

Surgical uterine drainage and lavage as treatment for canine pyometra

K G M DE CRAMER

ABSTRACT

Keywords: Pyometra, dog, uterine lavage.

Pyometra is a common post oestral syndrome in bitches. Classical treatment consists of either ovariohysterectomy or medical intervention. Surgical uterine drainage and lavage via direct trans-cervical catheterisation using a 5% povidone-iodine in saline solution was performed successfully in 8 bitches with pyometra. All bitches conceived and whelped without complications subsequent to this treatment. It is concluded that this method offers an effective alternative treatment for canine pyometra with shorter recovery times as well as good clinical recovery and pregnancy rates in bitches destined for further breeding.

INTRODUCTION

Pyometra is typically a post oestral syndrome in adult bitches associated with a variety of clinical and pathological manifestations of genital and multisystemic disease. A purulent vaginal discharge may however be the only symptom in some cases of pyometra when the cervix is open. It is postulated that intrauterine bacteria, which ascend from the vagina during pro-oestrus and oestrus, induce the disease during metoestrus by acting on the progesterone-primed endometrium. There is a clear association between cystic endometrial hyperplasia (CEH) and pyometra. CEH is a progressive degenerative process and is generally accepted to be the initiating lesion and contributes to failure to shed normally transient uterine infections by compromising the uterine environment and/or local defence mechanisms. Parity and age are significant risk factors in the development of pyometra. As pyometra may have fatal complications, clients opting to retain their bitch's reproductive capacity should be warned of potential risks of medical or surgical treatments. Clinical improvement of pyometra cases have been associated with reduction in plasma progesterone concentrations, increased vaginal discharges, reduction in diameter of the uterus as determined by ultrasonography, normalisation of haematological and biochemical profiles. Treatment of canine pyometra with prostaglandins (PG) is successful with clinical recovery rates approaching 80 % and post treatment pregnancy rates attained varying from 40% to 80%. Prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) facilitates smooth muscle contraction in the uterine wall leading to expulsion of uterine contents in cases of pyometra. It is this expulsion of uterine contents in part that is suspected to be responsible for recovery. The duration of prostaglandin administration is thus dictated by the uterine dimension, time it takes for vaginal discharges to subside and ultimately return of the WCC to normal and clinical normality. There are cases of canine pyometra refractory to $PGF_{2\alpha}$ therapy and cases that recur at subsequent cycles. The uterine drainage and lavage as illustrated in this study was performed in an attempt to shorten the duration of treatment of pyometra in the bitch as well as achieve both high clinical recovery and pregnancy rates post treatment.

CASE SELECTION

Any bitch that developed pyometra was automatically included in the trial irrespective of age or breed until 8 bitches were completed. All showed an enlarged fluid filled uterus on ultrasonography and typical leucogram changes. Two of the eight bitches; the Kanaan and the Greyhound showed severe signs of depression, dehydration, severe tachycardia, toxic mucous membranes and anaemia. A vaginal discharge was noted in 5 of the bitches. Five of the eight bitches were multigravid whereas 3 were maiden and all were 5 years or older. Prior to antimicrobial therapy, a deep vaginal guarded swab was collected and sent for culture and sensitivity studies.

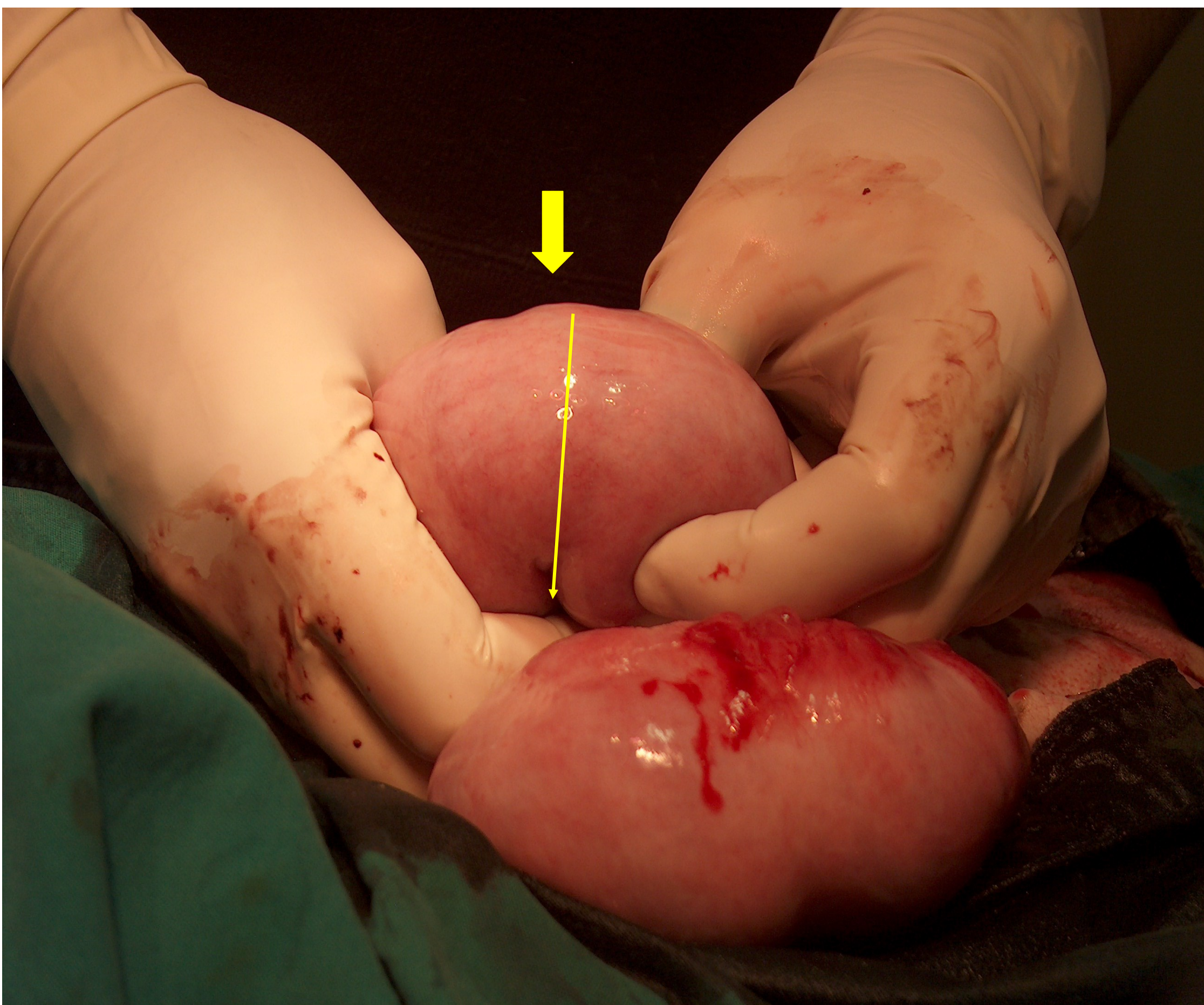


Figure 2 Surgeon exteriorised uterine horn. Note diameter of horn (yellow arrow)

POST-SURGICAL CASE MANAGEMENT

Fluid therapy at maintenance rates was administered for the first day following surgery. The results of the culture and sensitivity tests revealed that either the Synulox and/or Gentamycin were effective against all the 6 out of 8 samples tested. The appetite, habitus, vital signs and volume and nature of any vaginal discharge were recorded daily for 14 days post surgery. The colour of the vaginal discharges varied from a light straw colour to dark brown and appeared to be muco-purulent in nature. The volumes were scant and subsided in all but one bitch by day six. One bitch showed a vaginal discharge for 12 days. All the bitches ate normally within 2 days of surgery. A blood sample revealed that the WCC had returned to normal in all the bitches.

THE SUBSEQUENT OESTRUS CYCLE

At the first signs of pro oestrus, the bitches were presented for routine oestrous monitoring. The bitches were all treated empirically with 20mg/kg clavulanate potentiated Amoxycillin (Synulox, Beecham Pharmaceuticals) from the time of first mating until 5 days into the subsequent dioestrus. The inter oestrus interval (IEI) appeared to be unaffected by the surgical intervention. The bitches all showed a normal oestrous cycle and were mated at least twice each, every alternate day from the first day of standing heat until dioestrus. All the bitches conceived and whelped normally. The litter size was considered normal in all but one of the bitches.

PRE-SURGICAL THERAPY

Two cases presented in severe shock and were first stabilized by using shock therapy. As soon as the diagnoses of pyometra was made, all the bitches were treated with broad spectrum antibiotics until the result of the antibiogram indicated the use of other antibiotics. The surgical flushing commenced within 48 hours of the diagnosis.

SURGICAL METHOD

The flushing medium selected was a 50:50 mixture of "Betadine" (povidone-iodine 100 mg/ml, Adcock-Ingram) and normal saline to constitute a 5% betadine-saline mixture. The eight bitches were premedicated and anaesthetised in standard fashion and were prepared surgically as for a laparotomy. In addition to a surgeon and a surgical assistant, the procedure required a third assistant to manipulate the irrigation pipette and flushing medium (the "non-sterile assistant", see Figure 1). A standard abdominal mid-line incision was made to allow exteriorisation of the uterine body (see Figure 2) and localisation of both cervix and vagina. The non sterile assistant introduced a sterile proctoscope into the vagina as far cranially as possible before removal of the introducer from the proctoscope. A sterile bovine artificial insemination pipette with syringe attachment was introduced via the lumen of the proctoscope and advanced cranially until the surgeon was able to locate its tip through the vaginal wall. The non sterile assistant then removed the proctoscope from the vagina. The surgeon located the tip of the pipette with one hand and simultaneously stabilised the cervix with the other hand. The non sterile assistant carefully advanced the pipette cranially until the pipette was in close proximity to the cervix. The surgeon then manipulated the cervical opening onto the tip of the pipette and slid the cervix over the pipette. The tip of the pipette was palpable in the uterine body and visible when pushed against the uterine wall (see Figure 3). The non-sterile assistant then attached a 50 ml syringe to the end of the pipette. Considerable care was taken to ensure that no pus was forced into the abdomen via the fallopian tubes. The volume infused in the uterus at any one time depended on the size of the uterus and varied between 20 and 50 ml. The surgeon massaged the uterine wall of the uterus, mixing the exudate and flushing medium. The non sterile assistant thereafter aspirated the contents of the uterus back into the syringe prior to emptying the syringe, re-filling and injecting more flushing medium into the uterus. This was repeated until that part of the uterus was evacuated. The aspirated exudate initially appeared purulent and viscous. It changed from a thick viscous consistency to a watery consistency (see Figure 5) and resembled the colour of the introduced flushing medium as the procedure progressed. A volume range of 300 – 500 ml was used to flush the entire uterus. As the viscosity of the uterine content decreased, this content was observed to escape from around the catheter into the vagina. As the procedure progressed the uterine dimensions were observed to decrease (see Figure 4). The surgical wound was closed using a standard method. No difficulty was encountered in passing the pipette through the cervix or guiding it into the uterine horns in any of the bitches including the 3 bitches that did not show vaginal discharges and were considered to be closed cervix pyometra cases. The entire procedure was uneventful in all the bitches.

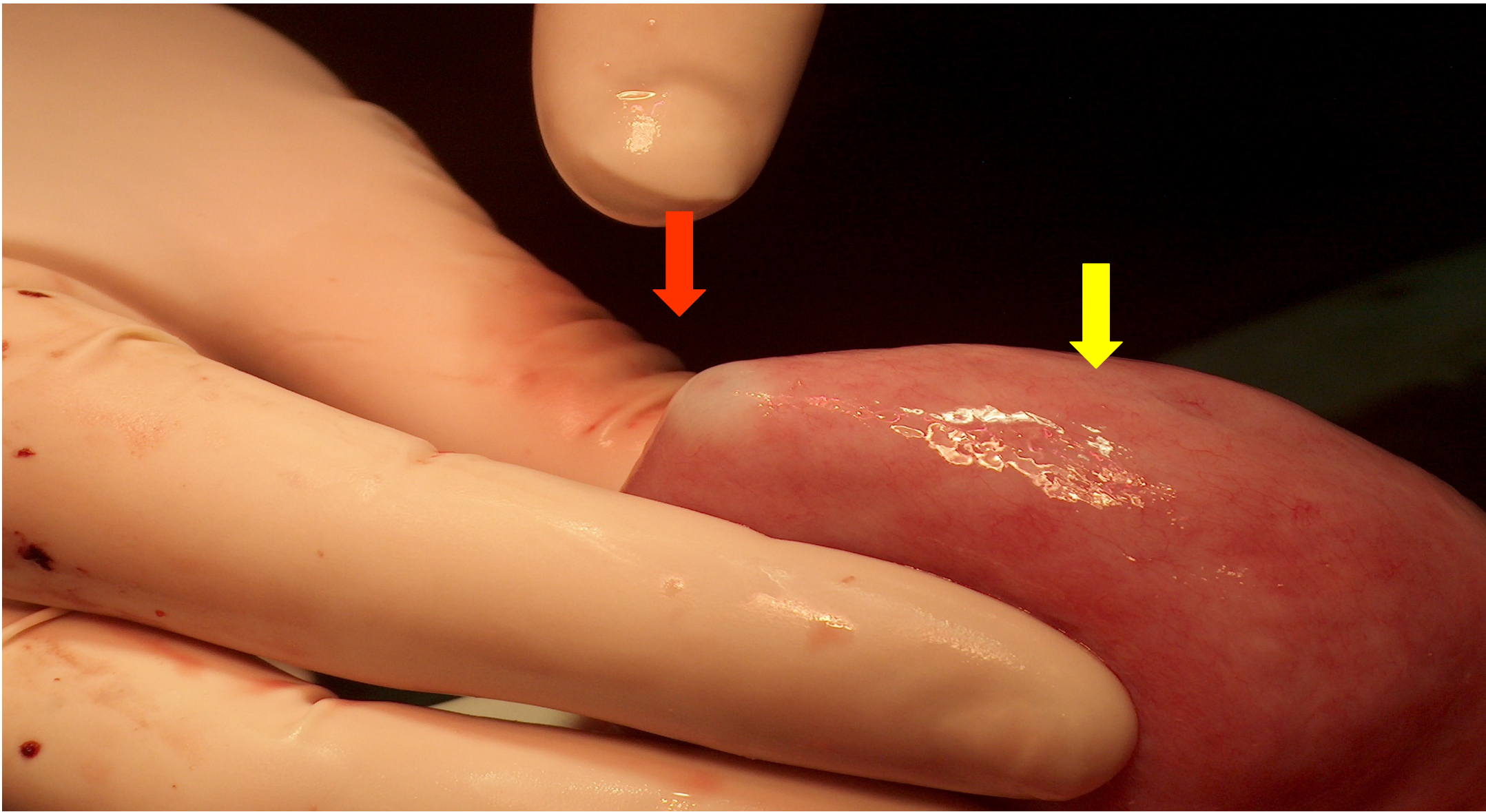


Figure 3 Surgeon holding uterine body with tip of pipette visible through uterine wall (red arrow). Yellow arrow points to stretched wall of a pus filled diseased uterus

DISCUSSION

This is the first report on the use of intra-uterine antiseptics in bitches. The results obtained in this study show that the duration of treatment was 12 days or shorter which compares favourably with other studies and the 100% recovery and pregnancy rates achieved exceeds any of those in previous studies. A possible explanation for its success may be the extent whereby the septic exudate was efficiently removed from the uterine lumen by direct manual manipulation and a significant reduction in diameter of the uterus achieved during the flushing procedure. It is speculated that this was achieved by both the physical effect of flushing as well as manual manipulation and "milking" of the uterus itself. The success of the current method described may in part be explained by the efficient expulsion of uterine contents as is the case when PG is used. The choice of antiseptic used is important. Povidone iodine proved safe and efficient in this study. Unlike local antibiotics and some other antiseptic substances, no resistance has been reported with povidone-iodine. It was very clear that the mixing of the flushing media into the uterus led to a significant reduction in the viscosity of the exudates and this eased the flushing procedure as it progressed but must also have aided in improved drainage post surgery. It is the author's opinion that the removal of the exudates from the uterus, as evidenced by reduction in uterine diameter, must have been one of the main contributing factors to successful and shorter course of treatment achieved. The direct irritant properties might also have had a stimulating and rejuvenating effect on the endometrial epithelium.

The beneficial effects of drugs such as $PF_{2\alpha}$, prolactin inhibitors and antigestagens in the treatment of pyometra may be due to their effect on reducing the action of progesterone on the uterus. These drugs may, through mechanisms such as opening the cervix and increasing uterine contractility, be beneficial adjuncts to uterine lavage. In this study the three cases considered to have a closed cervix pyometra, the cervix was easily passed using direct manual manipulation. In this study, the possibility of the flushing procedure and/or media inducing any uterine pathology was not established. The fact that all the bitches whelped normal-sized litters for their breed in the first cycle following flushing, indicates that uterine pathology was either insignificant or absent. Information is lacking as to whether the extent and degree of CEH may be in any way reversed or altered by any medication and/or surgical intervention as demonstrated by histopathology before and after such interventions. Further studies may also highlight whether uterine drainage and lavage might be efficacious in cases refractory to PG treatment.

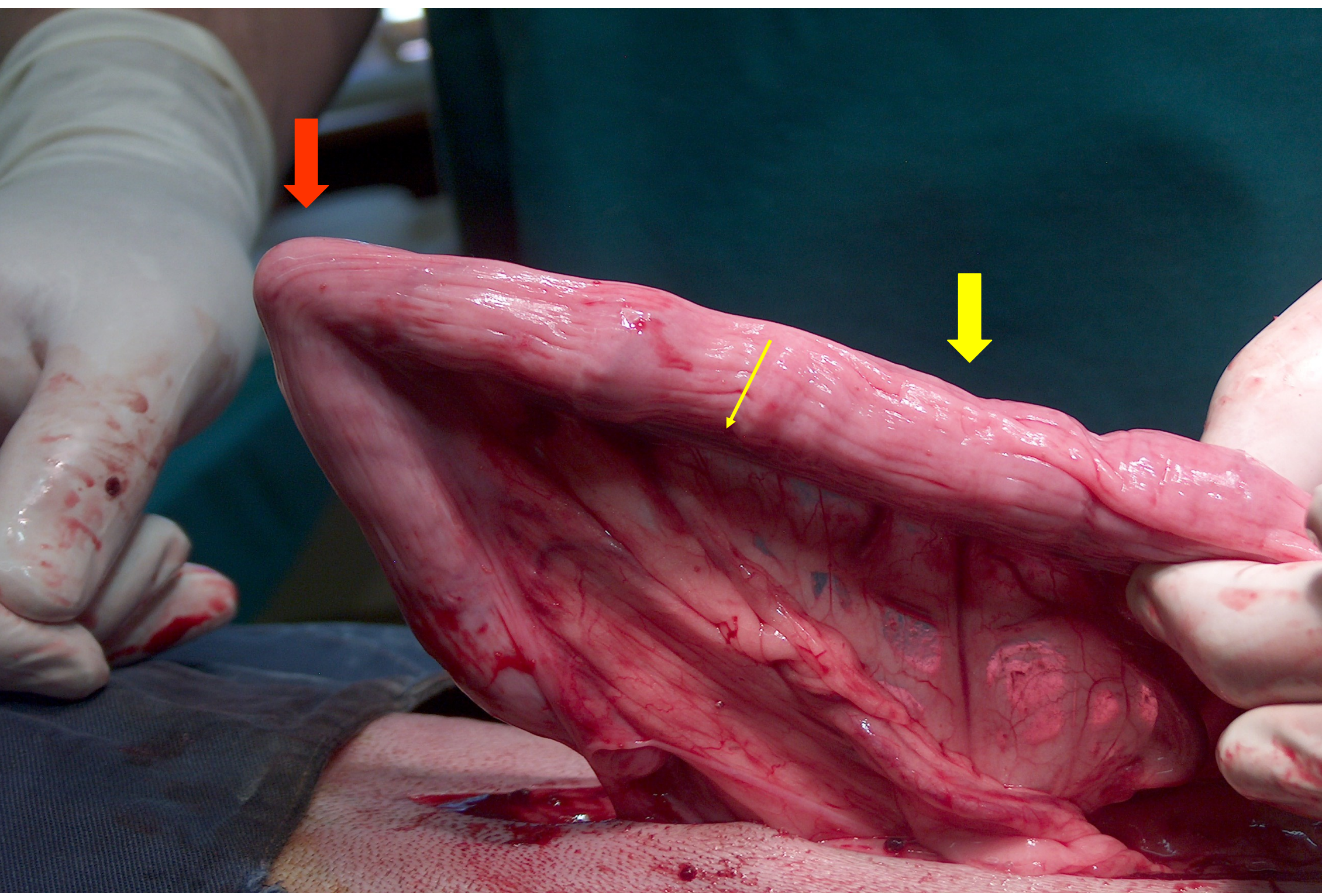


Figure 4 Surgeon holding uterine horn which is now emptied and pipette tip visible through uterine wall at red arrow. Yellow arrow points to the uterine wall which is by now not stretched and decrease in uterine diameter is clearly visible

CONCLUSION

In conclusion, this study shows that surgical uterine drainage and lavage offers an effective alternative treatment for canine pyometra with shorter recovery times as well as good clinical recovery and pregnancy rates. In bitches destined for further breeding. These results justify further studies with more cases to establish whether this method is statistically advantageous over current methods. It would also be of interest to establish whether this method could be used in conjunction with recognized methods in order to optimise a treatment regimen for canine pyometra.

REFERENCES

De Cramer K G M 2010 Surgical uterine drainage and lavage as treatment for canine pyometra. *Journal of the South African Veterinary Association* 81: 172-177 and others cited in article

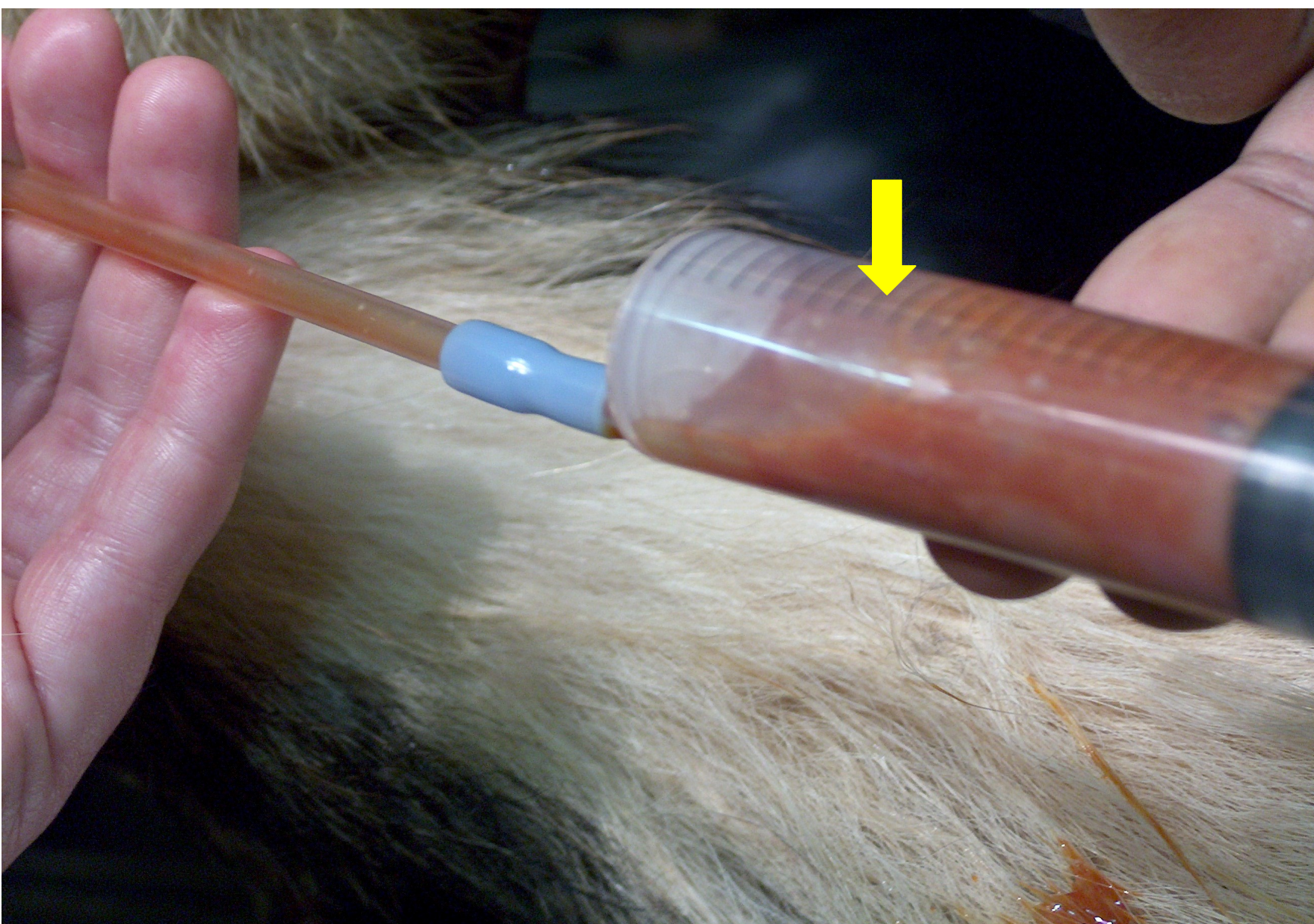


Figure 5 Non sterile assistant suctioning uterine content which is clearly a mixture of puss and the flushing media