



BILATERAL POLYCYSTIC OVARY IN A NELLORE COW: CASE REPORT

CASE REPORT

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ABSTRACT

The most common ovarian disease in cattle is follicular cyst, but there are few studies addressing this problem in zebu cows on pasture. In humans, this condition is known as polycystic ovary syndrome (PCOS). The aim of this study is to report on the occurrence of polycystic ovary syndrome in a multivariate Nellore cow kept on pasture. The case was detected during an ultrasound examination of the reproductive tract at the beginning of the breeding season. The cow in question was approximately 60 days postpartum and rectal palpation revealed bilateral ovarian enlargement. Ultrasound examination revealed a low-echo lobular image suggestive of multiple follicles. Without treatment, the cow was slaughtered and her reproductive tract removed for macroscopic, morphometric and histopathologic analysis. The ovaries were found to contain a large number of cystic formations of varying sizes, confirming the diagnosis of polycystic ovary syndrome. Although PCOS is well documented in humans, it has not yet been described in female cattle. This report is novel in that cows kept on pasture and fed only mineral salt rarely show ovarian pathologies. It can therefore serve as a guide for professionals in the field who are aware of the possible occurrence of this case.

Keyword: Ovarian pathology, Zebu cattle, Follicular cyst.



1. INTRODUCTION

Among the diseases of the ovaries, the follicular cyst is the most common in female cattle. It is characterized by the presence of a fluid-filled structure in the ovaries for at least ten days with a diameter of more than 2.5 cm, which for some reason does not induce ovulation and thus prevents the normal cyclicity of the female^{1,2}.

This condition is more frequent in dairy cows because they are fed a nutrient-rich diet³. Zebu cattle have a lower incidence of follicular cysts². In humans, this disorder is known as polycystic ovary syndrome (PCOS)⁴. Like women, cattle are monovulatory, i.e. they usually have only one dominant follicle that releases a single oocyte in response to LH⁵.

The aim of this study is to report on the occurrence of polycystic ovaries in a multiparous Nellore cow kept on pasture.

2. CASE HISTORY

The case occurred at the UNOESTE experimental farm in the municipality of Presidente Bernardes, São Paulo, Brazil, at 22° 28' 25" S, 51° 67' 88" W and an altitude of 400 meters. The climate is tropical, with an average annual temperature between 15°C and 32°C. Diagnosis of the cows' reproductive tract was carried out using ultrasound before the start of the breeding season. The cows are kept in the *Panicum maximum* cv. *Tanzânia* pasture with free access to water and mineral salt.

The gynecological examination was carried out in January 2022 on a 4-year-old perennial Nellore cow. The interval between calvings of the last pregnancy was 352 days, with the first calving on 10.09.2020 and the second on 26.09.2021. At the time of discovery of the ovarian abnormality, the cow was approximately 120 days postpartum.

Rectal palpation revealed bilateral ovarian enlargement, and ultrasonography (Honda model HS-2000VET with a 7.5 MHz transrectal transducer) revealed a lobular, anechoic image suggestive of multiple follicles greater than 7 mm in size (Figure 1).



Thirty days later, a follow-up ultrasound was performed, which showed that the ovarian condition was unchanged, with the presence of multiple follicles (Figure 2). No treatment was carried out and the decision was made to slaughter the cow. In June, the cow was slaughtered and the reproductive tract was removed immediately after slaughter and sent to the pathology laboratory for macroscopic analysis, morphometry and preparation of samples for histopathological examination.

After macroscopic evaluation with photo documentation (Figure 3), the right and left ovaries were weighed and measured and the length and width of the right and left uterine horns were recorded (Table 1). Longitudinal sectioning of the ovaries with a scalpel revealed a small hematoma-like area in the left ovary and a corpus luteum in the right ovary (Figure 4).

The ovarian samples were fixed in 10 % buffered formalin and subjected to a standard histological examination. Histopathologic examination revealed that the right and left ovaries had a large number of cystic formations of different sizes, with walls composed of follicular epithelium and secretory contents ranging from pink to amphophilic and diffusely distributed in the cortical and medullary regions (Figure 5).

The endometrium was also examined histopathological and showed no significant pathological changes (Figure 6). The final diagnosis was polycystic ovary syndrome.

3. DISCUSSION

This appears to be the first reported case of polycystic ovaries in a young Nelore cow kept exclusively on pasture and for which there are no predisposing factors. Cystic ovarian disease in cattle is well documented and relatively common. However, unlike the case presented here, it usually involves one or a few follicles that exceed the breed-typical ovulation diameter. We have classified our finding as a polycystic ovary because the morphologic and ultrasonographic features are similar to polycystic ovary syndrome (PCOS) in humans. PCOS is well described and studied in humans, but there are no reports of it in female cattle, especially in zebu breeds.

The first significant finding in this case was the marked bilateral enlargement of the ovaries on rectal palpation. In a study of ovaries of Zebu cattle obtained from



slaughterhouses, the right ovary measured 2.73 cm, 2.04 cm and 1.71 cm and the left ovary measured 2.67 cm, 1.94 cm and 1.70 cm in terms of length, width and thickness, respectively. These measurements were larger ($p < 0.05$) when a corpus luteum (CL) was present⁶. The polycystic right ovary in this case did not show the same increase in size due to the presence of a corpus luteum, as it was already abnormally large. In a recent study in which the CL was monitored from ovulation to luteolysis in non-pregnant and non-supplemented Nellore heifers, the CL reached a maximum diameter of 1.93 cm on day 12 of the estrus cycle⁷. In the present case, the CL was measured at 1.78 cm during an unknown phase of the estrous cycle, which is within the normal range. In humans, according to the Rotterdam⁸ criteria for PCOS, pelvic ultrasound shows at least 12 follicles in each ovary ranging in size from 0.2 to 0.9 cm and/or an increase in ovarian volume without the presence of a dominant follicle or corpus luteum.

Follicular cysts in cattle typically occur during the first postpartum cycle and are associated with anoestrus, potentially recurring over several consecutive cycles and leading to economic losses^{9, 10}. It has been reported that in dairy cattle breeds, the most common symptom of cysts is anoestrus, with disease incidence being highest up to 90 days after parturition³. In the present study, the zebu beef cow was approximately 120 days postpartum, had multiple cysts and was pregnant due to the presence of a CL.

A histologic examination of the endometrium was performed because it showed hypertrophy macroscopically; however, no significant pathologic changes were found. Other ovarian pathologies can also occur in female cattle, e.g. granulosa cell tumor, abscesses, dermoid cysts, teratomas and rete ovarii metaplasia², so histopathologic examination is required for a reliable diagnosis .

This case report is a novelty as cows kept on pasture, fed only mineral salt and young rarely present ovarian pathologies, especially polycystic ovary disease, the occurrence of which has not been documented in cows. This finding in a routine ultrasound examination serves as a guideline for professionals in the field regarding the possible occurrence of this type of cystic disease in female Zebu cattle.



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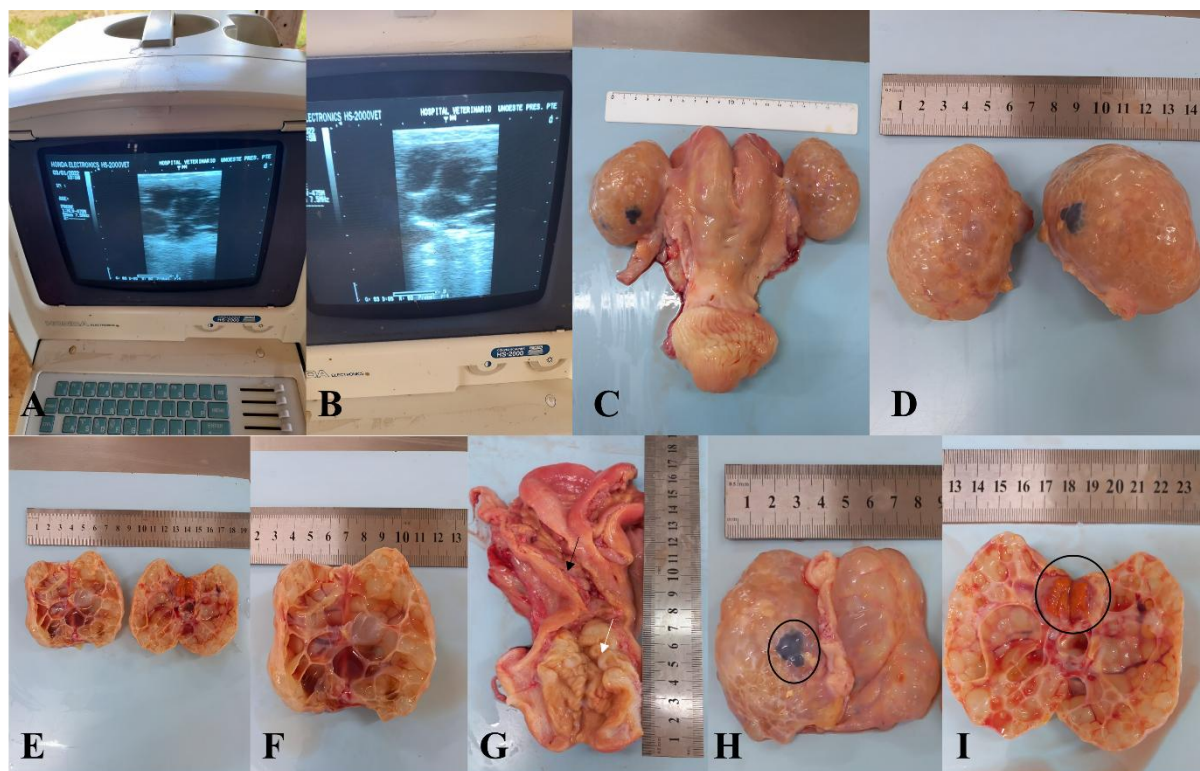
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Table 1. Morphometry of ovaries and uterine horn of Nellore cow with polycystic ovary

Ovary	Height	Length	Width	Weight
Right	3,4 cm	7,1 cm	4,0 cm	82,54 g
Left	4,5 cm	7,4 cm	4,7 cm	108,91 g
Uterine Horn		Length	Width	
Right	-	30,1 cm	2,0 cm	-
Left	-	35,5 cm	2,8 cm	-

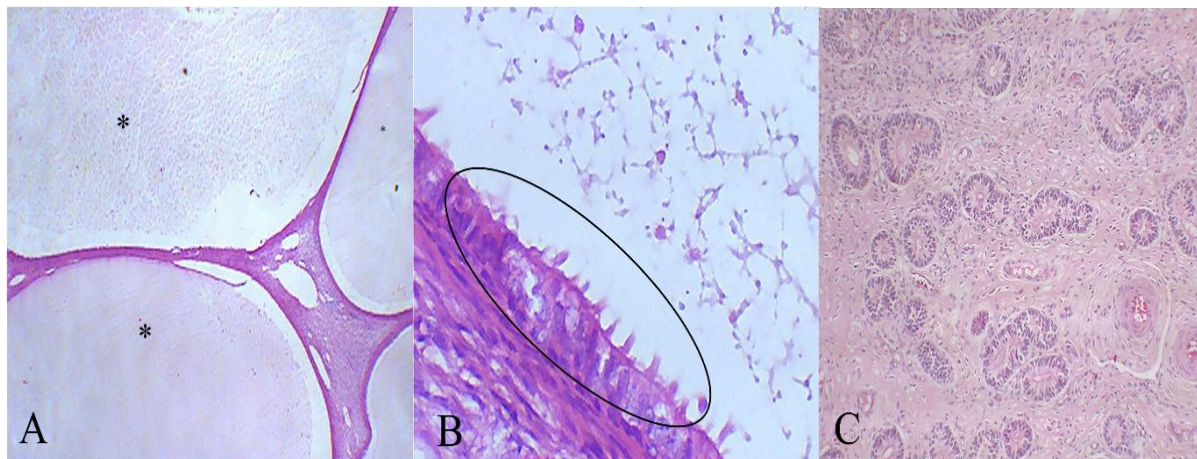
Source: Authors, 2024.

Figure 1. A - Ultrasound in January 2022. B - Ultrasound in February 2022; C - Whole ovaries along with the uterus; D - Whole ovaries. E – Sectioned ovaries; F - Sectioned left ovary of a Nellore cow with polycystic ovary; G - Endometrium (black arrow) and cervix (white arrow); H - Left ovary with a hematoma. I - Right ovary with the presence of a corpus luteum, obtained from a Nellore cow with polycystic ovary



Source: Authors, 2024.

Figure 2. Histological photomicrograph of the ovaries of a Nelore cow with polycystic ovary. A - Extensive cystic formations, follicles with amorphous amphophilic secretory material (*). H&E stain, 10x objective. B - Highlighted follicular epithelium. H&E stain, 40x objective. C - Absence of significant pathological alterations in the endometrium. H&E stain, 10x objective



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