Proceedings of the Southern European Veterinary Conference and Congreso Nacional AVEPA

Oct. 17-19, 2013 - Barcelona, Spain

Next Conference:

Oct. 16-18, 2014 - Barcelona, Spain

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The perineal hernia occurs due to weakness and separation of the pelvic diaphragm components. The loss of pelvic diaphragm support allows dilatation and deviation of the rectus abdominis muscle and caudal protrusion of some organs (prostate, prostatic cyst tissue, retroperitoneal fat, bladder and intestine) into the perineal area. Herniation occurs in the most cases between the levator ani muscle, internal obturator muscle and external anal sphincter (named caudal perineal hernia). Although it is less common, the hernia can also take place dorsally between coccygeus muscle and levator ani muscle, ventrally between ischiouretral muscle, bulbocavernosus muscle and ischiocavernosus muscle, and also laterally between coccygeus muscle and sacrotuberous ligament (named sciatic perineal hernia).

ETIOLOGY:

83 to 93% of dogs suffering from perineal hernia are entire males. Although it can be seen in any breed, the ones predisposed include Pekinese, Boston Terrier, Boxer, Poodle, Bouvier and English Shepherd.

The exact cause is unknown and it is probable multifactor conditions. Factors suggested in literature include congenital predisposition, rectal abnormalities, hormonal unbalance, increased size of the prostate and structural weakness of the pelvic diaphragm.

- Rectal abnormalities: deviation, sacculation/dilatation and rectal diverticulum. The rectal deviation is a “S” shaped curve within the hernia and rectal sacculation is dilatation of the wall within the hernia. The rectal diverticulum is a tear in the seromuscular layers of the wall through which the mucose dilates within the hernia. The rectal deviation is the most benign among these conditions because it can be corrected by herniorrhaphy, the rectal deviation would be impossible without herniary space where to deviate into. The sacculation and diverticulum have been reported in absence of hernia and they may probably precede it.
- Therefore, collection of feces in the sacculation or diverticulum causes effort to expulse it; continuous tenesmus causes pressure on the pelvic diaphragm, thus enhancing the hernia. Although this is a potential cause, not all dogs with perineal hernia show rectal abnormalities. These anomalies are believed to be consequence of a perineal hernia, not to cause it.
However, a rectal obstruction or the presence of rectal diverticulum may result in excessive effort during defecation.

- **Androgen:** Studies report some evidence suggesting that castration performed at the same time that the perineal hernia reduction may help preventing its recidivation. A study reported that the risk of recidivation was 2.7 fold higher in entire males than in castrated males. Another study suggests that castration reduces the risk of recidivation by 23-43%.

- **Genre associated anatomic differences:** females show larger, wider, stronger levator ani muscle, with longer rectal insertion and larger sacrotuberous ligament.

- **Relaxin:** although its role in the perineal hernia etiology is less understood, higher expression of relaxin receptors has been reported in dogs with perineal hernias than in normal dogs.

- **Prostatic disease:** 25-50% of dogs with perineal hernias have concomitant prostatic disease. The prostatic disease causes chronic effort during defecation being able to predispose to development of perineal hernia. This is why castration is also recommended.

- **Neurogenic atrophy:** it has been identified in coccygeus and levator ani muscles (lesion in muscle branches of pudendal nerve or sacral plexus). In dogs with perineal hernia, high occurrence of spontaneous potentials has been reported according to electromyographic studies of levator ani, external sphincter and coccygeus muscles.

**CLINICAL PRESENTATION:**

Symptoms are due to collection of fecal material in the dilated or deviated rectum, pelvic canal obstruction or incarceration or strangulation of herniated organs. The most common clinical sign is unilateral or bilateral presence of perineal inflammation (48% of cases in a study), tenesmus (15%) and constipation. Stranguria may be observed in patients with prostatic disease or bladder retroflexion.

Perineal hernias may be unilateral (47-66%) or bilateral; 59-84% of unilateral cases affect the right side.

Vesical retroflexion has been reported in 20-29% of cases. This situation requires urgent treatment (bladder drainage by catheter or perineal cystocentesis, assessment of renal parameters and metabolic disorders, fluid therapy and placing of urinary catheter). Once the bladder is empty, the hernia can be reduced manually.

**DIAGNOSTIC:**

The diagnostic is based on symptoms and rectal palpation.

Abdominal radiography is recommended (with cystography if needed), as well as abdominal ultrasonography, given the high number of cases with prostatic disease. Perineal ultrasonography can also be performed to assess herniated organs.

In some cases, other complementary tests may be conducted, such as computed tomography or magnetic resonance imaging in order to help the diagnostic and rule out other conditions.

**DIFFERENTIAL DIAGNOSTIC:**

- Neoplasia
- Prostatic abscess
- Paraprostatic cyst
MEDICAL AND NUTRITIONAL TREATMENT:

The conservative treatment is only recommended for patients which health condition does not allow general anesthesia and surgical procedures.

Includes: fiber rich moist diet, products intended to soften feces (lactulose 0.5-1mL/kg 2 to 3 times a day, methylcellulose, psyllium) and periodic evacuation of feces accumulated in the hernia (manual and by enema).

SURGICAL TREATMENT:

Undoubtedly, surgery is the treatment of choice.

Prior to the surgery, complete examination of the patient must be performed (biochemistry and complete blood cells count, urinalysis).

Enemas are not recommended within the 24-48 hours before the surgical procedure, in order to limit the risk of infections due to liquid feces leak in spite of the anal purse-string suture. Before the surgery, manual emptying of feces collected in the rectal dilatation is recommended.

Many surgical treatments are described to treat this condition:

1. Conventional herniorrhaphy: direct apposition and sutures between levator ani, coccygeus, external sphincter and internal obturator. There use to be quite a lot of tension in sutures; distortion of the anus occurs and the risk of recidivation is high with this technique.

2. Transposition of internal obturator muscle: this is the technique I prefer. The muscle tendon must be sectioned to be able to raise the muscle flap. This technique reduces recidivation, sutures tension and anal distortion.

3. Transposition of the superficial gluteus muscle. This technique allows closing dorso-lateral faults, but it is difficult to close ventral faults. This technique has also been described with simultaneous transposition of the obturator internus muscle.

4. Transposition of semitendinosus muscle: this is a more invasive technique but useful when recidivation has been obtained with other techniques and in case of ventral hernias. When repairing an unilateral hernia by this technique, it is recommended to use the semitendinosus muscle contralateral to the hernia.

5. Polypropylene meshes: although good results have been described with this technique, I choose to avoid this type of synthetic and non-reabsorbable materials in easily contaminated surgical field, which increase the potential risk of rejection and infection.

6. Biomaterials: porcine intestinal submucosa layer (no clinical studies available), porcine dermal collagen (33% with serobloody discharge from the wound and success in just 60%) and autograft of fascia lata. The later has good biomechanical properties and, since it is autogenous material, there is no risk of immunological rejection or reaction to foreign body. It may be used as first choice, simultaneously to other technique in order to support the herniorrhaphy or when observing recidivation with other technique/s. A clinical study did not show recidivations and the most common complication was lameness in the donor limb (although minimal morbidity).

POTENTIAL COMPLICATIONS:
The percent of reported complications varies a lot (15% to 60%). The factors that commonly influence the percent of reported complications include condition seriousness, the technique used, and particularly the surgeon experience.

- Seroma, hemorrhage, anorexia, rectal prolapse, rectal-skin fistula, anal glands fistulization.
- Infection (6% to 45%). Potential causes: excessive dissection of tissues, hemorrhage in the surgical site, strangulation of tissues, penetration of sutures into rectum or anal glands.
- Fecal incontinence: unilateral lesion of pudendal nerve may cause temporal incontinence (re-innervation of anal sphincter occurs from the other side and lasts some weeks). Permanent incontinence (<15% of cases) may occur due to bilateral lesion of pudendal nerves, caudal rectal nerves or external anal sphincter. Incompetence of the anal sphincter may occur due to strengthening of muscles during the procedure or simply due to local inflammation.
- Sciatic nerve lesion (< 5%): may occur when it is trapped in the suture that encompasses the sacrotuberos ligament. This situation requires an urgent new procedure (caudo-lateral approach to hip) to release the responsible suture. The sciatic nerve recovery may take weeks or months.

Some padded tissue or pillow may be placed on the edge of the table under the patient, in order to avoid positional neuropaxia, leaving the hindlimbs hanging untied.

- Urinary dysfunction: bladder atony may occur following bladder retroflexion (18-29% of cases). Bladder atony may cause temporary or permanent urinary incontinence. A study showed a mortality rate of 30% due to bladder retroflexion. Partial dripping incontinence may occur in some cases following vasopexy or deferentopexy when the deferent ducts and the prostate are too withdrawn during the procedure or when fixing the deferent ducts under much fixation.
- Tenesmus (40-50% of cases): it may be due to postoperative inflammation, pain, severe rectal dilatation or tension when performing bilateral repair or suture/s that go through the rectal wall. Continuous tenesmus may cause rectal prolapse, particularly in patients with severe rectal sacculations or mucose edema. The percent of postoperative rectal prolapse is 2 to 13% and occur less commonly when colopexy is performed.
- Recidivation: The percent or reported recidivations ranges from 0 to 70% and depends on many factors: surgeon experience, suture material used, previous repair, tension applied to sutures... The most important factor is the surgeon experience (70% of recidivations when the surgeon is not experienced, 10% with experienced surgeons).

My personal therapeutic choice under the most common clinical scenarios is the following:

- **Simple unilateral hernias (minimum rectal dilatation and absence of abdominal abnormality):** I perform castration and herniorrhaphy using the technique of transposition of the obturator internus muscle. In case in the other side there is muscle weakness of the pelvic diaphragm, I also perform at the same time transposition of the obturator internus muscle contralaterally.
- **Unilateral complicated hernias (recidivations, important rectal dilatation, concomitant prostatic disease, bladder retroflexion) or bilateral hernias:** I perform 2 surgical stages, ideally separated by 2-5 days. Both procedures could be performed one after the other. When one is performed more than one week after the other, the colopexy is less beneficial because it partially relaxes.
  - Abdominal stage: colopexy, cystopexy (in case of bladder retroflexion or prostatic disease) and treatment of the disease (prostatic biopsy, abscess drainage + omentalization...).
  - Perineal stage: Unilateral or bilateral herniorrhaphy using transposition of the obturator internus muscle. When necessary, placation of the rectal wall is also performed.
- In case of recidivation when using this protocol, prosthesis of fascia lata and/or transposition of the semitendinosus should be used.
It is important to perform rectal palpation for verification postoperatively and have the animals on a fiber rich, residues low diet (for life) and products to soften the feces for at least 1-2 months.

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