Proceedings of the 10th International Congress of World Equine Veterinary Association

Jan. 28 – Feb. 1, 2008 - Moscow, Russia

Next Congress:

WEVA 2009 Congress
Guanujá-SP, Brazil, September 24-27, 2009

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PERINEAL AND CERVICAL ABNORMALITIES

Jonathan Pycock & Sidney Ricketts

Equine Reproduction Services, Messenger Farm, Ryton, Yorkshire

Rossdale & Partners, Beaufort Cottage Stables, Newmarket

**Perineal Abnormalities**

**The perineum is the area that includes the anus, vulva, and the adjacent skin.**

**Vulva**

In the normal mare the vulva provides the first effective barrier to protect the uterus from ascending infection. The 'normal' mare has three functional genital seals forming a barrier between the external environment and the uterine lumen: the vulva, the and the cervix. During oestrus, the vulva and cervix relax, leaving the vulvo-vaginal constriction as the only seal.

The vulval lips should be full and firm and meet evenly in the midline with 80% or more of the vulval opening is below the brim of the pelvis. If the vulval seal is high (more than 4 cm of length dorsal to the pelvic floor) in relation to the pelvic brim, the vestibular seal is incompetent and aspiration of air (pneumovagina) and the aspiration of bacteria and contaminated material into the vagina can occur. The initial vaginitis may lead to cervicitis and acute endometritis resulting in subfertility. Contamination of the caudal reproductive tract with bacteria during pregnancy can result in embryonic death, and in late pregnancy can result in the development of placentitis and lead to abortion. Furthermore, the pneumovagina may lead to a urovagina (urine pooling within the vagina) when the vestibule and urethral opening are displaced cranially. The more severe conformational abnormalities are more likely to result in failure of the vulval seal, and to increased faecal contamination since the vulva forms a shelf on to which faeces may collect. The vulval lips may be angled at 25 or even 50 degrees to the vertical in these cases.

Caslick (1937) first pointed out the importance of this condition in relation to genital infection in Thoroughbred mares. Interestingly, it is most commonly found in Thoroughbreds, and, in the author's experience, is almost unknown in Shires and native ponies.

Defective vulval conformation can be (1) congenital, which is very rare or (2) acquired, which is due to (a) vulval stretching following repeated foalings, (b) injury to perineal tissue or (c) poor bodily condition (old, thin mares).

Older, pluriparous mares are more commonly affected with pneumovagina (aspiration of air into the vagina). However, young mares that are in work and have little body fat and/or poor vulval conformation, can also develop pneumovagina. In some mares, pneumovagina may only occur during oestrus when the perineal tissues are more relaxed. Some mares make an obvious noise whilst walking, but in other mares the diagnosis may be more difficult. The presence of hyperemia and a frothy exudate in the anterior vagina on examination with a speculum is pathognomic. Rectal palpation of a ballooned vagina or uterus from which air can be expelled confirms the diagnosis. Real-time ultrasound examination of the uterus may reveal the presence of air as hyperechoic (white) foci sometimes seen as a line at the opposed lumenal surfaces. Cytological and histological examination of the endometrium may demonstrate significant numbers of neutrophils indicative of an endometritis. Rarely eosinophils are also found in association with vaginal windsucking. Pascoe (1979) describes a Caslick Index (slope of vulva x length of vulva) which assists determination of the need for corrective surgery. This Index is particularly useful in mares not showing classical signs of pneumovagina.
Fig. 1
Lateral view of the normal anatomical relationships between the posterior genitalia and the ischium, showing three functional seals between the uterus and the external environment. Above, dioestrus: cervix closed, vulval and vestibular seals effective. Below, oestrus: cervix and vulva relaxed, vestibular seal effective until penetrated by natural mating.

From Rossdale & Ricketts (1980)

Fig. 2
As in Fig. 1 but in a mare with poor conformation, in dioestrus. a, ischium low in relation to vagina, so vestibular seal is ineffective, but in this case the vulva is competent so that the cervix is not challenged. B, as for A, but with incompetent vulva, so that pneumovagina occurs and the cervix is directly challenged by environmental micro-organisms. C, as in B, further aggravated by sloping vulva which allows faecal contamination of the vestibule.

From Rossdale & Ricketts (1980)
A lateral view of the anatomical relationships between the anus, vulva and ischium. (a) good conformation. (b) poor conformation, predisposing to (c) in which the labia are in the horizontal plane.

From: Rossdale & Ricketts (1980)

Caslick's Vulvoplasty Operation

Treatment should be directed at correcting the cause of pneumovagina and concurrently treating the resulting acute endometritis. The former can be done surgically by Caslick's operation although in some cases increasing the physical condition and fat status of the mare may be sufficient. This is the most common surgical procedure performed in studfarm practice, but in the author's opinion some mares are subjected to Caslick's operation unnecessarily. The operation should be reserved for mares with a true vulval defect rather than just because the mare has failed to become pregnant.

The mare should be suitably restrained and her vulva thoroughly cleaned and dried. With a gloved hand, the level of the floor of the pelvis is determined. This allows you to ascertain the level to which the dorsal commissure of the vulva must be sutured. Beginning at this level, the mucocutaneous junction of the vulva is infiltrated with local anaesthetic through a 21 gauge one inch needle. It is important to use plenty of local anaesthetic and in many cases at least 20 ml will be needed. The local helps to every the mucocutaneous junction. Both sides of the vulva are infiltrated in a stepwise fashion proceeding dorsally up to the dorsal commissure being sure that enough local is put right at the dorsal extent of the vulva. For mares operated on previously it is important to infiltrate deeply. Using rat-toothed forceps and scissors a VERY THIN (no more than 4 mm) strip of mucosa from the anaesthetized area. For older mares that have had the operation performed several times, more radical dissection may be necessary before healthy (bleeding) tissue is reached. In some cases, where there is not much vulval mucosa remaining, it is best to just 'freshen up' the junction with a scalpel bade to get bleeding and not actually remove any further tissue. The exposed submucosal tissues are sutured together using simple interrupted sutures (mares which have had the operation performed before) or a locking pattern. The suture material may be permanent or absorbable. The gauge of the suture material should not be too thick as this encourages faecal material to attach to the sutures. Skin staplers can be used, but the author found no time advantage over conventional suture techniques and it was harder to obtain a good alignment. Antibiotics are not given, but tetanus prophylaxis is needed if the mare is not vaccinated.

The aim of the operation is to reduce the vulval aperture and so prevent pneumovagina and faecal contamination of the vestibule. The time of suture removal is not crucial and is normally done approximately two weeks after surgery. However, the vulva must be re-opened by performing an episiotomy before the next foaling otherwise major damage can result. Mares that require natural mating subsequently may also need to have an episiotomy performed if 'tightly stitched'. If not the vulva may rip and/or injury to the stallion's penis may occur. The episiotomy wound should be repaired soon after foaling or mating to prevent pneumovagina. If there has been severe
trauma to the vulva at foaling, it may be necessary to wait for the tissue swelling to subside before attempting repair.

If repeated episiotomy followed by closure is not done very carefully, there can be considerable loss of vulval tissue, poor healing and major problems for the mare.

When the angle of the vulval surface relative to the vertical is the primary defect, Caslick’s operation is often ineffective, and perineal resection should be used to achieve a satisfactory vulval conformation (Pouret, 1982). Caslick’s operation has no effect on urovagina.


Pouret’s Perineal Reconstruction Operation

In an attempt to overcome unwelcome Caslick’s sequelae, Pouret described an alternative operation that does not reduce the size of the vulval aperture and corrects both pneumovagina and some cases of urovagina. Pouret suggests that as mares become older, their abdominal muscles slacken and the intestinal tract displaces cranio-ventrally. This results in cranial displacement of the rectum and anus, which, because of their intimate relationships with the caudal vagina and vulva, results in cranial displacement of the upper commissure of the vulva. Surgical sectioning of these muscular and ligamentous connections allows the rectum and anus to displace cranially, independent of the vagina and vulva, which return caudally to their normal position, producing a more vertical vulva. The vestibule, including the urethral opening, moves caudally, allowing improved voiding of urine.

The mare is prepared for 7 days prior to surgery with a laxative diet, to soften but not liquefy her faeces. She should be restrained bridled in stocks and tranquillised with 8 mg/kg detomidine hydrochloride (“Domosedan”, Smith Kline Animal Health Ltd.) and 1 mg/kg butorphanol (“Torbugesic”, C-Vet Ltd.), for their combined sedative and analgesic effects. Tetanus vaccination status is supplemented as necessary. Prophylactic oral antibacterial medication is started before surgery, with a combination of trimethoprim sulphonamide and metronidazole (“Metronex pastes”, Cheminex Ltd). Using standard techniques, epidural analgesia is induced. To avoid residual sensitivity from incomplete epidural block, local infiltration analgesia of the recto-vestibular shelf is recommended. Approximately 20 ml 2% lignocaine hydrochloride, with adrenaline, is injected under the vulvo-anal skin and cranially and laterally into the shelf. The adrenaline provides a useful haemostatic function. The bandaged tail is held to the side, faeces are removed from the rectum and the perineum is thoroughly cleansed and scrubbed for surgery.

A 4-5 cm horizontal skin incision is made half-way between the anus and the vulva. The subcutaneous tissues are separated with scissors and the upper skin margin is elevated, by an assistant, with Aliss’ tissue forceps. Straight Mayo scissors are used and the points are deliberately pointed slightly downwards to avoid accidental rectal perforation; sharp and blunt dissection is made cranially and laterally to split the rectovaginal shelf. For a right-handed surgeon, it is helpful to place the left hand into the vagina to aid orientation. At approximately 10 cm cranial to the perineal skin, muscular tissue disappears at the dissection site, signifying the level of the peritoneal reflection. Any residual muscular tissue that can be palpated laterally to the line of dissection is then sectioned. During the dissection, the cranial displacement of the anus and the caudal return of the vulva becomes progressively apparent and a horizontal perineal shelf develops. No attempts are made to close the subcutaneous ‘dead space’ but the skin must be very carefully closed with close interrupted 00-gauge monofilament nylon sutures to obtain primary intention healing. A ‘T’-shaped closure makes maximal use of the horizontal perineal shelf.
Fig 4
Diagram of the lateral view of the pelvic organs of a mare with a sloping vulva. a. Vulval suspensory ligament; b. anal retractor muscle; c. anal sphincter muscle; d. vulval constrictor muscle; e. caudal vulval constrictor muscle; f. plane of surgical dissection.

From Ricketts (1987)

Fig 5
Diagram of lateral view of the pelvic organs of a mare following surgery, showing the horizontal ano-vulval shelf (a) that has been created.

From Ricketts (1987)

Post-surgical swelling is minimised with 1 g phenylbutazone, given iv at the end of the surgical procedure. Oral antibacterial medication is maintained for 5 days and the skin closure is carefully cleansed daily, until sutures are removed, progressively, starting at 10 days post-operatively. Walking exercise is given from day 1 and natural mating is not allowed for 3 weeks.

Pouret reported 19 surgical cases and reported no serious untoward sequelae. To date Sidney Ricketts has operated on approximately 100 mares, two of which suffered post-surgical
rectal necrosis and formed rectovaginal fistulae, probably associated with dissection close to the rectal mucosa and insufficient pre-surgical softening of the faeces. Three have formed post-surgical perineal seromas, wound breakdown and secondary infection, which subsequently healed by second intention.

The procedure produces improved perineal conformation and is recommended for mares who will or have not responded adequately to simple Caslick’s vulvoplasty. Improvements in perineal conformation are achieved in all cases but as most are older subfertile mares with multiple gynaecological structure and function abnormalities, the assessment of success in terms of improved fertility is difficult.

**Fig 6**

Diagram of rear view of the perineum of a mare following surgery, showing the T-shaped skin closure (a) which helps to maximise and maintain the horizontal shelf.

From Ricketts (1987)

**Vulvo-vaginal constriction**

Immediately in front of the external urethral opening is the vulvo-vaginal constriction or vestibular seal. In genitally healthy mares this forms the second line of defense against aspirated air and faecal material.

**Hymen**

Manual vaginal examination of maiden mares often reveals the presence of hymen tissue which generally breaks down with pressure. A complete persistent hymen can also occur which can result in the accumulation of fluid within the vagina and uterus due to impaired natural drainage. Sometimes the hymen may be so tough that it can only be ruptured using a guarded scalpel blade or scissors. The small incision can then be enlarged using the fingers and hand. Rarely, failure of proper fusion of the Mullerian ducts may result in the presence of dorsoventral bands of fibrous tissue in the anterior vagina and fornix. They do not interfere with fertility and are easily broken down manually.

**Vagina**

**Vesicovaginal reflux**

Also known as urovagina or urine pooling, is the retention of incompletely voided urine in the cranial vagina due to an exaggerated downward cranial slope of the reproductive tract. Pneumovagina from a defective vulval conformation also predisposes to the condition. Transient urine pooling, which is sometimes found in postpartum mares, usually resolves after uterine
involution has occurred. Clinical signs can include urine dripping from the vulva, urine scalding and a history of failure to conceive. Diagnosis is easiest using a speculum examination during estrus to detect urine in the cranial vagina. Uterine infection with an accumulation of exudate in the vagina can be confused with the condition. In severe cases, urine pooling should be surgically corrected.

**Vaginal bleeding**

From varicose veins in the remnants of the hymen at the dorsal vestibulovaginal junction is occasionally seen in older mares, particularly during estrus and the second half of pregnancy. Although diathermy can be used, treatment is not usually necessary as the varicose veins normally shrink spontaneously.

**Third-degree perineal lacerations and recto-vaginal fistulas**

No attempt will be made to describe the surgery for this condition as it is beyond the scope of this paper. However, it is important to be familiar with the procedure to be followed when this is encountered as a sequel to foaling. Both the conditions are most often seen in young, primiparous mares, although the overall occurrence is less than 0.1% of all foalings. The rigidity of the birth canal, especially the vulvo-vaginal junction plays an important role in the cause of the trauma.

In most cases, the veterinarian becomes involved only after the foal is born and the damage already exists. For treatment in the acute situation, you should realise that it is difficult to estimate the amount of de-vitalised tissue. Even though the edges of the wound may look fresh and clean, much more tissue is damaged and bruised. This is why immediate repair is not performed, unless you are present within two hours of the injury and even then, most clinicians advise delaying surgery.

First aid treatment should include:
- debride non-viable tissue
- provide haemostasis and generally clean the area
- parenteral broad-spectrum antibiotics for five days
- NSAIDs & tetanus prophylaxis
- daily cleaning
- monitoring of uterine involution.

Elective surgery is performed after at least 10 weeks. If the foal survived, the operation is best performed after weaning.


**Cervix**

The cervix forms the important third (and last) protective physical barrier to protect the uterus from the external environment. The cervix must also relax during oestrus to allow intrauterine ejaculation or insemination of semen and drainage of uterine fluid. An inflammation of the cervix is usually associated with endometritis and/or vaginitis.

Anatomically, the cervix is a thick walled sphincter. Expansion and contraction are possible due to the action of the longitudinal and circular smooth muscle which are rich in elastic fibres. A distinctive feature of the equine cervix is the dilatability of lumen and the lack of rigid, annular constricting rings seen in farm animals. This means that the uterine body can be entered by a relatively large diameter instrument. The cervix is a dynamic organ which changes its size, consistency and shape according to hormonal changes during the oestrous cycle. During anoestrus the cervix is flaccid, dry and may be partially open. During dioestrus and pregnancy, elevated concentrations of plasma progesterone cause the cervical os to close, although its lumen can still be entered. The cervix is pale, tonic and dry and projects into the cranial vagina. The cervix during oestrus is usually moist and sometimes hyperaemic. The cervical os is usually open oedematous and rests upon the ventral floor of the cranial vagina.

**The old maiden mare syndrome**

Often an older maiden mare has an abnormally tight cervix due to fibrosis. The cervix fails to relax properly during estrus so that fluid is unable to drain and accumulates in the uterine lumen (Pycock 1993). In many cases this fluid is negative for bacterial growth and presence of
neutrophils. Once the mare is bred the fluid accumulation will be aggravated due to poor lymphatic drainage and impaired myometrial contraction compounded by the tight cervix. The amount of intrauterine fluid will vary in individual mares ranging from a few mls to over a liter in extreme cases. In many cases these mares are susceptible to post-breeding endometritis even though they have never been bred before. To maximise the fertility of these mares it is vital that the veterinarian is aware of the possibility of this type of cervical pathology.

Failure of the cervix to open during oestrus can lead to unwillingness of the stallion to complete mating or intra-vaginal ejaculation. Artificial insemination has been used successfully in mares with an abnormally narrow cervix. Impaired cervical drainage of uterine fluid can predispose to persistent endometritis. Mares with a fibrosed cervix which become pregnant do not normally have any difficulties at foaling. (Estrada and Samper 2006).

Failure of the cervix to close during dioestrus can lead to persistent endometritis and failure to conceive or early embryonic death. Failure to maintain closure during pregnancy can lead to gestational failure. Both surgery and exogenous progesterone have been tried in an attempt to encourage closure of the cervix.

Assessment of the cervix must form a part of the routine pre-breeding assessment of a mare. The cervix can be examined by either direct visualisation using a speculum per vagina and/or by digital exploration. The most information may be obtained by using both methods together to avoid abnormalities going undetected, but in many cases digital palpation is required to properly evaluate the cervix. The cervix is most accurately assessed during dioestrus, when the cervix is closed under the influence of elevated progesterone values.

Damage resulting in cervical incompetence is usually traumatic in origin and most often occurs during parturition. This is especially the case if foetotomy is performed by an inexperienced clinician and without adequate instrumentation. Damage to the cervix can also occur during vigorous mating by an over-sized stallion, especially if the mare was not in full physiological and behaviour oestrus. Usually the damage is not too severe in these cases. The cervix can also be damaged by irritant chemicals such as povidone-iodine.

A recent study reported that older, multiparous mares may be pre-disposed to cervical lacerations (Miller et al 1996). These workers also found that 86% of mares presented for cervical damage repair after a foaling with no reported problems.

Post-breeding repair of cervical lacerations has been documented (Foss et al 1994). Since many cases of cervical lacerations are only detected at the pre-breeding examination or during insemination itself, post-breeding repair so avoiding a 4 to 6 week healing period may be a consideration. The authors conclude that post-breeding repair gave a reasonable chance at pregnancy.

Treatment is specific to the abnormality but the principles are to restore, where possible, normal cervical shape and function:-

**Mucosal defects**

Simple mucosal splits are the most common cervical abnormalities seen in mares. They usually respond to repeated daily digital massage with antibacterial (e.g. sodium fusidate) and hydrocortisone creams, to combat infection and to prevent adhesion formation/reformation, until the cervical lumen is healed, smooth and adhesion-free.

**Luminal and vagino-cervical adhesions**

The former obstruct the cervical lumen and the latter may distort or even obliterate the external os. Unless they can be corrected, both usually lead to infertility. The palpable adhesions should be broken-down by careful digital manipulation, followed by repeated daily digital massage with antibacterial (e.g. sodium fusidate) and hydrocortisone creams, to combat infection and to prevent reformation, until the cervical lumen is healed, smooth and adhesion-free. In cases where the loss of cervical tissue integrity and the extent of the adhesions is insurmountable, the mare should be retired.

**Lacerations**

Simple mucosal splits, if they are diagnosed early, are often relatively simply treated, as discussed above. Full-thickness lacerations are always difficult to repair surgically and the prognosis for successful live foal pregnancies thereafter is always poor. Where there has been
major loss of cervical tissue, surgical repair is best not attempted. Where the laceration is uncomplicated, it is best left for 4-6 weeks to heal and epithelialise before repair is attempted.

The mare is prepared for 7 days prior to surgery with a laxative diet, to soften but not liquefy her faeces. She should be restrained bridled in stocks and tranquillised with 8 mg/kg detomidine hydrochloride (“Domosedan”, Smith Kline Animal Health Ltd.) and 1 mg/kg butorphanol (“Torbugesic”, C-Vet Ltd.), for their combined sedative and analgesic effects. Tetanus vaccination status is supplemented as necessary. Prophylactic oral antibacterial medication is started before surgery, with a combination of trimethoprim sulphonamide and metronidazole (“Metronex paste”, Cheminex Ltd).

The rectum is emptied and the tail head, perineum and buttocks are clipped and prepared for surgery. Epidural analgesia is administered, an episiotomy is performed for mares who have sutured vulvas, the vulval labia are stay sutured wide open and wide-blade retractors (or an improvised 15 cm diameter vaginal speculum - see below) are used to give as much exposure as possible, the lack of which is the major problem with this operation. The cervix is then retracted, as far caudally as is possible, using either Knowles uterine forceps or long retention sutures placed at the caudal-most aspects of the defect. Long (30 cm) tissue forceps, scissors, scalpel handle and needle holders are required. The edges of the defect are then incised and the three layers (vaginal mucosa, fibro-muscularis and cervical mucosa) exposed, making sure to dissect far enough cranially. Each layer is then sutured along its length, cranially to caudally, using absorbable suture material, starting with the cervical mucosa, then the fibro-muscularis and then finishing with the vaginal mucosa. The cervical lumen should be frequently checked for patency during the surgery. Post-operative phenylbutazone treatment is administered.

Fortunately, the majority of cervical lacerations occur dorsally, for which the standing position provides the best access. For ventral lacerations and for mares who are not temperamentally suited to allow the procedure to be performed in stocks, general anaesthesia, with the mare in lateral or dorsal recumbency, is required. Even with the hindquarters elevated, intra-abdominal pressure makes vaginal access difficult. For such cases we have used an improvised 15 cm diameter vaginal speculum, made out of a plastic drainpipe, into which the cervix may be retracted and operated upon.

Success rates for cervical laceration surgery vary, depending on the experience and skill of the surgeon, as well as the fertility potential of the mare. The latter should always be considered before recommending cervical laceration surgery. The overall success rate of 50-60% claimed by most surgeons experienced in this technique is much reduced for individual aged mares with advanced chronic endometrial disease. Many cases re-lacerate at subsequent parturitions and will require repeated repair.


Incompetence

Incompetence to close most commonly follows injury at foaling or at mating, where the fibro-muscularis separates or stretches, without damage to the mucosa. In cases where the defect is discrete and obvious, repair may be attempted by surgically converting the damage into a laceration and then performing a repair as described above.

Retention sutures have been described for use in cases of cervical incompetence. An encircling, non-absorbable Mersilene suture is placed sub-mucosally during the first two days after mating and ovulation. The suture must be removed before foaling, or irreparable damage will result. Similarly, the suture must be removed before abortion. Such mares are “high risk” for abortion, the timing of which cannot be predicted, and thus I believe that this technique is unacceptable, on humane grounds.

In some pony mares, a condition leading to some degree of cervical incompetence to open appears to occur. In these cases, the cervix never seems to relax to the extent normally expected, in spite of normal oestrous behaviour throughout the breeding season. Conception failure may occur because the stallion is unable to ejaculate sufficient quantities of semen into the uterus. Treatment has been attempted by injection of oestrogens, with apparently variable success.
FURTHER READING


Case Reports

A 10 year old multiparous Thoroughbred mare had been 'caslicked' the previous breeding season, foaled unexpectedly and unattended. The mare has expelled the placenta, the foal is normal and sucking well. The mare had a serious 2nd degree perineal laceration when examined 12 hours after parturition.

i) When would you repair this?

ii) How would you repair this tear?

Answers

i) Where bruising is minimal, a full repair can be carried out immediately to prevent pneumovagina. Where bruising is more extensive, a temporary repair should be carried out to minimize uterine infection and pneumovagina. The mare had been caslicked, so pneumovagina
and infertility would have been a factor in her previous history and therefore considered as a risk to
the mare's future fertility status if not repaired in some manner as soon as possible.

ii) A careful examination of the area should be made to assess:
   a) no cervical damage has occurred
   b) the rectal mucosa is intact
   c) whether the extent, amount of bruising, future contamination and/or infection may
delay primary healing if a repair is effected.

Should bruising be too extensive, then repair should be delayed for 7-10 days, or if the
degree of injury is severe, the wound may need to granulate before repair. This is governed by the
degree of angulation of the vulva and pneumovagina which may develop in the interim, in which
case, the repair should be effected even though the eventual outcome may need a second repair.
This should be made clear to the owner/stud manager.

If assessment indicates a poor immediate surgical risk, surgery should be postponed for 7-
to 10 days. However the external view as shown would indicate the likelihood that there is minimal
trauma and an immediate repair could be contemplated.

**Repair procedure**

a) Tranquillize mare after placing in stalls, preferably, or over stable door, or several bales of
hay (less satisfactory);

b) Where 2nd degree tear is extensive, an epidural can be considered using OR local
infiltration to full depth of the tear can be used.

c) Thoroughly clean surgical area and surgically prep with Povidone-iodine. Surgically
debride all severely bruised tissues, tag ends which will be non-viable; tie off any new points of
haemorrhage. Wherever possible, freshen tissues slightly to ensure all bruised tissues are
removed before suturing.

d) Repair can be made using single deep vertical mattress sutures of synthetic
monofilament suture material such as polypropylene (Proline, Ethicon), Surgelene (Davis & Geck),
absorbable polymer sutures such as Polyglycolic acid (Dexon, Davis & Geck), polyglactin 910
(Vicryl, Ethicon) or polydioxanone (PDS, Ethicon) can be used. These sutures should be placed to
close the injured area, bring the vaginal mucosa back into apposition and close the dead space
between the vagina and skin tear. A continuous lock stitch can then be used as a skin suture; if
there is a risk of dehiscence then single interrupted skin sutures would be preferable.

**CASE TWO (Taken from: Pycock, J.F. (1997) Self-Assessment Colour Review of**

A 3 year old Warmblood mare has foaled her first foal and due to a head and leg
displacement, has been presented to you 30 minutes after parturition with a severe 3rd degree
perineal laceration.

i) What information would your preliminary assessment provide?

ii) When can this type of injury be repaired?

iii) Name 2 common surgical techniques used in this repair; explain how they differ?

iv) What are the mare's fertility expectations following surgery?

v) What are the possible complications for future breeding and foaling?

**Answers**

i) Assessment of heart rate and mucous membrane colour - increasing rate and blanching of
mucous membrane indicate possible internal haemorrhage. Careful palpation of anterior vagina
and rectum - possible tear into abdominal cavity or peri-rectal space. Assess depth, site location of
tear and extend of severe deep tissue injury. Eliminate injury to other pelvic organs if possible:
uterine haemorrhage; middle uterine artery tear; prolapsed bladder; injury to small or large colon
by foal's hind legs.

ii) Where foaling and injury has occurred less than two hours before examination, immediate
repair can be investigated, but is rarely indicated. Usually severe bruising and laceration are
present, and repair should be delayed until granulation of the area occurs in 8 -10 weeks.

iii) a) The Aanes technique is a two stage repair:

   **Stage I** reconstructs recto vestibular shelf but leaves perineal body open

   **Stage II** perineal body is closed 3-4 weeks later.
b) The Goetze technique is a single stage operation - two flaps are created on each side to relieve tension when the flap ends are drawn into apposition; single 6 bite sutures are placed and tied in the vaginal canal. The principle is to evert the rectal mucosa into the rectum and vaginal mucosa into the vagina with a form of purse string suture.

iv) Fertility should be good in young mares where an effective repair has occurred with good return of conformation of rectum and vulva; may be some reduction in older mares, particularly if a lower fertility was present prior to surgery.

v) a) Repair has over closed vaginal canal; mare may not be capable of natural service and may require AI. Examination at the end of pregnancy may indicate the need for c/s to prevent a repeat tear.

b) Future foaling may incur a similar tear to happen but experience indicates this is less than a 3% possibility.

c) Uterine infection from the original injury must be resolved and is usually not a problem in young mares as most conceive within 3-4 months of surgery. Old mares may require 10-12 months to regain normal fertility. This is in part related to length of period the uterus remains contaminated after injury.