

# Ovarian Cyst: Ultrasound approach, part 2

## Diagnosis of Ovarian Cyst: Confront between palpation & Ultrasonography

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Accuracy of diagnosis is crucial. According to Ginther (1998) if the diagnosis is made manually by rectal exploration, the margin of error for the diagnosis of ovarian cyst is very high (Table 2).

When the diagnosis of an ovarian cyst is made by ultrasound, according to Ginther (1998), the margin of error is much smaller (Table 3).

In most cases cystic cows suffer from prolonged periods of anestrus (Anestrus type II and type III): 90 % of cystic ovary degeneration cows do not cycle. Nymphomania with prolonged periods of persistent and frequent oestrus is observed in very rear cases of cystic cows.

### Therapy

What is the goal of the buiatrist gynecologist? To treat a symptom or to impregnate cows?

When dealing with the subject of ovarian cysts, answering this question is as necessary as ever. Most of the proposed therapies aim either at luteinization of the cyst and/or resumption of normal ovarian cyclicity. But our goal should be to impregnate cows as soon as possible.

### GnRH

Three possible scenarios, depending on the depth of the negative energy balance:

1. A dose of GnRH is administered and absolutely nothing happens.
2. One dose of GnRH is administered, and two doses later there should be a peak of LH, which could lead to luteinization of the follicular cyst. The resulting increase in progesterone lasts 15-18 days and allows the normal hypothalamic-pituitary-ovarian axis to be restored and normal cyclicity to resume in most cows. In fact, about 18-20 days after administration, this luteinized structure generally undergoes spontaneous luteolysis, followed by a normal estrous cycle. The interval between GnRH administration and the cows coming into oestrus can be shortened with the use of prostaglandins administered 7-10 days after GnRH treatment (Smith 2015).
3. A dose of GnRH is administered which de facto causes ovulation of a dominant follicle present. In this situ-



*In cystic cows that are constantly in oestrus, there is also relaxation of the sacro-ischial ligaments. The vulva is constantly oedematous and hyperemic.*

ation, ovulation occurs, and the start of a new follicular wave followed by a normal luteal phase.

### hCG

Exploiting the LH effect of this glycol-protein, an attempt is made to luteinize the cystic follicle, and a prostaglandin is then administered to induce regression of the luteinized cystic structure and initiate a new wave of follicular growth. It has been shown that in some cases the administration of this hormone leads to the production of antibodies to the hormone itself, hence the reduction or suppression of its effect with repeated treatment.

### Progesterone

Cows with follicular cysts basically need

Method	Follicular Cyst	Luteal Cyst
Palpation	35 %	57 %

*Table 2. Margin of error diagnosis of ovarian cyst (luteal and follicular) made manually by transrectal palpation of the ovaries.*

Method	Follicular Cyst	Luteal Cyst
Ultrasonography	18 %	13 %

*Table 3. Margin of error diagnosis of ovarian cyst (luteal and follicular) by ultrasound through transrectal palpation of the ovaries.*

progesterone. For this reason, the authors are firmly convinced that the use of intra-vaginal devices is the most convenient choice in the case of type I cysts. The success of this approach, however, is dependent on the energy balance of the cow: If the cow is still with a very deep BEN, i.e., with a high milk production, it is natural to expect that the hepatic catabolism of even this exogenous progesterone will be accelerated. The 90 mg of progesterone released daily by these devices are therefore insufficient. There are therefore two possibilities: Wait until the cow's production decreases, or increase the availability of progesterone, which is not possible today.

The mechanism of action of these devices is simple: the progesterone released by the device increases the level of circulating progesterone to a level comparable to that present in the luteal phase of a normal cycle. This high level of progesterone induces atresia of the cyst follicles by lowering the frequency of LH pulses (which is high in the case of estrogen-active cysts). This eliminates the positive feedback from estrogen and thus the inhibitory effect of inhibin on FSH. A new wave of follicular growth can then begin. Among other things, the presence of progesterone causes LH pulsatility to be minimal, so indirectly the growth of the new dominant follicle is controlled (Smith 2015).

#### P4/GPG

Classical Ovsynch can be used in cattle with ovarian cysts, but it guarantees only very modest results. To improve the conception rate, it is far more advantageous to use an Ovsynch and an intra-vaginal device. The introduction of the intra-vaginal device significantly increases the conception rate. However, it should be remembered that the rate of late embryonic death (30-60 days gestation) in these animals that are pregnant is with a history of cystic degeneration of the ovaries 2-3 points higher than in cows that have not had this problem.

#### Double Ovsynch®

Double Ovsynch® is an excellent therapy for animals with follicular cysts and has the great advantage of ending with the fixed time insemination of these

cows. In breeding farms where this pre-synchronization is already used, it makes it possible to include in the program also cows with ovarian cysts, i.e., without a corpus luteum, already at the end of the voluntary waiting time of the breeding farm, inseminating these problematic cows 27 days after the administration of the first GnRH. This is an excellent solution for those herds that for internal reasons do not want to use slow-release intra-vaginal progesterone devices.

#### To break the cyst or not to break the cyst

Is it necessary to rupture the cyst, i.e., cause it to crush, transrectally? No, it is not necessary and above all it is not good for the cow. If you want to drain a cyst because its size is deemed excessive, you can use other methods such as mechanical drainage.

Sometimes it happens during a gynecological examination, even ultrasound, that a cyst on an ovary spontaneously ruptures with the slightest pressure. In these cases, no damage is done to the ovary. It is a different matter when great pressure is exerted manually, to determine the rupture of the ovarian cyst.

Let us say first of all that the rupture or drainage of the luteal cyst must never be done. Regarding the need to drain or rupture a follicular cyst, it depends on its size. In the presence of cysts with a large diameter > 50 mm, it may be necessary to intervene, in order to limit the pain that these structures can cause. Ovarian cyst colic has not been described in cattle, as it has been described in women and horses, and there is only one reason for this: cattle are more pain tolerant than other mammal species. However, in the presence of large cysts, the cow feels pain and consequently there is a large release of natural opioids such as endorphins and enkephalins. These substances cause hypothalamic GnRH not to be released, blocking the calcium channels. The removal of a large cyst therefore has its reasons. The problem is how the large cyst is removed: whether by crushing is not good, because of the many problems that crushing causes. In some cases, the pressure that must be exerted to rupture the ovarian cyst is such that it produces a lot of pain in the cow, who re-



*The manual rupture of ovarian cysts can lead to the formation of adhesions, which in some cases can lead to infertility.*

sponds by kicking the technician who is trying to rupture the cyst. Manual rupture of the cyst can lead to haemorrhages, which in some cases can be fatal, but can always lead to the formation of adhesions with the ovarian bursa, which in the case of the salpinx can be the reason for a condition of hypo-fertility or infertility.

In other cases, extreme manipulation of the ovaries leads to inflammation of the ovaries, which again results in the formation of adhesions. If a cyst must be drained because of its size, it is best to do so mechanically, unless the cyst has such a thin wall that slight pressure causes it to rupture. This never happens in the case of old follicular cysts, as these structures have an internal scaffolding with connective tissue partitions of several millimeters, which make them particularly resistant to external pressure.

A cyst suction gun is used for mechanical removal of the cyst. The cyst can be aspirated with a rectal echo-guide, with a 5.0-10.0 MHz linear or curved ultrasound probe, or even with the same device used for oocyte aspiration (7.5 MHz micro-convex probe with aspiration system, used trans-vaginally). For this operation, it is best to put the cow in the arla (for protection of the cow and the technician), although the operation is also commonly performed with the cow standing in the feeding lane.

Most cows do not require sedation. Epidural anaesthesia is performed with 5-6 ml of procaine 2 %, after proper preparation of the anaesthetic inoculation site. Approximately 10 minutes after administration of procaine, the rectum is emptied, the perineal region of the cow is washed, dried and disinfected, and the vagina is cleaned.

The cyst suction gun is inserted into a rectal examination glove and the glove is lubricated with obstetric gel to facilitate vaginal gliding. The instrument is pushed into the right or left vaginal fornix depending on the position of the cyst. The hand in the rectum pushes the cystic ovary into the device and when the gun and the cyst are matched, the trigger of the gun is pulled, causing the needle (18G) to come out and penetrate the cyst cavity, piercing the fornix.

The cyst can be simply drained (in which case help is given to aspirate the liquid using the syringe attached to the gun), or the cyst can be ruptured by holding the needle firmly inside the cyst cavity and moving the cyst with the hand into the rectum. The rupture of the cyst results in the rupture of the basement membrane, which is still present, albeit in places, in the follicular cyst. The basement membrane is the only vascularized part of the cyst, so its rupture causes micro haemorrhage within the cyst cavity (something very similar to what happens with Graf follicle rupture). This micro haemorrhage is an excellent substrate for the future formation of a corpus luteum, the formation of which can be accelerated by the placement of an intra vaginal slow-release progesterone device for seven days.

Once the cyst has been drained, the device is removed from the vagina. The single-use needle is removed, and the device is washed and disinfected.

## Conclusions

Based on current knowledge, it is possible to conclude that the definition of ovarian cysts should be substantially revised: the diameter of the cyst has a very relative value and indeed smaller ovarian cysts, being correlated with a deeper BEN, have a more reserved prognosis.

Since cysts are »flexible« structures, the concept of persistence is also of relative value: particularly for small cysts



*Drainage of the follicular cyst, if necessary, should be done with a cyst suction gun.*

(anaestrus type II), the cyst structures can be renewed over the course of 10 days.

The absence of a CL is clinically decisive: 30 % of ovarian cysts are concomitant with a CL and therefore should not be considered pathological.

The classification into follicular cyst and luteal cyst is of clinical and therapeutic value. There is only one type of cyst, the follicular cyst, which luteinizes more or less early and turns into a luteal cyst.

Rather than being interested in the treatment of the cyst, we should have as our objective: to get pregnant the cow. ♦

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