



Therapeutic Management of Anovulatory Follicle using CIDR Based protocol in a Repeat Breeder Heifer

Anshul Chandel¹ and Madhumeet Singh^{2*}

¹Veterinary Officer, Dhauladhar Nature Park Gopalpur, Kangra, Himachal Pradesh

²Department of Veterinary Gynecology and Obstetrics, Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishwavidyalaya, Palampur, HP, India

ABSTRACT

A Controlled internal drug releasing device (CIDR)- Prostaglandin F_{2α} (PGF_{2α}) based estrus synchronization protocol and post-insemination CIDR application led to successful conception and parturition in a repeat breeder anovulatory heifer.

Key words: Repeat breeding, CIDR, Anovulation, PGF_{2α}

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INTRODUCTION

Anovulation is the failure of ovulation that leads to true anestrus or cystic ovarian disease. Such cows have abnormal follicular development and estrous cycles (Parmar, 2015). Sometimes, anovulation is observed with the follicle regressing and becoming atretic. In such a situation, a new follicular wave initiates, leading to the selection of a new dominant follicle (Peter *et al.*, 2009a).

Diagnosis of anovulation can be made retrospectively by noting on transrectal palpation or ultrasonography, that a follicle persisted longer than expected (Noakes *et al.*, 2001). Treatment that increases circulating concentrations

of progesterone can help in the therapeutic management of the condition by increasing Gonadotrophin releasing hormone (GnRH)/ Luteinizing hormone (LH) pulses and allowing the final stages of follicular growth or resetting the hypothalamic responsiveness to the positive feedback effect of estradiol (Das *et al.*, 2007). The method of choice would be 7-10 days of treatment with progesterone releasing device in addition to Prostaglandin F_{2α} (PGF_{2α}) injection 1-2 days before removal of the device (Peter *et al.*, 2009b). This communication provided detail of a successful therapeutic management of anovulatory repeat breeding heifer with CIDR-PGF_{2α} based estrus synchronization protocol and post-insemination CIDR application.

*Corresponding author.

E-mail address: madhumeet2004@gmail.com (Madhumeet Singh)

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CASE HISTORY AND OBSERVATIONS

A 2-year-old repeat breeder heifer with a history of repeated estrus and failure off conception following five times artificial insemination was presented to the Teaching Veterinary Clinical Complex, DGCN College of Veterinary and Animal Sciences, Palampur. The inter-estus interval was 20-22 days, with no his-tory of metestral bleeding. The animal showed signs of bellowing and mounting on estrus. On clinical exam-

ination, the vulvar mucous membrane was found to be congested and edematous. Observations on per-rectal examination included an open cervix with a clear and hanging discharge with a good uterine tone. A sample of cervical discharge was collected for a culture sensi-tivity test to rule out the infectious cause of infertility. On ultrasonographic examination, there was a domi-nant follicle (12.2mm x13.0 mm; Fig “A”) on the right ovary. On the left ovary, there were multiple small fol-licles. There was no turbidity in the nutrient broth after 24 hours of incubation of cervical discharge.

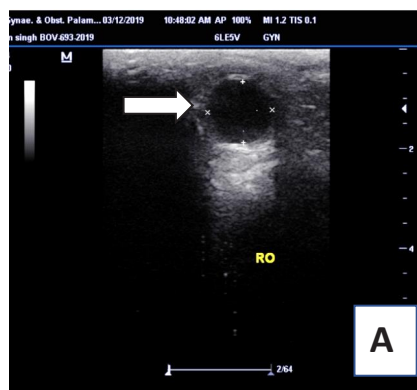


Fig A: Dominant follicle on right ovary on the day of estrus (white arrow)

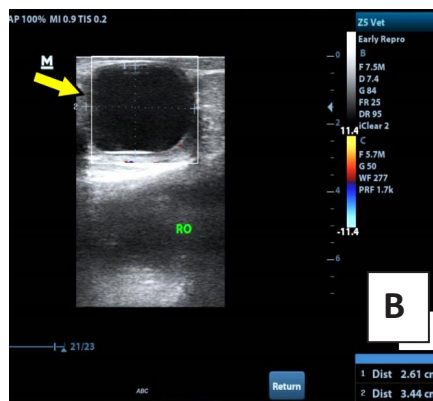


Fig B: Anovulatory follicle (26.1mm X 34.4mm) on the same ovary on day 7 post-estrus (Yellow arrow)

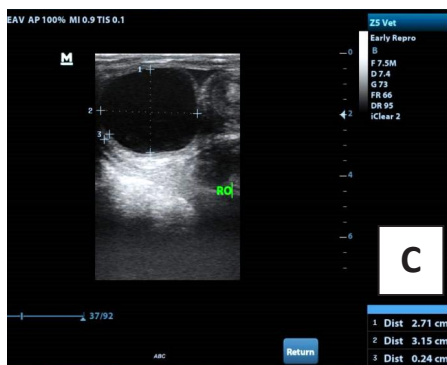


Fig C: Unchanged anovulatory follicle on day16 post-estrus



Fig D: Newly developed follicle (11.5mm X 12.6mm) on the same ovary (White arrow) besides anovulatory follicle on day 16 post-estrus

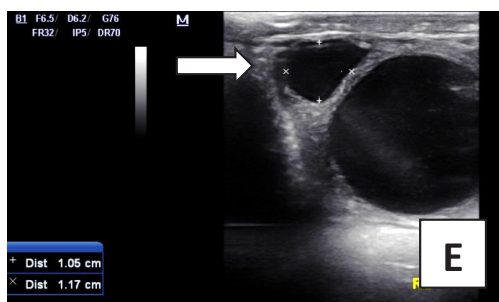


Fig E: dominant follicle (10.5mm X 11.7mm) on the 1st day of FTAI (white arrow)

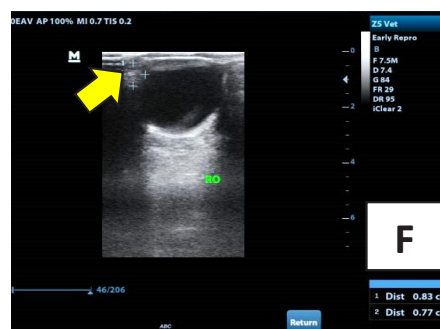


Fig F: disappearance of dominant follicle on 2nd day of FTAI (yellow arrow)

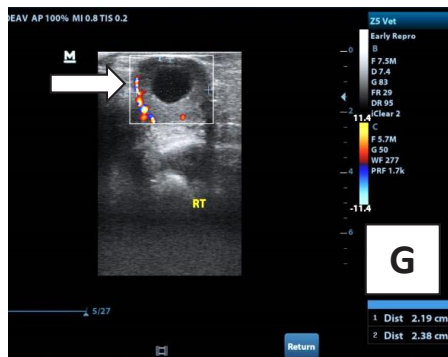


Fig G: functional CL (red and blue hue) with cavity on right ovary on day 12 post AI (21.9mm X 23.8mm; white arrow)

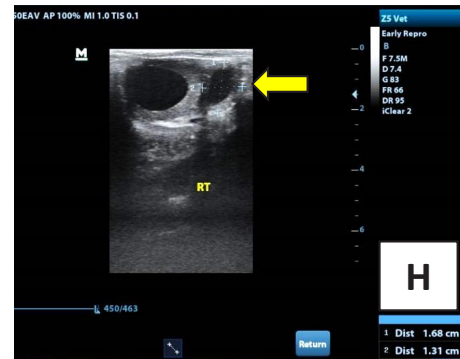


Fig H: regressed anovulatory follicle (16.8mm X 13.1mm; yellow arrow)

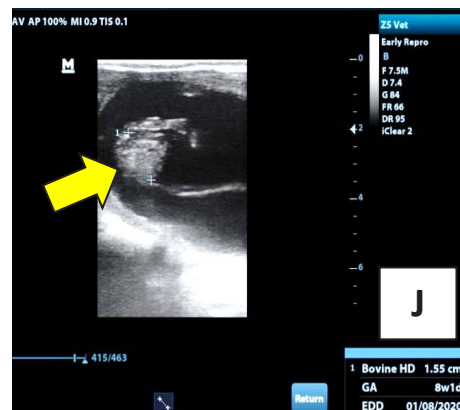
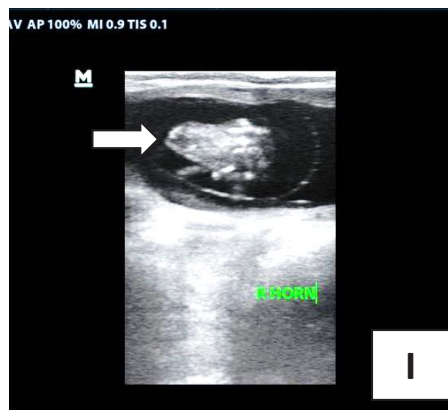


Fig I & J: Pregnancy diagnosis (Foetal head; White arrow) and calculation of gestation age after 45 days of AI (Yellow arrow)

Fig.1. Ultrasonographic monitoring of follicular dynamics following CIDR-PGF_{2α} synchronization protocol and post-insemination CIDR application in an anovulatory heifer

TREATMENT AND DISCUSSION

It was decided to synchronize the animal for estrus by CIDR-PGF_{2α} protocol (CIDR insertion on day 7 post-estrus for 9 days and PGF_{2α} administration one day before CIDR removal) for fixed-time AI. On day 7 post-estrus, the per-rectal observations were as follows; the right ovary was large, smooth and round with a fluid-filled consistency, whereas, the left ovary was small and irregular. On ultrasonography, a large anechoic follicle (26.1mm x 34.4mm; Fig “B”) with a thickened wall (3.0mm) was observed on the right ovary. There was no CL on any of the ovaries as it has been in a normal estrous cycle. Therefore, it was diagnosed to be a case of anovulation. The CIDR (Eazi-breed CIDR, Zoetis Pharma, 1.38 gm progesterone) was placed intravaginally for 9 days (from day 7 to 16) and 500mcg PGF_{2α} (Pragma injection; Intas Pharmaceuticals Ltd. containing Cloprostenol 250 mcg/ml) was administered on day 15 (day before CIDR removal) as per the protocol.

On the day of CIDR removal, no difference was observed in the ovaries per-rectally, however, on ultrasonographic examination, a new follicle (11.5mm x

12.6mm; fig “D”) had emerged beside the previous anovulatory follicle (27.1mm x 31.5mm; Fig “C”). Two fixed-time artificial inseminations (FTAI) were carried out at 48 and 72h after CIDR removal. On the day of the FTAI at 48h, the size of the dominant follicle was 10.5mm x 11.7mm (Fig “E”). However, next day i.e., FTAI at 72h, the dominant follicle had disappeared, confirming ovulation (Fig “F”).

CIDR was again placed intravaginally on day 12 post AI for 9 days to avoid early embryonic mortality by providing extra source of progesterone. The ultrasonographic observations on day 12 post AI were as follows; a new CL (21.9mm x 23.8mm; Fig “G”) was there on the right ovary, while the anovulatory follicle had regressed (16.8mm x 13.1mm; Fig “H”). CIDR was left for 9 days intravaginally. The animal was examined for pregnancy diagnosis 45 days post AI per-rectally as well as ultrasonographically (Fig “I” & “J”) and found pregnant. The animal calved uneventfully giving birth to a live healthy female calf.

Progesterone supplementation in the form of intravaginal progesterone inserts (CIDR, 1.38 g) has been reported

to help in the resumption of cyclicity in anovulatory cows in comparison to untreated cows as well as providing priming with progesterone resulting in reduced incidence of short luteal phases after artificial insemination (Cerri *et al.*, 2009). In this case, pre-insemination insertion of CIDR acted as an artificial corpus luteum in the absence of endogenous corpus luteum, leading to priming of the reproductive system which was favourable for the better development of the preovulatory follicle and timely ovulation and thus, occurrence of successful conception subsequently (Reshma *et al.*, 2018).

CONCLUSIONS

It was concluded that a Controlled internal drug releasing device (CIDR)- Prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) based estrus synchronization protocol and post-insemination CIDR application resulted in treatment of anovulatory follicle with successful conception in a repeat breeder anovulatory heifer.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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