Vaginal prolapse – why does it happen and how best to treat?

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Introduction
Vaginal prolapse in the bitch is most commonly caused by excessive hyperplasia of vaginal tissue in entire females under the influence of oestrogen during pro-oestrus and oestrus, and occasionally prior to whelping. Vaginal prolapse caused by other aetiologies, such as post partum or vaginal trauma, is rare in bitches. Therefore, the following discussion is only about vaginal prolapse secondary to hyperplasia.

Vaginal prolapse occurs when there are high plasma concentrations of oestrogen. However, the concentrations of oestrogen measured in a limited number of clinical cases have been within the normal range for that stage of the reproductive cycle. Therefore, the aetiology of vaginal prolapse due to hyperplasia is unknown. Possible causes could be an exaggerated proliferation of tissue to normal concentrations of oestrogen or an increase in another factor which is synergistic with oestrogen, however further research is required.

The hyperplasia originates from the urethral tubercle which is a protrusion of the ventral vagina cranial to the urethra. This forms part of the vestibular-vaginal sphincter and is sometimes called the cingulum. The urethral tubercle normally increases in size during pro-oestrus and oestrus. The vaginal prolapse occurs when the enlargement of this tissue is excessive. The hyperplasia of the urethral tubercle is generally most severe in late pro-oestrus when oestrogen concentrations peak.

The main differential diagnosis of vaginal prolapse due to hyperplasia of vaginal tissue is eversion of a vaginal tumour, which is more likely during dioestrus and anoestrus.

Diagnosis
The diagnosis is made by physical examination of the bitch and observation of vaginal hyperplasia. Three grades of vaginal hyperplasia are often used to describe the severity of the prolapse. Grade 1 vaginal hyperplasia occurs prior to prolapse with slight to moderate eversion of the vaginal wall and no protrusion through the vulva. Swelling of the perineum may be seen. Grade 2 is protrusion of the urethral tubercle through the vulva. Grade 3 vaginal prolapse is when 360 degrees of vaginal tissue protrudes through the vulva and is uncommon.

Vaginal cytology is a useful test to differentiate vaginal prolapse in non-pregnant bitches from vaginal tumours as the vaginal cells will be mostly cornified if the bitch is in pro-oestrus or oestrus. If the bitch is in pro-oestrus or oestrus, a tumour is unlikely at these stages of the reproductive cycle.

The plasmatic progesterone concentration should also be measured to determine the stage of the reproductive cycle. The stage of the reproductive cycle assists diagnosis and the management of the condition. If the plasmatic progesterone concentration is <6.4 nmol/L and the vaginal cells are mostly cornified, the bitch is in pro-oestrus. If the plasmatic progesterone concentration is ≥ 6.4 nmol/L and the vaginal cells are mostly cornified, the luteinising hormone (LH) surge has occurred and the bitch is in oestrus. If the plasmatic progesterone concentration is ≥ 6.4 nmol/L and the vaginal cells are mostly not cornified, the bitch is in dioestrus. During early dioestrus, when vaginal prolapse
due to hyperplasia is most commonly seen, the plasmatic progesterone concentration is usually high (>60 nmol/L).

**Treatment**
The treatment of vaginal prolapse depends on the severity of the prolapse and the stage of the reproductive cycle.

**Prolapse of vaginal tissue**
Attention is required to prevent damage to the tissue of the prolapsed vagina. Medical management can be used in mild cases. Barrier creams such as petroleum jelly can be applied to the prolapsed tissue to prevent further tissue damage due to desiccation, and an Elizabethan collar applied to prevent self-trauma.

Horizontal mattress or purse string sutures can be employed to hold the prolapsed tissue and to prevent tissue damage after manual reduction of the prolapse. A hypertonic solution, such as sugar or salt solution, can be used to reduce tissue oedema and assist with reduction.

In severe cases, such as Grade 3 prolapse, surgery may be necessary to remove the prolapsed tissue. An episiotomy is necessary to allow adequate exposure. When performing vaginal resection, care should be taken to avoid damage to the urethra. Careful identification of the urethra is required and a urethral catheter should be placed. The bladder can also be present within the prolapsed tissue in severe cases. It should be remembered that the area is highly vascular during pro-oestrus and oestrus so considerable bleeding can be encountered. Some techniques employ the use of a tourniquet-like method to limit the bleeding.

**Oestrogen stimulation**
Oestrogen stimulation can be removed immediately with the use of ovariectomy. Ovariectomy should be considered in all bitches that are not intended for breeding to treat and/or prevent reoccurrence of the vaginal prolapse. If the ovariectomy is performed immediately, the surgeon should have good technical ability as more bleeding can be encountered if ovariectomy is performed during pro-oestrus, oestrus and early dioestrus. There are currently no effective medical treatments available to reduce oestrogen concentrations.

**Decision making**
Artificial insemination may be necessary if the bitch is intended for breeding due to obstruction of the vagina by the hyperplasia. The heritability of the condition is unclear with some authors suggesting there is an increased occurrence in particular families of dogs. However, the incidence of vaginal prolapse often appears to be sporadic.

The vaginal hyperplasia would be expected to start to reduce in size after the LH surge. Therefore, if the prolapse was not severe and the bitch was in oestrus, it could be expected that the prolapse would improve with time and the bitch could be managed medically.

Suturing of the vulva could also be considered if the bitch is in oestrus after the LH surge as the prolapse would not be expected to worsen. Any bitch which has the vulva sutured in pro-oestrus must be monitored carefully as the hyperplasia would be expected to increase in size. The increase in size of the hyperplasia would be likely to result in the release of the sutures and the bitch could become uncomfortable.

Mild and moderate vaginal prolapses may be treated medically and given time to resolve spontaneously. For example, if the prolapsed tissue is viable one could wait until mid-dioestrus to see if the condition will resolve before considering surgery.
**Pregnancy**

Vaginal prolapse that occurs at the end of pregnancy can often be managed medically. If the vagina is not constricted the bitch will often whelp unassisted, otherwise caesarean section may be indicated.

**Prognosis**

There is a risk of reoccurrence of vaginal prolapse associated with hyperplasia and the estimated risk has been reported at 66%. In cases that have undergone surgical resection, it is possible that alteration of the cingulum might create a problem with tying as the cingulum holds the bulb of the penis in place during mating.

**References**


