

De hyppigste
postpartum problemer
hos hoppen

Retained Foetal Membranes

Treatment options and considerations

Retained placenta/retained foetal membranes

Pathology if no expulsion within 3h post-partum
> 8h – considered as life threatening emergency

Occurrence:

- 2-10.5 % of foalings
- Higher in Friesian mares and draft horses (up to 54%)

Medical management

- Therapeutic oxytocine
- NSAIDS
- Broad spectrum antibiotics
- Prevention of
 - endotoxaemia
 - laminitis

Treatment - oxytocin

Oxytocin therapy as soon as a diagnosis is made

Sometimes, a single injection of **10–20 IU**, IV can result in membrane passage within minutes (but most often the results are not so dramatic)

Treatment regimen:

- Bolus injections 10-20 IU IV or IM q 30 min – 2h, for 6h or until the membranes are out
- Continuous infusion – 60-100 IU in 1 L RA or saline, administered slowly IV (30-60 min)

If the mare begins to show signs of discomfort (uterine contractions) then the dose and/or frequency is reduced.

If membranes don't pass within 12 h, it is common for the membranes to be retained for days until they necrose and fall away from the endometrium



Active removal

Advantages:

- Reduced risk of metritis/endotoxemia/laminitis complex
- Reduced risk of uterine horn eversion (particularly in mares with heavy membrane)
- Full evaluation of the foetal membranes
- Early institution of therapy in the case of membrane abnormalities



Active removal

Risks:

- Increased risk of haemorrhage when separating the microvilli from the endometrium
- Tearing membranes during removal
- Retained microvilli, which can provide environment for infection
- Uterine horn eversion/intussusception or prolapse

Manual removal

Manual removal

Contraindicated to forcibly extract retained membranes

Attempt can be made with controlled pressure and digital separation of the placenta; repeatedly applied in a cranial direction toward the tip of the attached uterine horn to encourage passage of the membranes by applying gentle pressure

When membranes stop detaching readily from the endometrium, the procedure should be discontinued and the mare reevaluated in 15 to 30 minutes



Manual removal

Small study – 17 mares

5 mares

Spontaneous delivery

Success rate:

9/12 (75%) Full separation without complication

3/12 (25%) Complications (n=2 uterine horn eversion, n=1 uterine prolapse)

Small study where they used described technique – induced placentitis

Rather irrelevant study

Very few relevant studies

No standardized method

Critically Appraised Topic

In the mare, does manual removal of fetal membranes negatively affect fertility?

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Background

Retained fetal membranes (RFM) are the most frequently occurring post-partum condition of the mare encountered in clinical practise (Threlfall 2011). The condition is defined as the retention, complete or partial, of the allantochorionic membrane for an extended period of time following expulsion of the foal. The vast majority of publications agree that fetal membranes (FM) should be considered pathologically retained if they have not been expelled within 3 h post-partum, at which time it is considered appropriate to

question were identified. These papers comprised of two clinical trials (Sevinga *et al.* 2002; Cuervo-Arango and Newcombe 2009) and a single cohort study (Ishii *et al.* 1999).

Quality of evidence

All studies included primarily (Cuervo-Arango and Newcombe 2009) or exclusively (Ishii *et al.* 1999; Sevinga *et al.* 2002) heavy draught breed mares. The study by Ishii *et al.* (1999) lacked power (n = 10) and did not include any relevant calculations of significance. Similarly, Cuervo-Arango

Manual removal and fertility

Review paper from 2020 on manual removal of retained placenta

Conclusion

Manual removal of RFM has previously been discouraged based primarily on anecdotal and observational evidence. The three recent publications on the effects of manual removal of FM on mare fertility that have been discussed in this article, do not support these long-held beliefs. Further investigations, especially in light horse breeds, are warranted. Evaluation of FM removal techniques and time of removal relative to parturition would be essential if manual removal is to be considered in a routine treatment protocol for RFM in the mare. However, the manual removal of RFM should be considered in relation to substantially proven and successful techniques, such as those described by Burns *et al.* (1977) and Meijer *et al.* (2015).

Manual removal and fertility

Review paper from 2020 on manual removal of retained placenta

Sevinga et al. (2002) measured an array of fertility parameters (for example pregnancy rate per cycle, pregnancy losses)

and

concluded that there were no significant differences in the outcomes between mares with RFM that were removed manually and those with RFM that expelled the FM spontaneously or following medical intervention.

Cuervo-Arango and Newcombe (2009) measured the accumulation of free intrauterine fluid, as well as pregnancy rate at first service and pregnancy rate at the end of the season

These authors also found no significant differences between mares that had early manual removal of FM and those that passed FM naturally. They concluded that early manual removal of FM has no detrimental effects on subsequent fertility of the mare.

Manual removal and fertility

In conclusion:

- No strong evidence against manual removal
- No well recognized and proven method for manual removal
- Lack of data on light horse breeds

Burns technique

Burns et. al., 1977

Burns technique

What is needed:

- Stomach tube
- Stomach pump
- Bucket
- Water
- Povidon-iodine solution

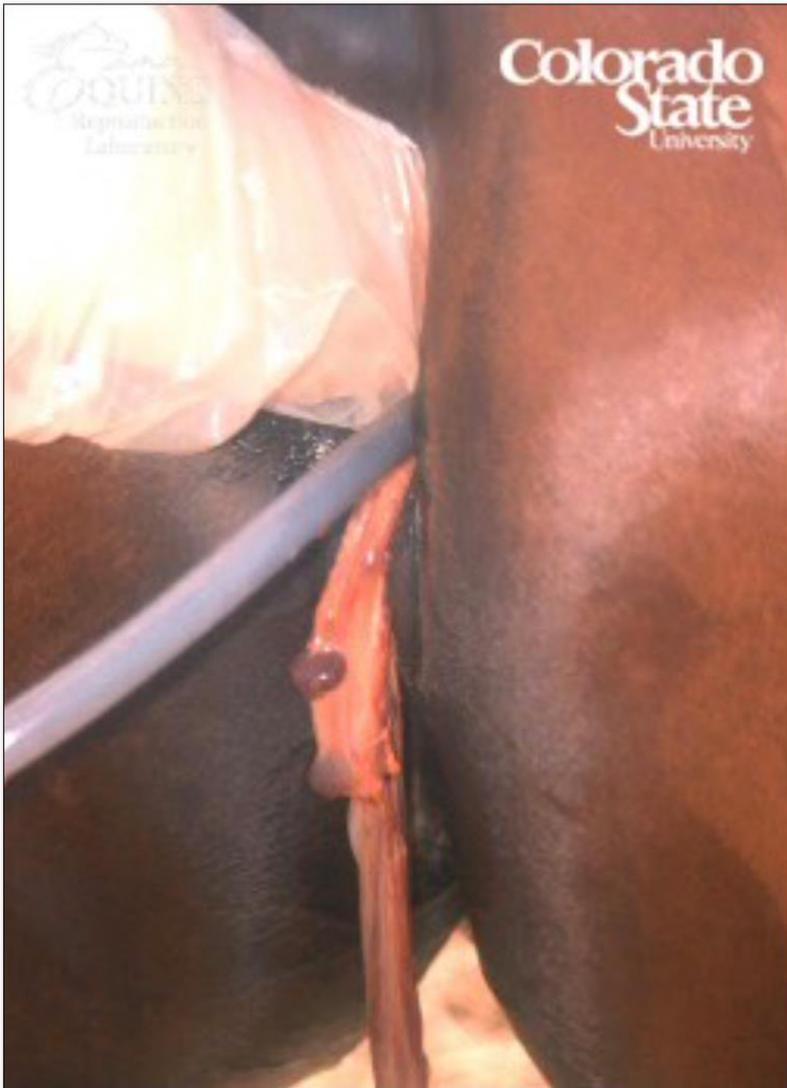


Figure 14. Passing a stomach tube along the umbilical cord into the allantoic cavity.

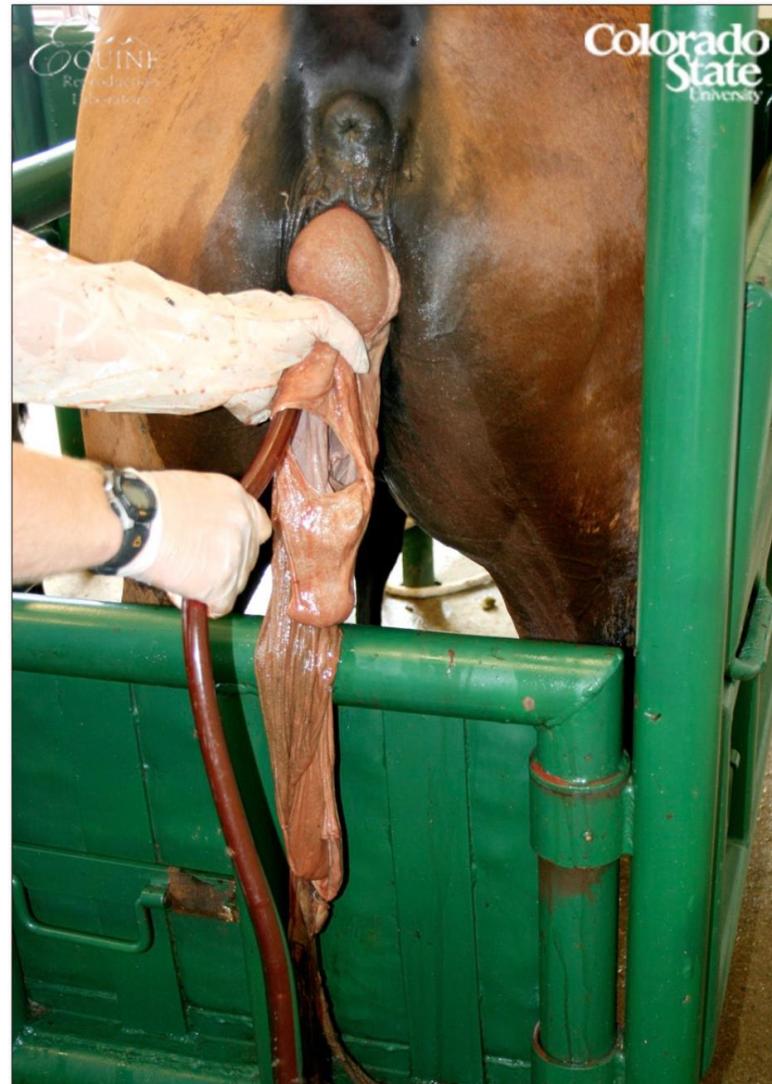


Figure 15. Chorioallantoic membrane being removed from the uterus using the water technique. Note the left hand grasping the chorioallantois around the stomach tube.

Burns technique

Burns technique

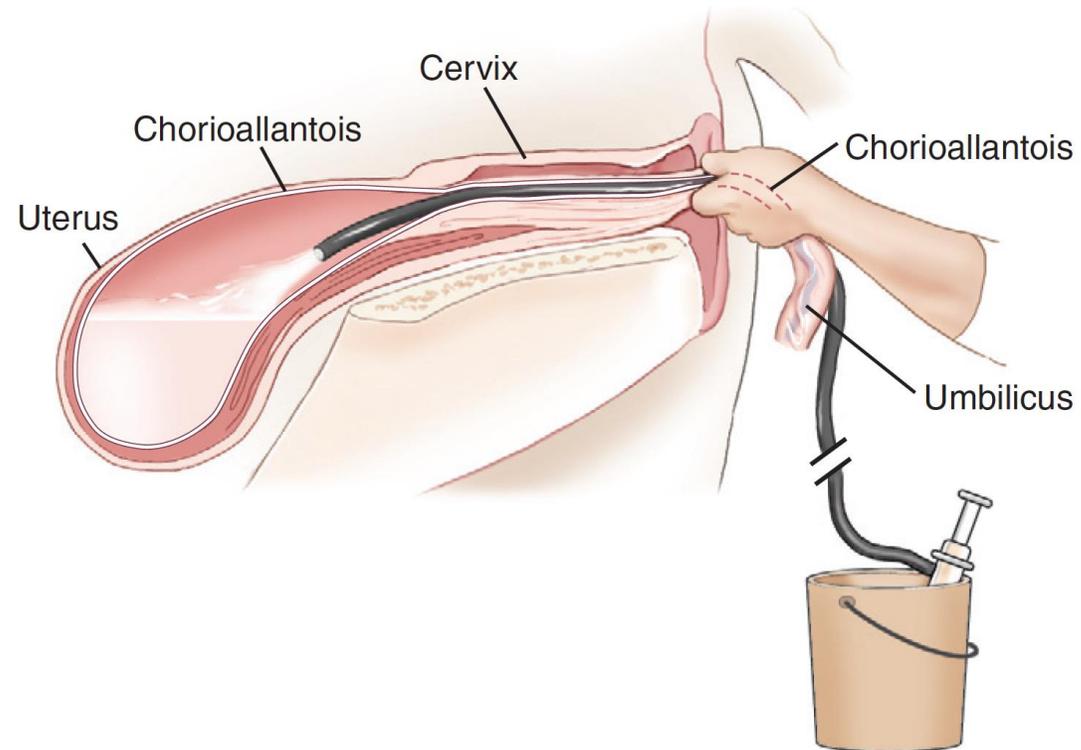


Figure 10-5 Distention of chorioallantoic cavity with fluid to promote expulsion of placenta.

Dutch technique

Meijer et. al., 2015

Dutch technique

Described on 147 broodmares

Use of umbilical artery or vein

Success rate:

135/147 (91.8%) Full separation and expulsion within 5-10 minutes

8/147 (5.4%) Expulsion within 15 to 30 minutes

Failure in 4 mares (2.7%) – incomplete separation and tearing of the membranes



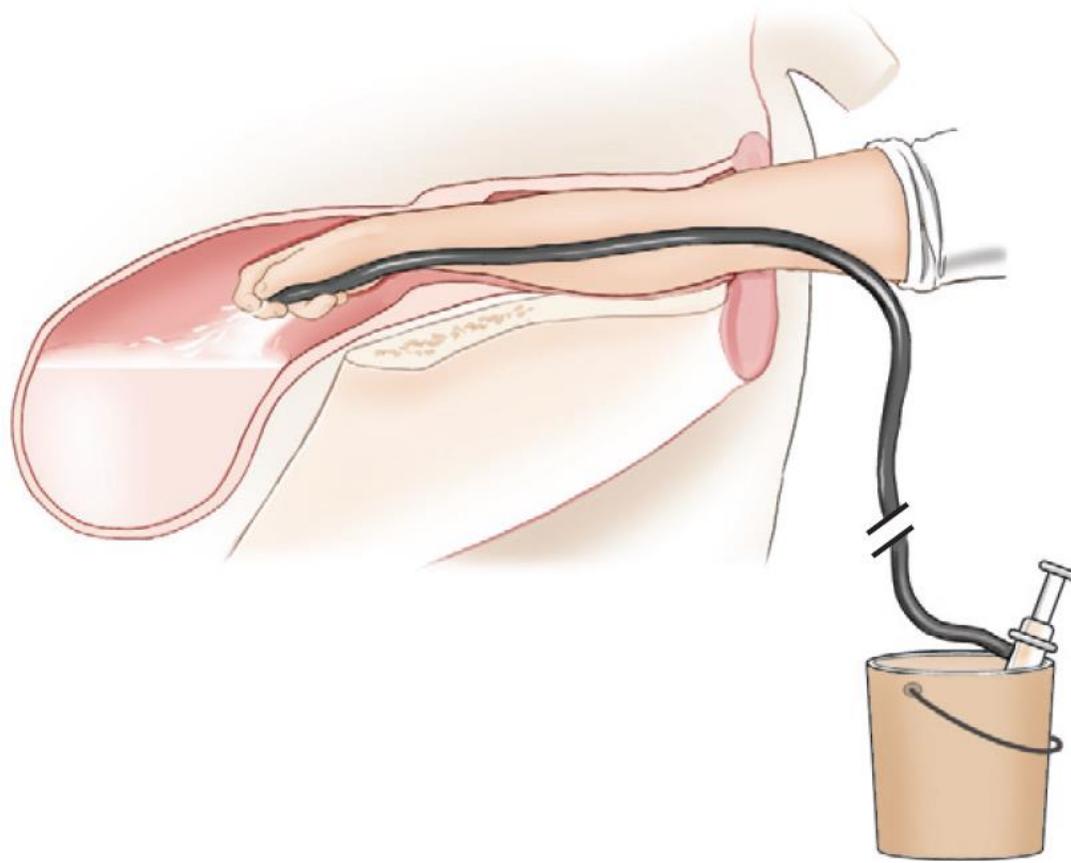
Fig. 1. Garden hose adapter (Dutch version) attached to foal nasogastric tube.



Dutch
technique
(Meijer et al., 2015)

Nageboortebehandeling methode Zeddham

Large- volume uterine flush



Large-volume uterine flush

Figure 10-6 Technique used for lavage of the uterus of the postpartum mare. The hand should be cupped around the end of the tube to avoid injury to the uterus from the siphoning action.



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Original Research

The Effect of Uterine Lavage on Soluble CD14, Chemokine Ligand 2, and Interleukin 10 Levels in Mares With Postpartum Metritis



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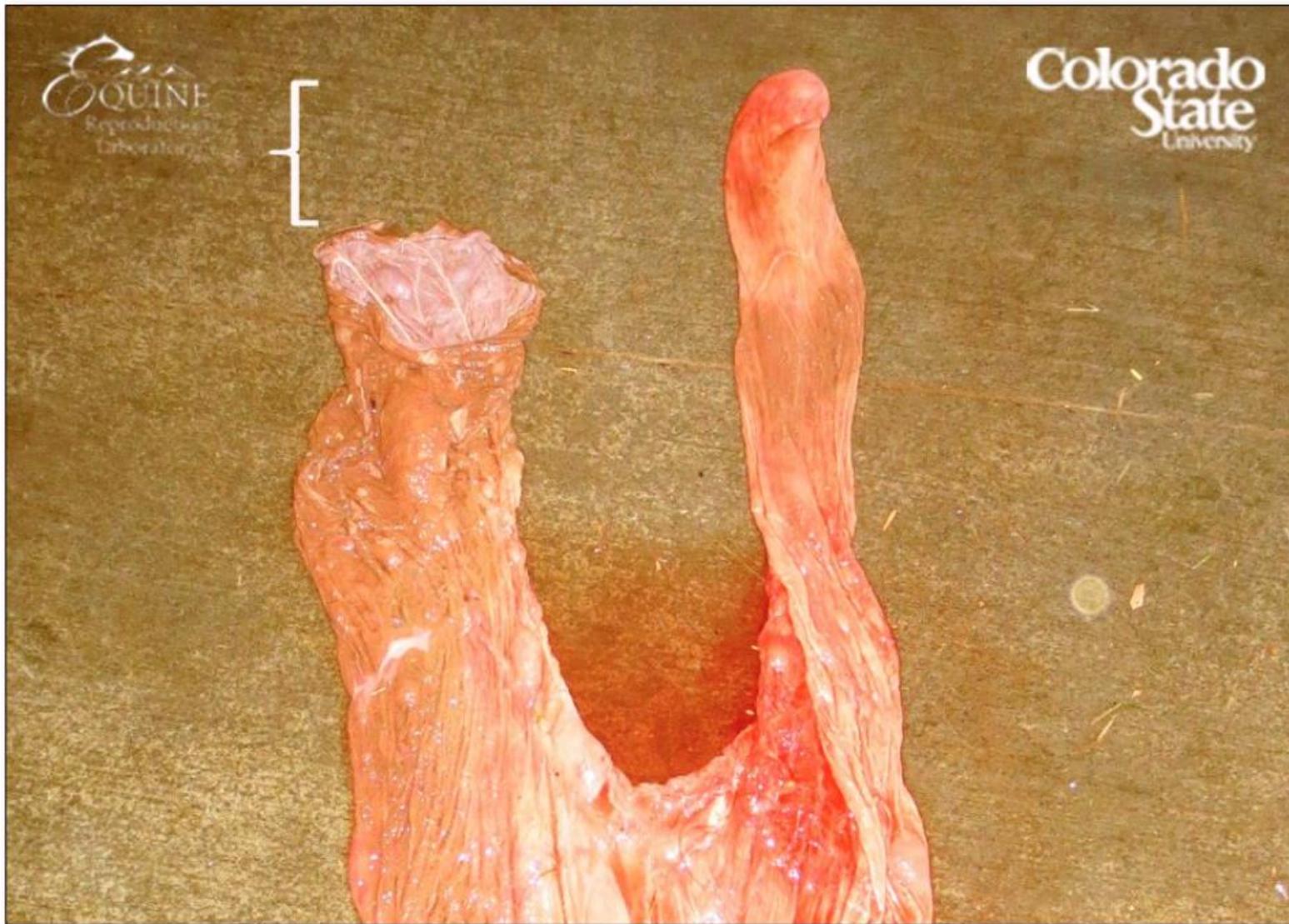
ABSTRACT

Postpartum metritis in mares is a life-threatening condition associated with severe clinical signs due to endotoxemia, and it is often followed by complications such as laminitis. Repeated large-volume uterine lavages are commonly recommended as a part of the treatment protocol to remove endotoxin-laden contents from the uterus. It has, however, also been suggested that lavages may increase the uptake of endotoxin into the circulation, leading to a deterioration of clinical signs. Endotoxemia is associated with the release of a multitude of inflammatory mediators regulating the immune response. The aim of this study was to evaluate if uterine lavage influences serum levels of the inflammation markers soluble CD14 (sCD14), chemokine (C-C motif) ligand 2 (CCL2), and interleukin (IL)-10 in mares with postpartum metritis. Serum samples were collected from eight mares treated for metritis at a university teaching hospital. Mares with fever, tachycardia, and/or leukopenia and hemosanguineous or purulent intra-uterine fluid within 1 week of foaling were included in the study. Serum samples were taken before uterine lavage and 15 and 30 minutes after starting the lavage. The concentrations of sCD14, CCL2, and IL-10 were determined with a fluorescent bead-based immunoassay. There were no significant differences between sCD14, CCL2, or IL-10 levels at different sampling times. Heart rate was significantly lower after uterine lavage than before. The differences in body temperature and leukocyte count before and after lavage were not significant. In conclusion, uterine lavage had no immediate effect on the serum concentration of sCD14, CCL2, or IL-10, nor did it affect clinical parameters negatively.

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Large-volume uterine flush

Placenta evaluation



Placenta evaluation

Figure 9. Placenta with the tip of the non-pregnant horn missing (white bracket).

Review Article

Equine placenta – A clinician's perspective. Part 2: Abnormalities

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Keywords: horse; placenta; mare; fetal membranes; placentitis; retained; burns technique

Summary

Any insufficiency of the equine placenta has dramatic effects on the developing equine fetus. Placental abnormalities, such as the separation of the chorioallantois from the maternal endometrium or torsion of the umbilical cord, lead to fetal demise, premature labour or abortion. These conditions are each associated with characteristic lesions on the equine placenta, which can be found during a detailed examination. These findings can be very helpful for diagnosing problems and implementing appropriate treatments for mares and affected newborn foals. Furthermore, the retention of the entire placenta or any small fragment thereof can cause metritis, laminitis and sepsis. The prompt diagnosis and aggressive treatment of this condition is necessary to save the mare from becoming seriously ill. Therefore, a thorough evaluation of the equine placenta is a crucial element of the post partum evaluation of every brood mare.

normally occurs during the last few days of pregnancy (Rossdale and Ricketts 2002). Therefore, premature induction of parturition in mares may lead to 'red bag' delivery and possible fetal loss. One should also consider fescue toxicosis, resulting from digestion of grass infested with an endophytic fungus, *Acremonium coenophialu*, as a possible cause of thickened chorioallantois and a 'red bag' delivery (Cross 2011). This problem occurs primarily in the USA and Canada. Actual separation between chorionic villi and endometrial crypts may happen acutely, during parturition itself, but it may be initiated hours, days, or even weeks prior to delivery, when the disease develops slowly over time. In the case of bacterial infection, bacteria invade the chorioallantois through the cervix, causing ascending placentitis (Calderwood Mays *et al.* 2002; Macpherson 2005). This starts from a thickened, congested chorioallantois at the cervical star, which appears bright red upon evaluation (Schlafer

Placenta evaluation

The following images are courtesy of the crew at Wild Turkey Farm in Wilsonville, Oregon (Figures 30 and 31).



Figure 30. Placenta from a dressage mare.



Figure 31. Placenta from a jumping mare.



Prognosis

Systemic recovery:

In uncomplicated cases without development of secondary complications, the prognosis for survival is excellent. In worst cases - septic metritis and laminitis, death can occur.

Future breeding:

If no secondary problems - prognosis for future fertility is good

The recommendation is not to breed the affected mares on foal heat. The mare's uterus should be examined during first post-partum diestrus and if ok, she can be bred on her subsequent estrus

After Care... What to do

Flush when and how much

Antibiotics

NSAID

Cooling of hoofs



When to go.....

Possible complications



Inversion of a uterine horn

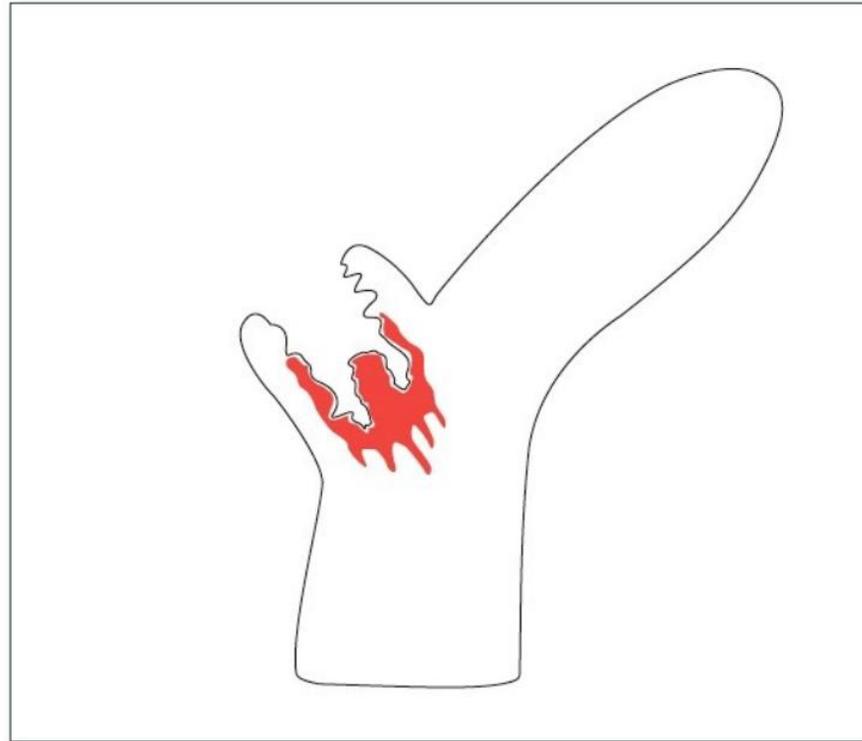


Figure 10. Drawing of a partially inverted uterine horn with the tip of the non-pregnant horn of the placenta (drawn in red) attached.



Figure 11. Inverted wine bottle about to be placed into the uterus of a mare to evert an inverted uterine horn.

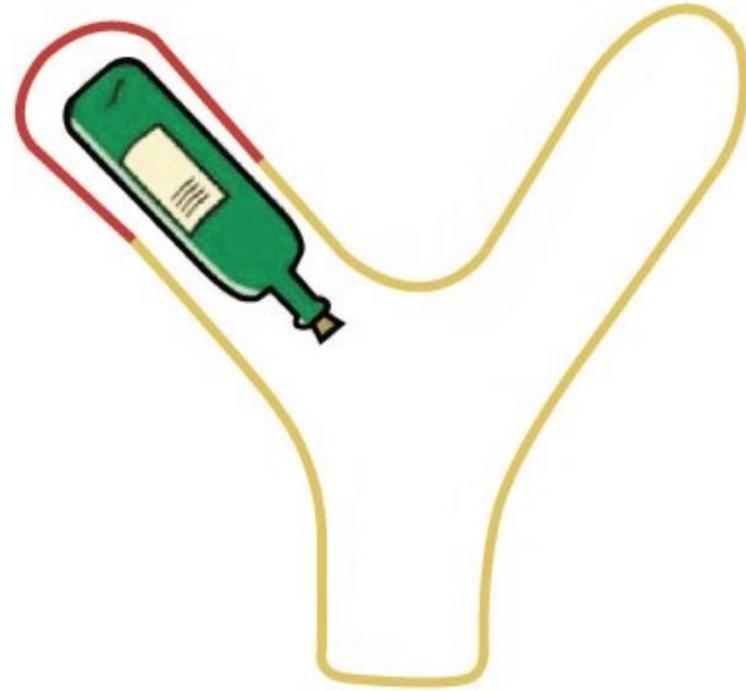


Figure 12. Diagram depicting the use of a sterilized empty wine bottle to evert an inverted uterine horn.



Uterine prolapse

Rectal prolapse

Caused by straining from dystocia

Type IV most often seen in association with post partum mares : peritoneal rectum and variable length of the small colon from intussusception through the anus

Variable amount of tissue inflammation, cyanosis or necrosis

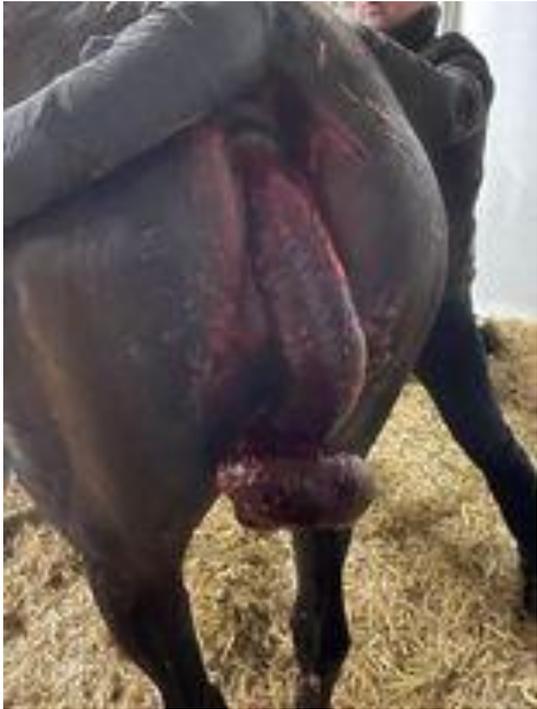
Access through celiotomy limited

Manual reduction if tissues are viable, or resection and anastomosis

Prognosis variable, depending on the degree of prolapse and the amount of damage



3) Rectal prolapse



Other complications

Uterine

- Laceration
- Rupture/tear

Uterine Artery Rupture

Toxaemia

Laminitis

Unresolvable colic

Metritis



Hemorrhage From Uterine or Ovarian Vessels

Usually occurs during parturition

Becomes obvious in the immediate post-partum period, less commonly during pregnancy or several days post-partum

Sites of hemorrhage: middle uterine artery, utero-ovarian arteries or external iliac arteries

Predilection for right-side uterine a. rupture - caecal displacement of the gravid uterus to the left may increase tension on the vessels in the right broad ligament

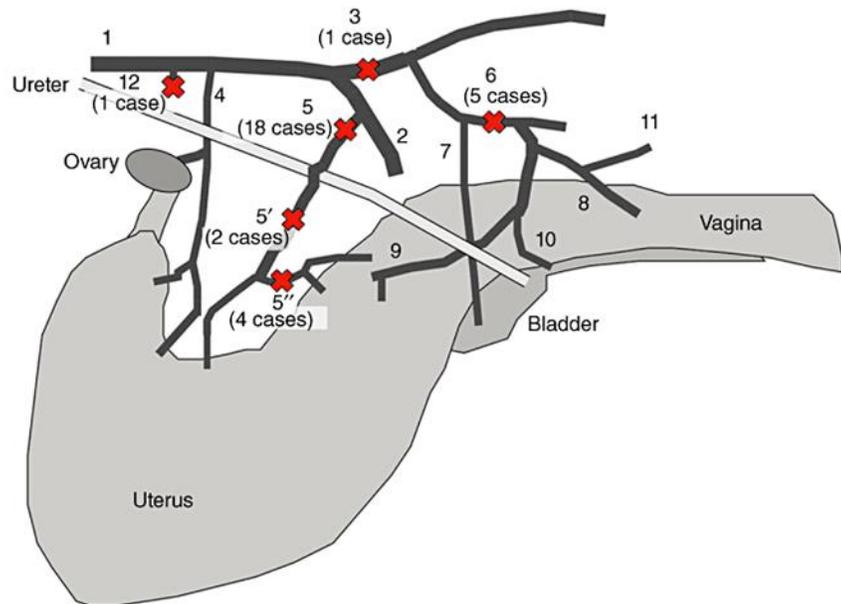
Typically 2–3 cm in length and oriented parallel to the long axis of the vessel

The delivery itself is often uncomplicated

Older mares at greater risk - ‘pregnancy-sclerosis’

Mild cases may go undiagnosed

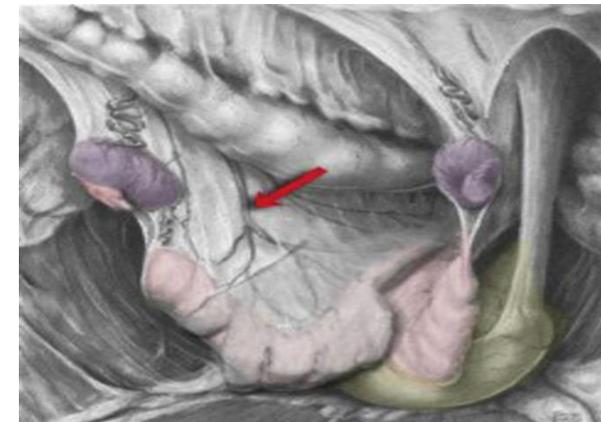
Clinical signs vary, depending on where the rupture is



Pathology of lethal *peripartum* broad ligament haematoma in 31 Thoroughbred mares

T. UENO, Y. NAMBO, Y. TAJIMA, T. UMEMURA

First published: 16 August 2010 | <https://doi.org/10.1111/j.2042-3306.2010.00090.x> | Citations: 17



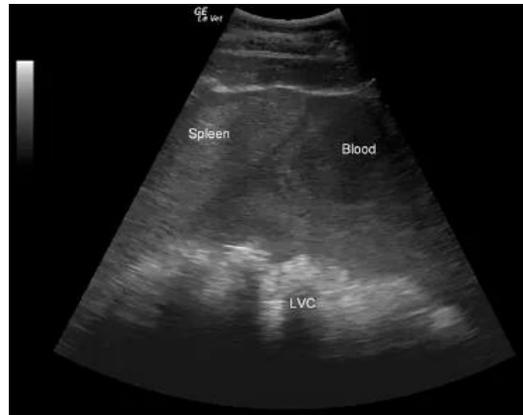
SYMPTOMER

Tachycardia associated with either pain, hemorrhage, or both

Pale mucous membranes (may be normal during the acute phase)

Sweating, curling of the upper lip, muscle fasciculations

Colic



DIAGNOSTIK

Transabdominal ultrasound, abdominocentesis and haematology

PCV not reliable in the acute phase (splenic contraction)

Hypoproteinemia more consistent finding

A drop in PCV usually observed over the next several days.

Increased RBCs in abdominal fluid if hemorrhage into the abdomen or the broad ligament

Behandling

Minimize stressful procedures - manipulation of the uterus could dislodge or break down a clot and therefore, result in fresh hemorrhage

Keep the mare in a quiet stall and wait for spontaneous clotting

Analgesics & Anti-inflammatory drugs (e.g., flunixin meglumine),

Avoid Acepromazine

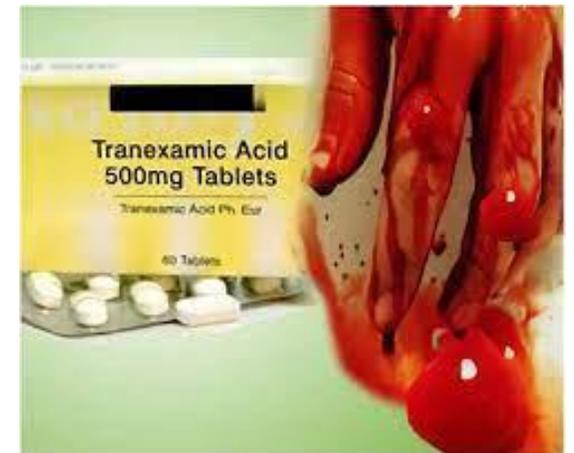
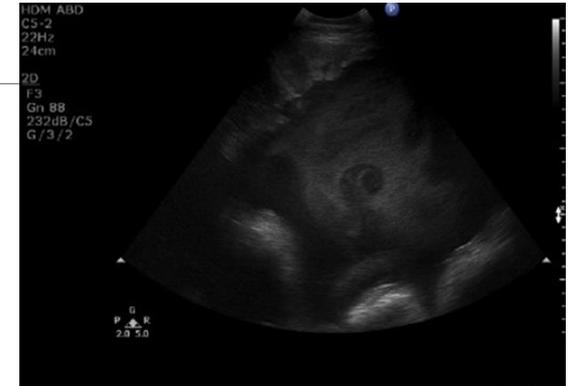
Antifibrinolytic drugs – tranexamic acid may assist with clot stabilisation

Volume replacement fluid therapy, in more desperate situations administer blood transfusions / hypertonic saline

Laparotomy to ligate the bleeding vessel , Anesthesia and subsequent surgery present significant risk

When condition is stable, mare should rest in the stable 2-4 weeks (for clot to stabilize)

Sudden death may occur even weeks after the initial bleed (rupture of hematoma)



Prognosis

Depends on the severity of the hemorrhage.

Broad ligament associated with a better prognosis for survival (limited volume results in pressure that permits clotting and limits bleeding)

However, ligament may lacerate, resulting in massive, acute hemorrhage into the abdomen.

Fertility not affected

Greater risk for additional hemorrhages in subsequent parturitions

Bleeds often become more severe each year. Owners should be made aware of this risk before breeding the mare again.

Secondary to dystocia – straining; trauma from the foal's extremities

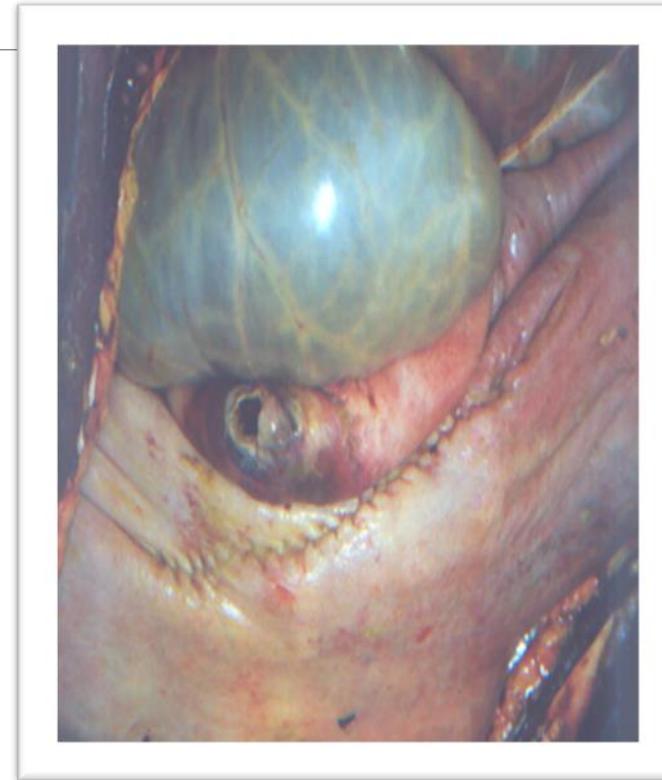
Iatrogenically by overly aggressive manipulation of a fetus or during a fetotomy

Less frequently during normal delivery

Acute stage – can be without obvious signs, later (24-48 h) peritonitis develops

Uterus highly toned on per rectum examination

Mare's reproductive tract should be examined immediately post-partum, particularly after a dystocia, to identify a laceration early before secondary complications develop



Usually occur in uterine body, ventrally or dorsally, but also reported in the horns (right more often)

Lacerations in the uterine body often palpable per vagina

Even partial-thickness lacerations can lead to bacterial contamination and subsequent inflammation that may transfer into the abdominal cavity.

If the laceration is large, other abdominal organs (e.g., intestine and bladder) may be present in the uterine lumen or palpable through the tear

Endometrial folds very pronounced immediately post-partum so it can be difficult to identify smaller or partial-thickness lacerations

Transmural palpation of the uterine wall should also be performed if a laceration is suspected; with sterile arm in the uterus and the other arm in the rectum. The dorsal uterine wall is trapped between the examiner's hands. By applying gentle pressure and slowly "walking" across the dorsal surface of the uterus, it becomes easier to identify small full-thickness and partial-thickness lacerations.

Treatment

Conservative medical / surgical through exploratory laparotomy

Based on clinical signs, size of the laceration, potential for abdominal contamination

Small lacerations can close very quickly (few days)

Broad-spectrum systemic antimicrobials and anti-inflammatory drugs

Fluid therapy and abdominal lavage often are indicated.

Prognosis

Variable, depends on the degree of abdominal contamination

For 49 mares, survival was 75%, with no significant difference between medical or surgical treatment (Javscas, 2010 *Vet surgery*)

Better outcome associated with early identification and treatment

The uterus typically heals well and the laceration can no longer be identified

Most recovered mares - normal fertility and no increased risk of problems in subsequent foalings

In rare cases, 2ndary to peritonitis – abdominal and uterine adhesions that can prevent normal uterine clearance and therefore, cause problems with fertility

1) Cecal impactions / rupture

Late gestation associated with motility disturbances – may lead to gas and ingesta build-up

Hospitalisation – increased risk

Predisposes to rupture due to increased abdominal pressure during parturition

67% mares ruptured at ileocecal junction

Peritonitis, signs of endotoxic shock, CVS collapse

Diagnosis: abdominocentesis, rectal examination – pneumoperitoneum and gritty serosal surfaces, exploratory celiotomy

2) Large colon volvulus

Last months of pregnancy and up to 120 days after foaling (brood mares 13 times more likely than geldings or stallions)

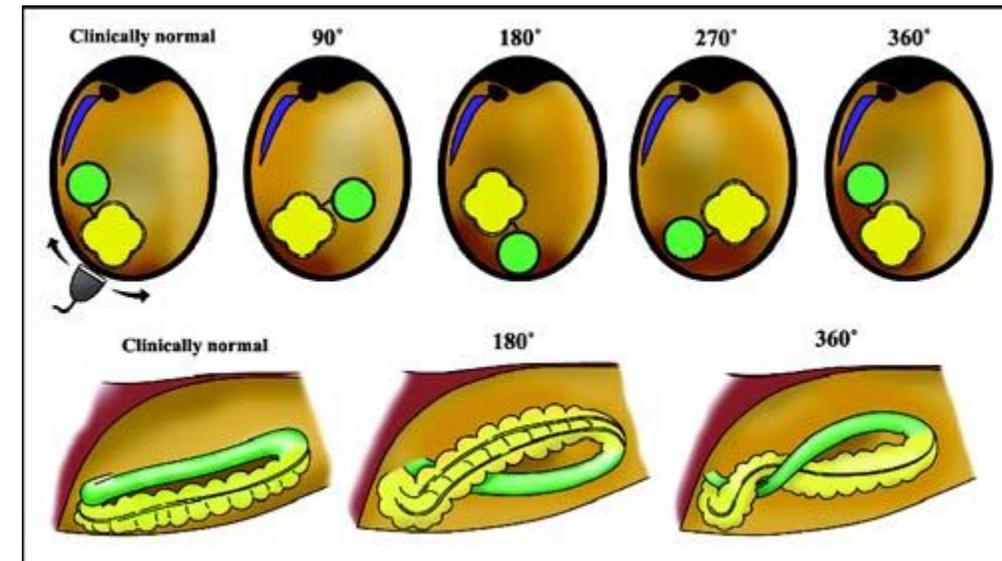
Majority of cases need surgical resolution – rapid referral key

Severe pain, unresponsive to analgesia, marked abdominal distention

CVS deterioration

Prognosis guarded to favourable

These mares are at risk of secondary complications including repeat volvulus, chronic colic, secondary infections and laminitis



Thanks for attention