THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
Jan, 2025 Vol.5(1), 6012−6019

Popular Article

Trans-gluteal aspiration of ovarian follicular cyst: A novel field-based technique to treat non-responsive follicular cyst

[1]A. Thangamani, [2]S. Manokaran[*], [3]T. Sarath, [1]A. Reshma, [4]R. Rajkumar and [5]A. Elango
[1]Assistant Professor, [2]Professor & Head, Veterinary Gynaecology and Obstetrics
[3]Associate Professor & Head, [4]Assistant Professor, Veterinary Clinical Complex
[5]Dean, Veterinary College and Research Institute, Salem-636 112
Tamil Nadu Veterinary and Animal Sciences University
DOI:10.5281/ScieneWorld.14680062

Abstract

In recent days there is an increasing the incidence of follicular cyst in dairy cows due to hormonal imbalance and crossbreeding policy. Some of the follicular cysts are not responding to routine hormonal treatment protocol followed at field. Hence, they are referred as 'non-responsive' follicular cysts, which can be addressed by a novel, minimal invasive technique called *trans-gluteal aspiration* of ovarian follicular cyst. The present manuscript elaborated the different perception on follicular cyst by the researchers and various diagnostic methods to differentiate the type of ovarian cyst and step wise procedure for trans-gluteal aspiration technique.

Keywords: Non-responsive follicular cyst, Trans-gluteal approach, Ultrasonography, Progesterone, Luteal cyst, Cystic corpora lutea

Introduction

Ovarian cyst (OC) is an important ovarian disorder and cause major reproductive failure in dairy cows and buffaloes. It affects the length of the estrous cycle from the routine 18-21 days length and in turn affects the fertility. Preponderance of ovarian dysfunctions during the postpartum period is formation of cyst following failure of ovulation in stipulated time. The condition has been denoted by various names *viz*., adrenal virilism, nymphomania, cystic ovarian degeneration (COD), cystic ovaries and ovarian cysts. An aberrant LH surge event may be the reason for the development of follicular cyst. This abnormal LH release pattern appears to be caused by an altered feedback mechanism of oestrogens on the central hypothalamo-pituitary axis. Altered follicular growth and development disrupting the hypothalamo-pituitary axis is also responsible for development of cyst (Vanholder *et al*., 2006). Diagnosis of the ovarian cyst can be done by trans-rectal palpation, ultrasonography and estimation of progesterone hormone. Among the above methods ultrasonography could be used for

characterizing the morphology of the cystic ovary, whereas progesterone concentration would be helpful to determine the degree of luteinization of cyst. Number of hormonal and non-hormonal approaches have been adopted to treat the follicular cyst by various researchers.

Type of ovarian cyst:

A) Pathological ovarian cyst- Anovulatory cyst

1. Follicular cyst-Thinner walled and the wall is tense and distended. The cyst has pale yellow colour fluid within a, smooth convex outer surface. The ovulation does not occur in follicular cyst.
2. Luteal cyst-Thicker walled; inside the cyst amber or dark yellow or brown colour fluid will be present. The outer surface is smooth and convex. The ovulation does not occur in follicular cyst.

B) Non-pathological ovarian cyst- Ovulatory cyst

1. Cystic corpora lutea (Cavitary CL)- Usually develops following a normal ovulation, but contain a fluid filled cavity from 5 mm to 7-10 mm or more in diameter

Different opinion on follicular cyst

1. Persistent follicles >20 mm in diameter are referred as “cystic” (McNutt had first used the term cyst)
2. Fluid filled or hard structures of 2.5 cm or more in diameter persisting on the ovarian surface for 10 days or more even in the absence of corpus luteum (Youngquist and Threlfall, 2007).
3. Consequence of a dominant follicle that fails to ovulate at the appointed time of ovulation (12-16 hrs after the end of estrus) during the estrous cycle (Peter, 2004).
4. Follicles generally ovulates while reaching 13-17 mm diameter. Follicles that persist without ovulation at this diameter or greater may be named as cystic (Hatler *et al*., 2003).
5. Anovulatory follicles with <20mm on one or both ovaries that fails to regress yet maintain growth and steroidogenesis and interfere with normal ovarian cyclicity even in the absence of corpus luteum (Vanholder *et al*., 2006).
6. Multiple follicles that are typically larger than normal ovulatory follicles with an increased overall ovarian diameter along with a flaccid uterus in the absence of a corpus luteum is considered to be follicular cyst (Purohit, 2008).
7. Follicle like fluid filled cavity, with a diameter of more than 17 mm and persisting for more than six days on the one or both the ovarian surface in the absence of a functional corpus luteum and obviously interfering with normal ovarian cyclicity in dairy cow (Silvia *et al*., 2002).

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17/01/2025

Fate of ovarian follicular cyst

1. Cysts may remain dominant for a prolonged period without other follicular growth
2. Cysts may lose dominance and be replaced by a cyst from a new follicular wave (cyst turnover)
3. Cysts may lose dominance and a new dominant follicle may develop and ovulate (Cook *et al*., 1990).

Diagnosis

Diagnostic methods for ovarian cyst include owner history, clinical signs, rectal examination, ultrasonography and progesterone assay (Table 1).

Table 1: Diagnostic methods for ovarian cyst in dairy cows and buffaloes

S.No.	Diagnostic methods	Criterion for diagnosis of ovarian cyst
1	History and clinical signs	Nymphomania, bull-like appearance, relaxation or stretching of the sacro-sciatic ligaments resulted in raised tail head appearance (upward displacement of coccygeal- ***Sterility hump***), excessive mounting, bellowing, erratic milk production
2	Rectal examination	Tonic uterine horns with increased overall size of the ovary due to soft/thin fluctuating large sized follicle on surface of the any one or both the ovaries, whereas luteinized follicle palpated as thick structure on the ovary. But, accuracy of diagnosing the cystic condition by rectal palpation depends on the experience and differentiating between cysts is difficult.
3	Ultrasonography	Ultrasonography is effective in differentiating follicular and luteal cysts with high accuracy by measuring the diameter of follicular wall thickness and follicular fluid. An uninterrupted anechoic antrum with a relatively smooth, thin wall and little or no echogenic patches in follicular cyst **Follicular wall thickness** ✓ Follicular wall thickness less than 3 mm- *Follicular cyst* ✓ Follicular wall thickness more than 3 mm- *Luteal cyst* **Content of follicular fluid** ✓ Clear anechoic fluid- **Follicular cyst** ✓ Fibrin like strands (Cob-web like)- **Luteal cyst**

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17/01/2025

4	Progesterone assay	Progesterone concentration in plasma and milk could be used to describe the degree of luteinization of follicle. **Plasma:** ✓ Less than 1 ng/ml of P_4 concentration- ***Follicular cyst*** ✓ More than 1 ng/ml of P_4 concentration- ***Luteal cyst*** **Milk:** ✓ Less than 2 ng/ml of P_4 concentration- ***Follicular cyst*** ✓ More than 2 ng/ml of P_4 concentration- ***Luteal cyst***

Treatment approach

Various number of endocrine based treatment (hormonal) and non-hormonal approaches were tried by researchers and obtained good result in some cases, but not in all cases. It might be due to disturbances in endocrinology and uterine physiology following persistence of cystic condition for long time. Treatment of ovarian cyst in dairy cow is influenced by the cost and the expected treatment benefit, the cost of replacement, and the breeding value of the animal. In olden days manual rupture of the non-responsive cyst through rectum was practiced. Currently manual rupture of follicular cyst is not advised due to potential danger of internal haemorrhage and peri-ovarian adhesion which might follow manual rupture of follicular cyst (Purohit, 2008). Hence, new technique required to treat the non-responsive follicular cyst at field level. The name of the technique is trans-gluteal aspiration/evacuation non-responsive follicular cyst.

Trans-gluteal approach for follicular cyst aspiration

Principle

Trans-gluteal aspiration of follicular cyst involved point rupture on the individual follicle (persist over a period of time) through long needle from gluteal region followed by aspiration.

Application

1. Retrieve the eggs (oocytes) from follicles for *in vitro* fertilization
2. Treating non-responsive follicular cyst
3. Treating para-ovarian cyst

Materials required for trans-gluteal aspiration of follicular fluid

1. Full hand plastic AI gloves
2. Lubrication (soap, liquid paraffin)
3. Shaving blade for clip the hair on the mid-gluteal region
4. Povidone iodine- maintain asepsis on the mid-gluteal region

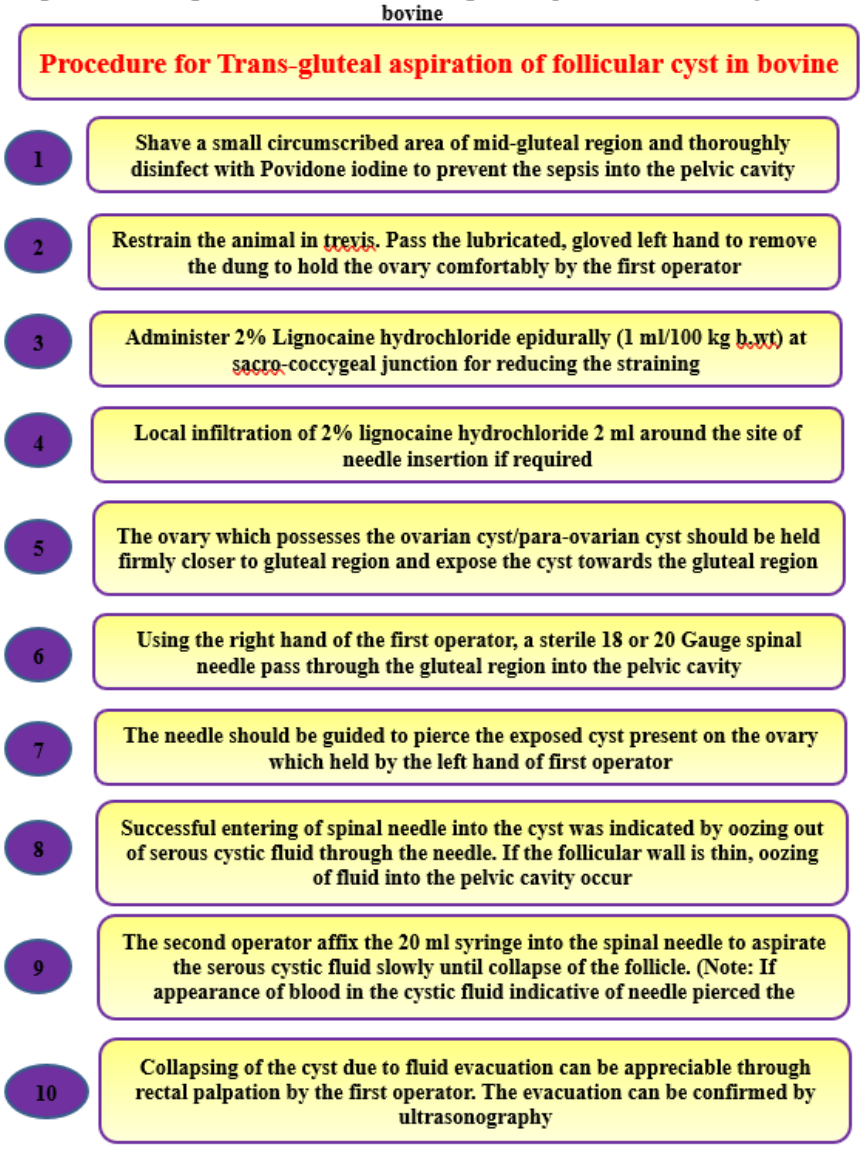
Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17/01/2025

5. 18 G/20 G needle for administration of epidural anaesthesia
6. 2% lignocaine hydrochloride
7. 18 G (0.9 mm × 90 mm) spinal needle for trans-gluteal aspiration
8. 20 ml sterile syringe

Procedure

Trans-gluteal aspiration of a follicular cyst refers to a procedure where a fluid-filled sac (follicular cyst) is aspirated (drained) from the respective ovary using a spinal needle inserted through the mid-gluteus, accessing the ovarian follicle via the gluteal region with or without ultrasound guidance. Brief description of procedure for "trans-gluteal aspiration of a follicular cyst" depicted in **Figure 1 and Figure 2** for easy understanding the technique to adopt in the field level to treat the follicular cyst.

Figure 1: Flow diagram of Procedure for Trans-gluteal aspiration of follicular cyst in bovine



Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17/01/2025

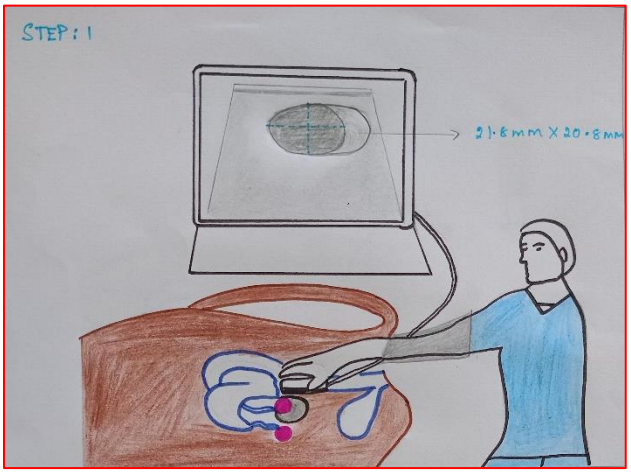
Advantage of trans-gluteal aspiration technique

1. A viable option if hormonal therapy is nor responding or not financially feasible.
2. Degree of damage to the ovarian stroma and adjacent structures is very less as compared to manual rupture of follicle.
3. Costlier of sophisticated equipment's is not required as in the case of trans-vaginal ultrasound guided needle aspiration set or ovum pick up unit.
4. Easy to perform anywhere in the field such as Veterinary dispensary, hospitals and doorsteps of farmer house
5. Less costly
6. Less time consuming

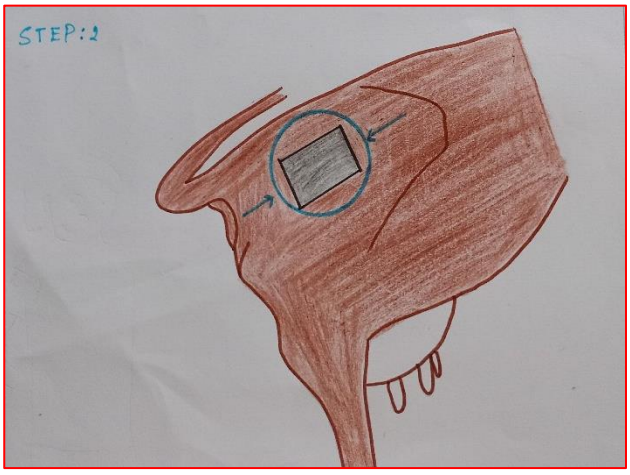
Conclusion:

Follicular cyst is the most common form of ovarian cyst in dairy cattle and buffalo, which could be diagnosed rectally and could be confirmed by ultrasonography. Number of hormonal protocols tried by researchers which showed variety of responses. Non-responsive follicular cyst was addressed by a novel, minimal, non-invasive technique called "trans-gluteal aspiration of a follicular cyst".

Figure 2: Procedure for follicular cyst aspiration by trans-gluteal approach (Sketch diagram)

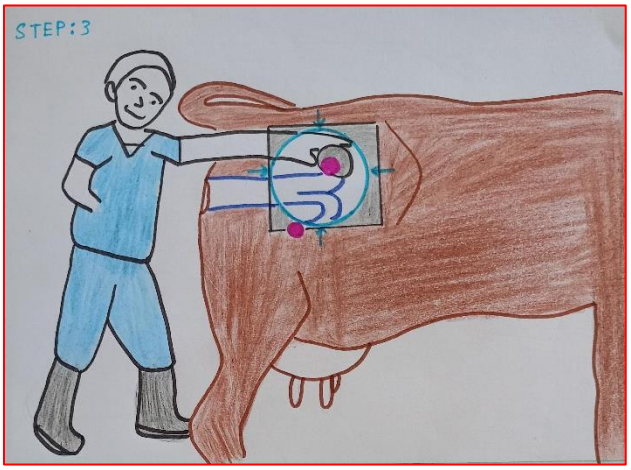


Step 1: Ultrasonographic examination of follicular cyst

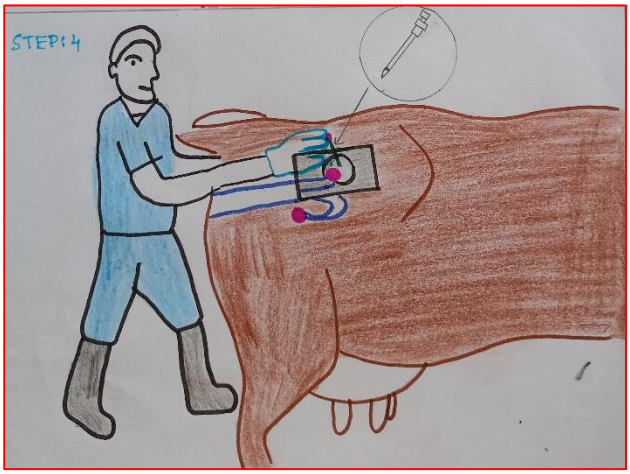


Step 2: Preparation of mid-gluteal region

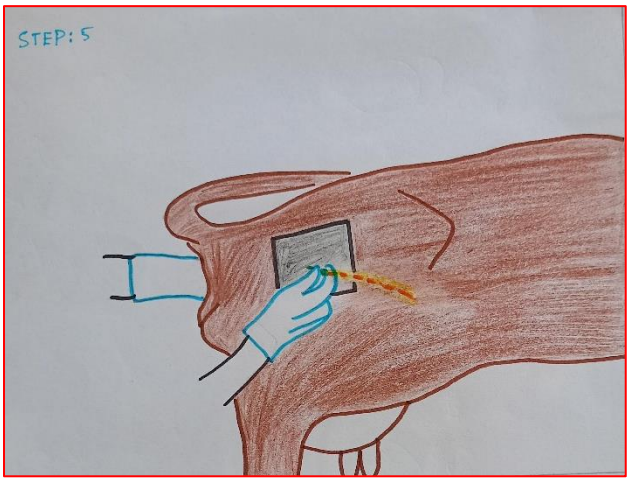
Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17/01/2025



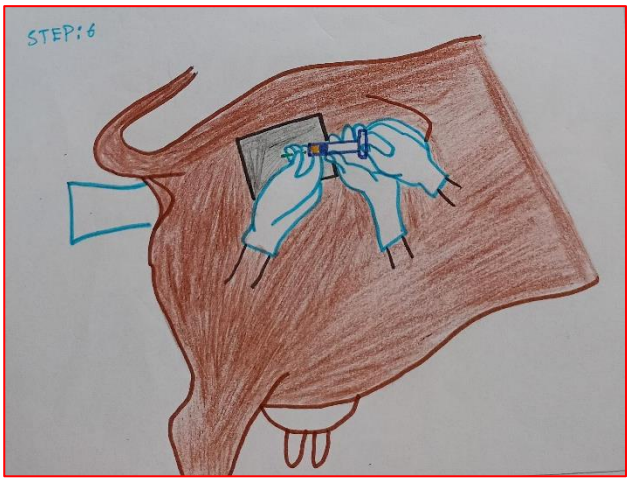
Step 3: Bring the follicular cyst affected ovary to the aseptically prepared mid-gluteal region after epidural anaesthesia



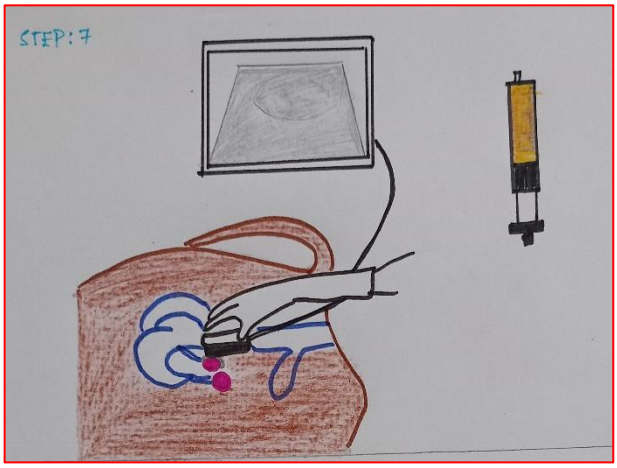
Step 4: Insertion of 18 G spinal needle by the right hand of first operator through mid-gluteal region to the pelvic cavity to reach the cystic ovary in the left hand



Step 5: Exact piercing of the cystic ovary is confirmed by oozing of fluid through the hub of the spinal needle



Step 6: Aspirate the cystic fluid by fixing the 20 ml syringe on the spinal needle



Step 7: Ultrasonographic examination of collapsed cystic follicle after aspiration/evacuation

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17/01/2025

References:

Cook DL, Smith CA, Parfet JR, Youngquist RS, Brown EM, Garverick HA. 1990. Fate and turnover rate of ovarian follicular cysts in dairy cattle. J Reprod Fertil, 90:37-46.

Hatler TB, Hayes SH, Fonseca LFL, Silvia WJ. 2003. Relationship between endogenous progesterone and follicular dynamics in lactating dairy cows with ovarian follicular cysts. Biol Reprod, 69:218-223.

Peter AT. 2004. An update on cystic ovarian degeneration in cattle. Reprod Domest Anim, 39:1-7.

Purohit GN. 2008. Recent developments in the diagnosis and therapy of repeat breeding cows and buffaloes. CAB Rev: Perspect Agric Vet Sci, Nutr Nat Res, 3(62):1-34.

Silvia WJ, Hatler TB, Nugent AM, . 2002. Ovarian follicular cysts in dairy cows: an abnormality in folliculogenesis. Domest Anim Endocrinol, 23:167-177.

Vanholder T, Opsomer G, de Kruif A. 2006. Aetiology and pathogenesis of cystic ovarian follicles in dairy cattle: a review. Reprod Nutr Dev, 46:105-119.

Youngquist RS, Threlfall WR. 2007. Ovarian follicular cysts. In: Youngquist RS, Threlfall WR (Ed.). Current Therapy in Large Animal Theriogenology. St. Louis, MO: Saunders Elsevier. pp. 379-383.