Surgical removal of a retained fetus and subsequent ovariohysterectomy in a sow

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Abstract

Routine sterilization is no longer a procedure reserved only for companion dogs and cats. With the rise in popularity of household pet pigs and farm animal sanctuaries, spaying gilts and sows is becoming a more common hospital procedure. A 2-year-old crossbred sow presented for an elective ovariectomy procedure. With a history of previous litters and recent estrous cycles, the surgery was expected to proceed as routine. However, during surgery, a firm mass and ulcerative lesion on the uterus were detected. The surgical plan was adjusted and a complete ovariohysterectomy performed. Evaluation of tissues revealed a retained fetus in the right uterine horn. Pain management was implemented for several days after surgery and the patient recovered without complication.

Keywords: Porcine, sow, retained fetus, ovariohysterectomy

Background

Fetal mummification in swine is highest amongst domesticated species, ranging from 1.5 - 6.8%.[1,2] This is likely due to large litter sizes reducing uterine space for adequate fetal growth and development in the final trimester. Fetal mummification is possible after 35 - 40 days of gestation when fetal skeletons have formed. Mummification occurs when a lack of oxygen and a dry environment kill bacteria, halting decomposition of a dead fetus. Over several weeks, the fetus dehydrates and skin develops a characteristic leather-like appearance.

Risk factors for fetal mummification include poor management practices, improper nutrition, environmental factors, mycotoxins, and various infectious diseases, including porcine parvovirus, porcine reproductive and respiratory syndrome virus (PRRSV), porcine enterovirus, and leptospirosis. Litter also has a role; sows and gilts with litters > 12 piglets, have a 14.5 times greater risk of fetal mummification versus those with litters < 10 piglets.[3]

Infectious causes of fetal loss can result in early embryonic death (may be clinically inapparent with a return to estrus), reduced litter size and increased fetal mummies per litter. Typically, females show no outward clinical signs, although anorexia, fever, cyanosis of the ears, and coughing were reported with PRRSV infections.[4] Sows and gilts with fetal mummies may have irregular interestrus intervals or unaltered cycle length, but become repeat breeders.[5]

Diagnosis of fetal mummification is generally established after the sow or gilt has farrowed. Evaluation of fetuses, live, stillborn, and mummified, aid in determining whether physiologic or infectious causes were likely responsible. Typical litter sizes with higher than the average number of mummified fetuses implicate an infectious agent, as compared to a typical litter with no mummified fetus or only a single mummified fetus. Serology, including fluorescent antibody tests and enzyme-linked immunosorbent assay, through paired samples from the dam or taking blood samples from surviving piglets prior to suckling may be helpful. Additional diagnostics may include fluorescent antibody tests and polymerase chain reactions performed on the mummified fetus(es).

Case Presentation

A 2-year-old crossbred pet sow presented to the Lois Bates Acheson Veterinary Hospital's Theriogenology Service for an elective spay (ovariectomy) procedure. She was rescued from a hoarding situation with limited previous history. The patient had farrowed at least 2 litters, with complications during both pregnancies. She experienced rectal and/or vaginal prolapses during late gestation followed by difficult farrowings. The date of her last farrowing was unknown. She had been observed in estrus by her current owner based on behavioral changes and vulvar swelling several weeks prior to presentation. Exposure to a boar following her last farrowing was unknown.

On physical examination, the patient was estimated to be ~ 225 kg with a body condition score of 3/5. Her mammary chains palpated without abnormalities and no milk could be expressed from her teats. Her vulva was pale, with no evidence of swelling or discharge. All vital signs remained within normal limits throughout hospitalization.

Differential Diagnosis

Differential diagnoses considered were: pregnancy, macerated or mummified fetus, neoplasia, or a fibrous tissue adhesion from a previous uterine tear. Following removal of the uterus and evaluation, the fetus was suspected to have been retained from a previous parturition.

Treatment

Patient was sedated with 500 mg ketamine HCl injection (Ketaset®, Zoetis, Florham Park, NJ), 50 mg butorphanol (Torbugesic®; Zoetis, Florham Park, NJ) and 500 mg xylazine (AnaSed® LA; Vet One, Boise, ID) IV in the right auricular vein using a 20 gauge butterfly catheter set. Due to inadequate sedation, an additional 300 mg ketamine HCl injection (Ketaset®, Zoetis) and 200 mg xylazine (AnaSed® LA; Vet One) were administered IV in the left auricular vein. She was then transported to the surgical suite and placed in left lateral recumbency for intubation. An 11 mm (internal diameter) endotracheal tube was placed and the patient maintained on isoflurane (Fluriso™; Vet One). The patient was rolled into dorsal recumbency and the caudal and mid-abdomen was clipped and prepared using alternating 7.5% povidone iodine scrub and 70% isopropyl alcohol. A 20 gauge intravenous catheter was placed in the left auricular vein and 2 liters of Normosol-R (Hospira, Lake Forest, IL) were administered throughout the procedure. Flunixin meglumine (Banamine-S®, Merck Animal Health, Madison, NJ) 275 mg and 1250 mg ceftiofur crystalline free acid (Excede® For Swine, Zoetis) were administered IM behind each ear.

A 15 cm incision was made on the ventral midline 5 - 7 cm cranial to the sow's pelvis. The uterus was identified and a firm, fetus-like mass, ~ 15 cm in length, was palpated through the incision. Further evaluation of the of the right uterine horn confirmed the presence of a mass and ulcerative lesion (Figure 1) on the uterine serosa. With owner permission, the procedure was continued, adjusting the surgical plan from an ovariectomy to an ovariohysterectomy.

The right ovary was exteriorized and both a circumferential and a transfixation ligature were placed around the ovarian pedicle using 0 polydioxanone (PDS™, Ethicon, Somerville, NJ) absorbable suture. The right uterine horn was exteriorized and small segments of the broad ligament were sectioned for ligation, due to increased vascularization of the broad ligament. Ligation of the broad ligament vessels was achieved using 0 polydioxanone (PDS™, Ethicon) absorbable suture. The left ovary was exteriorized and ligated in the same manner as the right ovary. Due to increased vascularization within the broad ligaments, it was deemed advantageous to utilize a LigaSure™ (Covidien, Dublin, Republic of Ireland) for electrical hemostasis and cutting. The LigaSure™ (Covidien) was used to cauterize the remainder of the broad ligament on both sides. The uterine artery and veins of the uterine body were ligated using 0 polydioxanone (PDS™, Ethicon) absorbable suture with a Miller's knot. The LigaSure™ (Covidien) was then used to transect and seal the uterine vessels and body. A Parker-Kerr pattern was placed over the uterine stump using 0 polydioxanone (PDS™, Ethicon) absorbable suture. The abdomen was lavaged with sterile saline.

The abdominal wall was closed routinely using 2 polydioxanone (PDS™, Ethicon)-absorbable suture in a simple continuous pattern. The subcutaneous layer was closed using 2-0 polydioxanone (PDS™, Ethicon) absorbable suture, also in a simple continuous pattern. An intradermal pattern using 3-0 poliglecaprone 25 (Monocryl™, Ethicon, Somerville, NJ) was used to oppose skin edges. Uterine content and ovaries were examined (Figures 2 and 3).

Outcome

The patient recovered without complication from surgery and anesthesia. She remained in the hospital overnight for observation. She started eating the evening after surgery and multiple defecations occurred prior to discharge. Her pain was managed using 75 mg meloxicam (0.25 mg/kg; Cipla Ltd.,

Mumbai, India) orally once a day for 3 days. Several weeks after discharge, the patient was adopted by a farm animal sanctuary and exhibited no further signs of estrus. She is housed with several other neutered male and female pet pigs.

Discussion

To the authors' knowledge, the only reported case of a retained fetus in a sow was published in 1932.[6] However, the incidence is undoubtedly higher, as clinical signs of a retained fetus are vague and may only result in infertility or anestrus. Commercial sows and gilts with reproductive failure are frequently culled without further diagnostics. Rare cases may result in endometritis or metritis, due to fetal maceration with vaginal discharge and systemic disease. In the present case, a non-typical ulcerative lesion on the serosal surface of the uterus located adjacent to the retained fetus was attributed to pressure necrosis.

As routine sterilization is becoming an important part of companion swine medicine, this case is a valuable reminder to evaluate the entire reproductive tract before closure. Pet pig ovariectomies are gaining favor over ovariohysterectomies, as they are a simpler procedure and require shorter duration general anesthesia.[7] Swine have a long and tortuous uterus and it is important to thoroughly palpate the uterus for abnormalities, especially retained fetuses.

A retrospective analysis of any case often leads to further possible diagnostics and areas to improve case management and patient care. As history was vague in this case, performing a serum progesterone assay may have proved beneficial for confirming stage of the estrous cycle. However, although the ovaries had evidence of suspected recent ovulations, as supported by the presence of corpora hemorrhagica or young corpora lutea (Figure 3), a single progesterone sample may not have been diagnostic. Sera obtained 10 days apart were likely needed and not practical for this case. Further, obtaining a uterine culture may have assisted in antimicrobial treatment options if complications arose following surgery. The case is also a reminder of maternal recognition of pregnancy in swine and the fetuses' role in inhibiting luteolysis. Our patient likely resumed regular estrous cycles, despite the presence of a deceased fetus, as there was no embryonic signal for pregnancy and thus prostaglandins were likely released by the endometrium for effective luteolysis.

Learning Points

- Ovariectomies and ovariohysterectomies are becoming routine elective procedures for pet pigs.
- Thorough evaluation of the entire reproductive tract during traditional and laparoscopic ovariectomies is recommended.
- The rate of fetal mummification in domestic livestock species is highest among swine, with increased risk due to poor management, improper nutrition, environmental factors, mycotoxins and infectious diseases.

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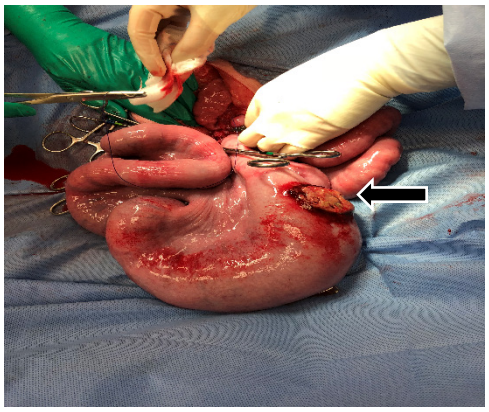

Figure 1. Uterus prior to removal; note the ulcerated lesion (arrow) and enlarged mass within right uterine horn.

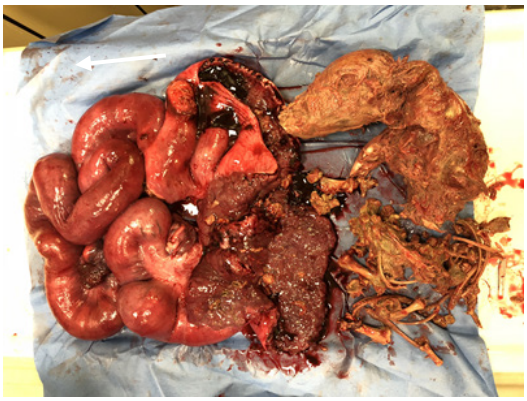

Figure 2. Retained fetus after removal from uterine horn.

Figure 3. Ovary with corpora hemorrhagica or early corpora lutea.