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Clinical endometritis following spontaneous postpartum and cesarean section in Friesian Holstein cows: a case series

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ABSTRACT: Endometritis is an inflammatory disorder of the endometrium commonly associated with postpartum conditions, dystocia, and cesarean sections in dairy cows. This case series describes the clinical presentation and therapeutic outcomes of clinical endometritis in two multiparous Friesian Holstein (FH) cows following postpartum and post-cesarean conditions. Diagnosis was established based on reproductive history, clinical examination, transrectal palpation, and Metricheck evaluation (score 2/3). Both cows were treated with ceftiofur-based antimicrobial and supportive therapy, and follow-up reports indicated complete resolution of vaginal discharge, suggesting favorable clinical outcomes. These cases highlight the value of practical field diagnosis and timely treatment for clinical endometritis under field conditions.

Keywords:
cesarean section, clinical endometritis, Friesian Holstein cow, Metricheck score, postpartum disorder

■ INTRODUCTION

Endometritis is defined as inflammation of the uterine endometrium without systemic illness, typically occurring beyond 21 days postpartum (Sheldon *et al.* 2006). It represents one of the most prevalent reproductive disorders in dairy cattle worldwide, causing delayed uterine involution, prolonged days open, increased insemination indices, and substantial economic losses (Yáñez *et al.* 2022, Hermadi *et al.* 2025). Predisposing factors include dystocia, retained fetal membranes, metabolic imbalances, and hygiene deficiencies during calving.

Surgical interventions, such as cesarean sections, significantly increase the risk of severe uterine contamination and bacterial endometritis due to prolonged tissue exposure, surgical trauma, and compromised local immune responses (Adugna *et al.* 2022). Although diagnostic techniques, such as transrectal ultrasonography and endometrial cytology, offer high accuracy, their application remains limited under field conditions in developing regions. This case series aimed to evaluate the clinical features, field diagnostic strategies, and therapeutic responses of clinical endometritis secondary to spontaneous postpartum and post-cesarean conditions in Friesian Holstein (FH) cows.

■ CASE

Case 1: A 7-year-old multiparous FH dairy cow (parity 5; BCS 3/5), one month postpartum, presented with a one-week history of intermittent mucopurulent vulvar discharge. Vital parameters were within normal limits, and Metricheck examination revealed mucopurulent vaginal discharge (score 2/3). Clinical endometritis was diagnosed based on reproductive history, clinical findings, transrectal palpation, and Metricheck evaluation after excluding physiological lochia, pyometra, and vaginitis. Treatment consisted of Ceftiofur hydrochloride (Dufafur 5% Inj, Interchemie, Castenray, Netherlands) 1 mL/50 kg BW, IM, once daily for 3 days, Multivitamin A, D3, E (Vitol 140, Interchemie) 10 mL, IM, and Ketoprofen (Ketosol 100, Interchemie) 1 mL/33 kg BW, IM, once daily for up to 3 days. The prognosis was considered fausta. Follow-up by the owner indicated complete resolution of vaginal discharge

Case 2: An 8-year-old multiparous Friesian Holstein cow (parity 6; BCS 2.5/5), with a history of cesarean section for dystocia six months earlier, presented with a two-week history of persistent mucopurulent vulvar discharge after two

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unsuccessful artificial inseminations. The cow had mild pyrexia (38.8°C), dehydration, a thickened and tense uterus on transrectal palpation, and mucopurulent vaginal discharge (Metricheck score 2/3). Clinical endometritis was diagnosed based on reproductive history, clinical findings, transrectal palpation, and Metricheck evaluation after excluding pyometra and vaginitis. The cow received the same doses, routes, and duration of Dufafur 5% Inj, Vitol 140, and Ketosol 100 as in Case 1. The prognosis was fausta. Re-examination one week after treatment showed complete resolution of vaginal dis-charge, and Metricheck evaluation yielded a score of 0/3.

■ RESULTS AND DISCUSSION

Based on anamnesis, both cows presented with muco-purulent vaginal discharge (Metricheck score 2/3), consistent with clinical endometritis; however, their reproductive histories and clinical severity differed. Cow 1 developed endometritis during the postpartum period following normal calving and remained clinically stable, whereas Cow 2 had a history of dystocia managed by cesarean section, followed by repeated artificial insemination failure, and exhibited pyrexia, dehydration, and uterine thickening. Despite identical Metricheck scores, these findings suggest a more pronounced systemic inflammatory response in the post-cesarean cow. Dystocia, cesarean section, and repeated intrauterine manipulation are recognized risk factors for bacterial uterine contamination, delayed uterine involution, and the development of clinical endometritis (Adugna *et al.* 2022). The presence of muco-purulent discharge (Metricheck score 2/3), indicating ≤50% purulent material according to Sheldon *et al.* (2006) (Figure 1), supports the diagnosis of active uterine inflammation and has been associated with reduced reproductive performance (Hermadi *et al.* 2025).

Although transrectal ultrasonography and endometrial cytology are recommended to improve the diagnostic accuracy of endometritis, these procedures were not available under field conditions. Therefore, diagnosis was established using reproductive history, clinical examination, transrectal palpation, and Metricheck evaluation. These cases demonstrate that cows with similar Metricheck scores may differ in systemic clinical status, emphasizing that vaginal discharge scoring should be interpreted together with a comprehensive clinical examination rather than as a standalone diagnostic criterion.



Figure 1. Metricheck examination showing mucopurulent vaginal dis-charge (Metricheck score 2/3) in Cow 1 (A) and Cow 2 before treat-ment (B), and complete resolution of vaginal discharge with Metricheck score 0/3 in Cow 2 at follow-up (C). Metricheck scoring was based on Sheldon *et al.* (2006).

Both cows responded to ceftiofur-based therapy and support. In case 2, examination confirmed resolution of discharge with a Metricheck score of 0/3, whereas in case 1, follow-up confirmed no discharge. Although limited to two cases, these observations underscore the importance of early recognition, assessment, and timely treatment of clinical endometritis in dairy cows. Systemic ceftiofur hydrochloride was selected for endometrial and myometrial penetration without milk withdrawal, an economic factor in dairy operations. Ketoprofen provides anti-inflammatory and analgesic support, reducing edema and pyrexia (Dogru & Pancarcı 2024). Third-generation cephalosporins should be used only when susceptibility testing is available.

■ CONCLUSION

Clinical endometritis in dairy cows varies with risk factors, with post-cesarean cases posing risks of chronic inflammation and systemic involvement compared to spontaneous postpartum cases. Metricheck scoring with assessment enables diagnosis and monitoring. Systemic antimicrobial and supportive therapies achieved resolution under field conditions.

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■ ETHICS AND DECLARATIONS

Conflict of interest: The authors declare no conflict of interest. **Ethical approval & owner consent**: Informed consent was obtained from the animal owners prior to clinical procedures and data collection.

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