

Hysterotomy by a colpotomy approach for treatment of foetal mummification in a cow

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ABSTRACT

A 7-year-old Brahman cow was diagnosed as suffering from chronic foetal mummification of unknown aetiology, concurrent cystic ovarian disease, prolapse of the 2nd cervical ring and chronic cervicitis. Repeated treatment with prostaglandin F_{2α} and oestrogen failed to resolve the mummification. A hysterotomy was performed *via* an incision in the dorso-lateral vaginal wall. Good exposure of the uterine horn was achieved and mild post-operative complications were observed. Colpotomy can be regarded as an alternative surgical approach to the moderately enlarged bovine uterus.

Key words: cow, colpotomy, hysterotomy, mummification, mummified foetus, surgery, uterus.

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INTRODUCTION

Foetal mummification is a common consequence of foetal death between 3 and 8 months of gestation without loss of the corpus luteum⁴. Specific aetiologies include genetic factors, chromosomal abnormalities, placental defects, infectious agents, endocrine imbalances and pharmacological agents⁴.

Mummification generally does not cause permanent uterine pathology and fertility following prompt treatment is usually good^{2,4}. Treatment with agents that cause luteolysis and expulsion of the foetus is generally successful, although repeated treatment is sometimes required. Prostaglandin F_{2α} and analogues and oestrogenic compounds have been used with success. Glucocorticoids are ineffective because of the absence of a functional foeto-placental unit⁶.

Surgical removal of mummified foetuses is not generally recommended owing to the availability of effective abortifacients and cost implications. However, when medical treatment fails or the foetus is very large or the dam small, it may be indicated. Access to the uterus is gained *via* an abdominal incision. A ventral paramedian incision is recommended by some authors to gain exposure of the uterus, which is generally smaller than the normal gravid uterus³. Removal of a small mummy *via* an abdominal incision

is difficult owing to the caudal situation of the uterus.

The caudal flank approach has also been used for gaining access to the non-gravid uterus for recovery of embryos from the oviducts or unilateral hysterectomy^{5,7}.

The colpotomy approach is commonly used for ovariectomy of heifers and cows^{1,7}. This involves introducing an instrument or a hand through the vaginal canal and through an incision or perforation of the vaginal wall and peritoneum. The ovaries are then removed in the peritoneal cavity using specialised instruments or they may be withdrawn into the vagina and transected there. Alternatively, removal of the ovaries is achieved using a specialised instrument inserted through a colpotomy incision under guidance of a hand inserted into the patient's rectum⁷.

The use of a colpotomy approach for surgical manipulation of the bovine uterus has not been reported.

CASE HISTORY

The patient, a 7-year-old red Brahman cow, was presented 19 months after the previous calving with the complaint of returning to service despite being mated by 3 different fertile bulls. For the 5 months preceding presentation she had been cycling every 2–4 weeks. This period of cyclicity was preceded by a period of quiescence. No signs of disease had been noted at any time. Herd fertility was reportedly good and no diseases were

prevalent in the herd. A diagnosis of foetal mummification was made by a private practitioner 3 weeks before referral. No treatment was given.

On presentation the cow was alert and healthy, no abdominal distension was evident and the udder was involuted and inactive. The cow's perineal conformation was poor, but the vulva lips sealed well and no evidence of pneumo- or urovagina was seen.

The mummified foetus was easily identifiable on rectal palpation. The trunk was 12 × 7 × 3 cm, firm, non-crepitant and was situated in the uterine body and base of the left uterine horn. The foetal head was slightly crepitant and had a crown-nose length of 8 cm. The uterus was situated just cranial to the pelvic brim, and was thin-walled and atonic, with a small amount of fluid content. The cervix was moderately enlarged, particularly the external os, which had a diameter of 5 cm. The left ovary was intermediate in size with no identifiable structures. The right ovary was larger (4 × 3.5 × 3.5 cm), with 3 adjacent thin-walled cysts visible on ultrasound examination, the largest of which was 25 mm. Both ovarian bursas were patent and the fallopian tubes were not enlarged. Ultrasound examination concurred with the above findings.

Manual vaginal and speculum examinations showed a normal vaginal vault containing approximately 50 ml of a clear, mucoid discharge which appeared to be emanating from the cervix. The cervix was tightly closed with a 1-cm thick fold of the 2nd cervical ring protruding through the external os.

A sample of uterine content, collected using a guarded pipette, was subjected to microbiological examination. No organisms were visible on direct microscopic examination, no inflammatory cells were present and culture for *Trichomonas* and *Campylobacter* was negative. Serological examination for brucellosis and leptospirosis yielded negative results. Aerobic culture of the mummified foetal tissues after removal also rendered no growth after 72 hours.

The plasma progesterone concentration (PPC) was 2.27 nmol/l, confirming the

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Fig. 1: Uterus exposed at vulva lips, incision being made over mummified foetus.



Fig. 2: Sutured uterus before replacement into abdominal cavity.

absence of a corpus luteum.

A diagnosis of chronic foetal mummification, concurrent cystic ovarian disease, prolapse of the 2nd cervical ring and chronic cervicitis was made. The cause of foetal death could not be ascertained.

Treatment

Medical treatment aimed at inducing expulsion of the foetus using dinoprost (Lutalyse, Pharmacia & Upjohn) and estradiol cypionate (ECP, Pharmacia & Upjohn) followed by a 2nd dose of estradiol cypionate 3 days later, was unsuccessful. As the client was anxious to pursue all avenues of treatment despite the poor prognosis, removal of the mummified foetus by hysterotomy was considered. Owing to the small size of the foetus, access *via* a laparotomy incision was likely to be poor. It was decided to attempt removal using a colpotomy

approach.

The surgical procedure was as follows: the cow was restrained in a sturdy crush without clamping the neck. Preoperative preparation consisted of intramuscular injections of oxytetracycline (Engemycin 10%, Intervet SA), clenbuterol (Planipart, Janssen), acetylpromazine (Acepromazine 10 Injection, Centaur), and atropine (Atropine 10 Injection, Centaur), and caudal epidural anaesthesia with lignocaine (Lignocaine 2%, Centaur). The tail was lifted out of the operative field, the perineum was surgically prepared and the vagina flushed with a solution of chlorhexidine (Hibitane Solution, Hoechst Roussel Vet). Stay sutures were placed in the vulva lips and anchored to the gluteal skin, retracting the vulva lips dorsolaterally.

A stab incision was made in the left cranio-lateral vaginal fornix at the 11

o'clock position using a scalpel blade and was extended by a combination of sharp and blunt dissection. A stab incision was made through the peritoneum using the closed blades of a pair of sharp-sharp scissors. This hole was stretched until it permitted easy passage of a clenched fist. The left uterine horn containing the mummified foetus was located, grasped firmly and retracted through the peritoneal and vaginal incisions. Further retraction using both hands enabled good exposure of the gravid uterine horn at the vulva lips without excessive tension. Stay sutures were placed proximally and distally on the major curvature of the left uterine horn and the uterus was incised directly over the mummified foetus. No attempt was made to expose the right horn.

The mummified foetus was removed, a uterine biopsy collected and the lumen of the uterus irrigated with Ringers' Lactate (Intramed) solution. Closure of the uterus was by continuous inverting sutures using chromic catgut. The vaginal incision was not closed.

Postoperative treatment consisted of a single dose of oxytocin (Fentocin, Phenix), phenylbutazone and ramifenazone (Tomanol, Centaur), and daily doses of oxytetracycline for 3 days. Postoperative complications were limited to mild tenesmus and a poor appetite for a day following surgery.

The uterus was palpated 3 days after surgery and was found to be flaccid, contain a small amount of fluid content, and to be free of adhesions or other postoperative complications.

The ovarian cysts appeared to have luteinised during the course of the above treatment. The PPC on the day of surgery had risen to 12.06 nmol/l. Luteal tissue was present on the right ovary 3 days later, and the cow was treated with dinoprost. She was discharged the next day. Recovery following discharge was uneventful, although she was reported not to be in calf 7 months later.

Histopathological examination of a uterine biopsy collected during the surgery showed a mild acute multifocal ulcerative endometritis with no evidence of an infectious aetiology.

DISCUSSION

The crown-nose length of this foetus indicates a gestational age of approximately 3 months, which is consistent with the reported stage of occurrence of mummification^{4,6}. While the duration of the foetal mummification could not be ascertained with certainty, it was deduced from the history that luteolysis probably occurred



Fig. 3: Mummified foetus after removal by colpotomy approach.

5 months before diagnosis of the mummification. The inability to make an aetiological diagnosis for the foetal loss was typical for most cases of mummification on account of the protracted delay between foetal death and expulsion².

The absence of a corpus luteum and the presence of cystic ovarian disease in this case was unusual. This would account for the lack of response to luteolytic doses of prostaglandin F_{2α}. No specific reason was identified for the lack of response to repeated doses of oestrogen. However, the cervical pathology may have rendered it unable to dilate in response to the treatment. It is not known why the foetus was not expelled despite low plasma progesterone levels, but cervical pathology is one possible explanation.

The colpotomy approach gave excellent exposure of the uterus. The sloping perineum of this particular individual undoubtedly facilitated exposure. However, good exposure of the uterus should be possible in most animals *via* this approach. Other advantages of the colpotomy approach over flank incisions are the ability to perform the procedure in the standing animal, obviating the need for general anaesthesia or deep sedation, and the decreased risk of wound dehiscence.

Minor postoperative inappetence and discomfort were seen in this case. Simultaneous perforation of the vaginal wall and peritoneum using a sharp instrument as described elsewhere was reportedly an elegant means of entering the peritoneal cavity and could be expected to cause less dead space than the incision method described here, possibly minimising the postoperative complications¹. This method was not used in the present case owing to the danger of perforation of the rumen should a sharp instrument have been used to make a puncture in the left vaginal fornix.

The infertility encountered in this cow following treatment is not unexpected. The combination of cervical pathology, ovarian pathology, poor perineal conformation, foetal mummification and lack of response to conservative treatment rendered the prognosis for fertility poor.

The economic justification for a surgical procedure in a case with a poor prognosis is questionable. However, exceptional circumstances and other indications may force consideration of the option of surgery. Colpotomy, which can be done in a standing animal and does not require incision and closure of the abdominal musculature, is a cheaper procedure than

previously described surgical approaches to the bovine uterus, owing to reduced time, materials and labour requirements.

Based on this case, the colpotomy approach should be considered whenever surgical exposure of the moderately enlarged uterus is required.

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