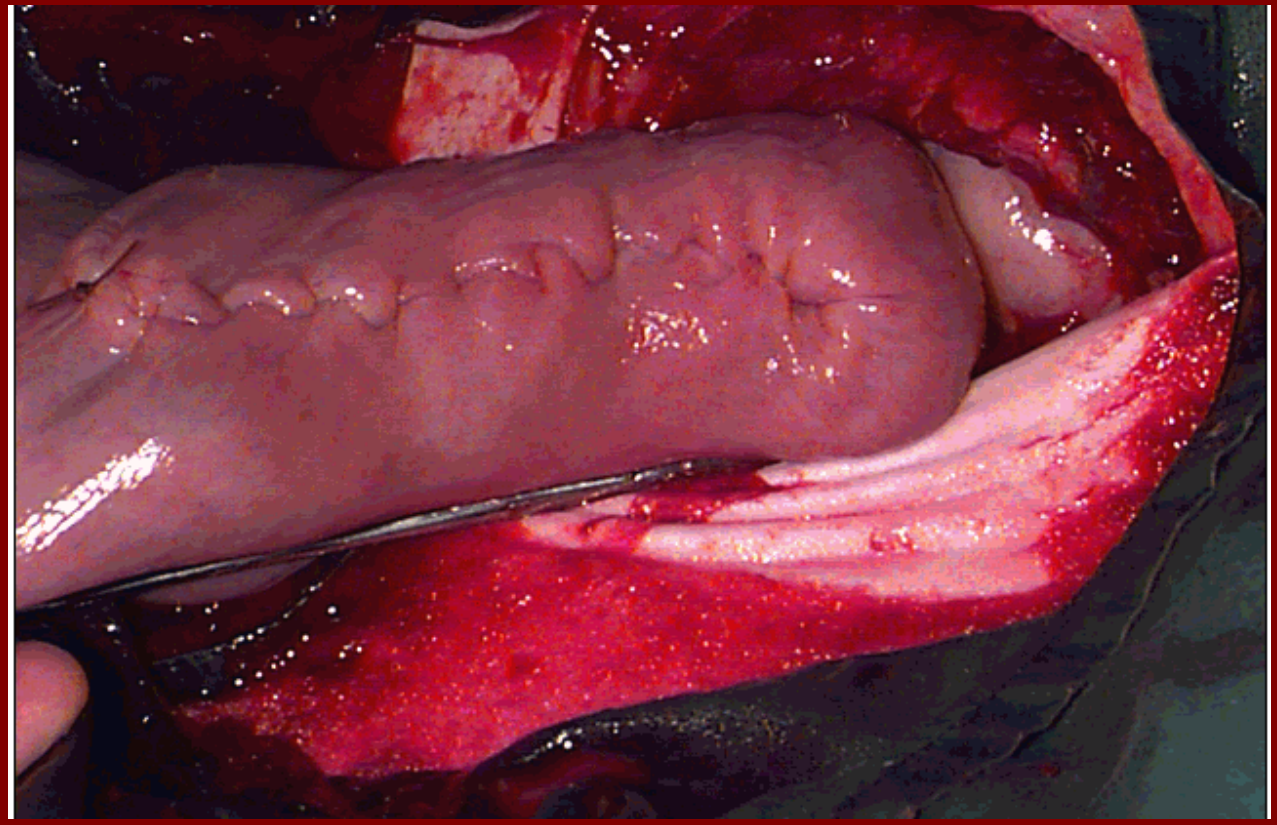






•Cushing

•Connell

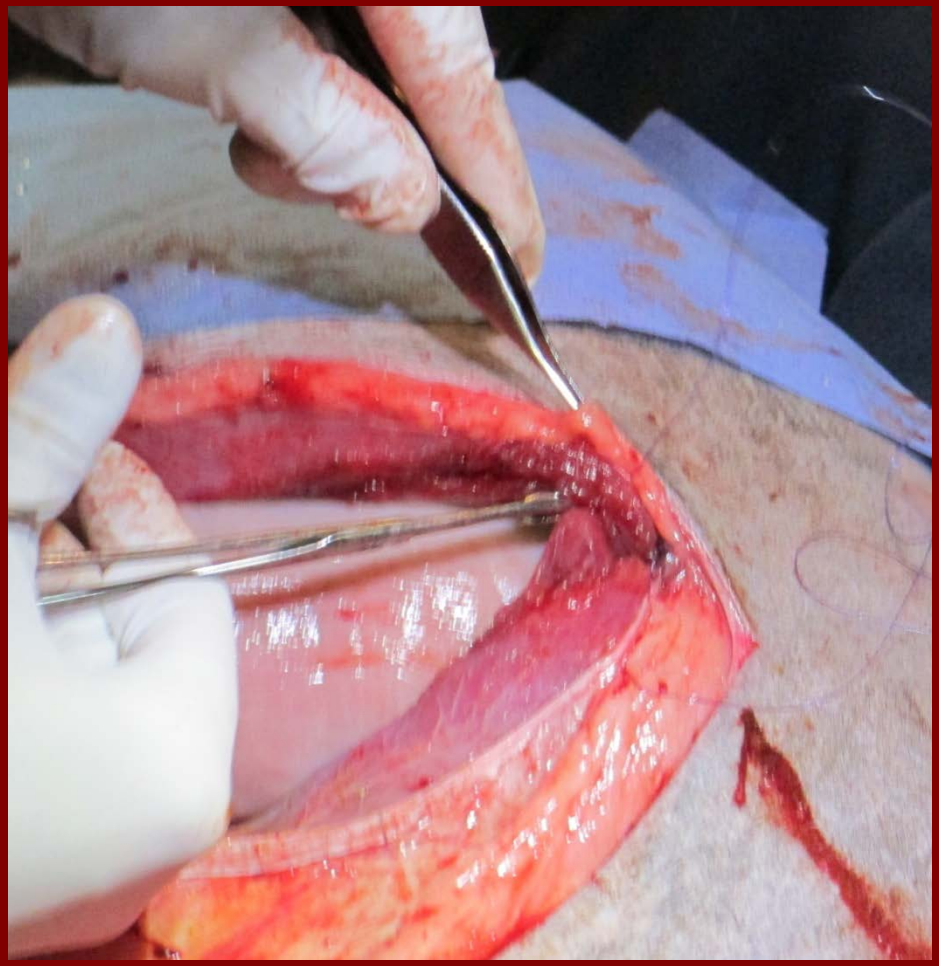


- Check integrity of suture line
- Gentle handling of surface of uterus
- Gently place uterus back in normal position
- Flush abdomen with warm saline
- Adhesions due to bacterial contamination and tissue trauma!

Abdominal wall closure

- Transverse/peritoneum-
  - #0 to #2 absorbable*
  - simple continuous
- Internal & external obliques
  - #0 to #2 absorbable *
  - simple continuous
- Skin- *choices*-
  - staples, SI, ford interlocking-
  - 0 non absorbable

*PDS, Vicryl®, Not Monocryl®



Post op

- No oxytocin needed
- Mother up
- Antibiotics & NSAID- 3-5 days
  - Slaughter withdrawal
- Supportive care if toxic/ketotic
- Suture removal in ten days

- Subsequent fertility not affected
- Typically don’t need C section next year
- Cull vaginal prolapses and ringwomb- potentially heritable traits

Special Goat Considerations

- Goats tolerate pain much less than sheep.
- Recommend gas anesthesia
- In field,
  - both epidural and local block
  - injectable pain control and sedation.
- Strongly recommend IV catheter
  - fluids running during surgery
  - venous access for drugs
- Treat goats for shock immediately post op.
- Solid post operative pain control

Tips for better outcomes:

1. Do not delay decision
2. Goats require more aggressive pain management.
3. Provide local anesthetic and pain control. Remember lidocaine safe limits of 1 ml 2% lidocaine/ 4.5 kg (10 lb.) BW.
4. Caudal epidural- grasp high up under tail
5. Generally, 2 ml of 2% lidocaine + 0.25 ml of 20 mg/ml xylazine for average size ewe
6. Hanging drop usually does not work -feel for the “pop” & lack of injection resistance.
7. Body wall is relatively thin
8. Always shave 8 cm more ventral
9. Make your skin incision 5 cm longer ventrally
10. Do NOT allow the uterus to tear.
11. Check the 2nd horn for another fetus.
12. Double layer inverting closure of uterus with monofilament absorbable suture on taper needle.
13. Avoid contaminating & flush abdominal cavity
14. Systemic antibiotics and NSAIDs for 3-5 days post op.

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