Spontaneous Repair of the Atrophic Contralateral Ovary without Ovariectomy in the Case of a Granulosa Theca Cell Tumor (GTCT) Affected Mare

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ABSTRACT. A 21 year old thoroughbred mare with granulosa theca cell tumor (GTCT) in the right side and atrophic contralateral ovary was investigated in this study. After arrival at our laboratory on 10th December 1999, the clinical diagnosis of GTCT was examined by rectal palpation and ultrasonographic image of ovaries. Plasma from peripheral blood was collected in the breeding and non-breeding seasons for hormonal analysis. The results showed that the contralateral ovary regained normal activity without any treatment of the GTCT affected ovary and contained follicles showing different sizes 19 months later. However, the affected right ovary, which became smaller after 4 months, was totally inactive without any follicle. The observations clearly demonstrate that without any treatment of the GTCT affected ovary, a mare can return to her normal estrous cycle within a certain period in some GTCT cases.

KEY WORDS: contralateral ovary, granulosa theca cell tumor, mare.

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The granulosa theca cell tumor (GTCT) results in the destruction of the affected ovary, rendering it nonfunctional and is often associated with complete atrophy of the contralateral ovary [1, 3, 4]. Therefore surgical removal of the affected ovary results in the reestablishment of normal estrous cycle by repair of the contralateral ovary in most mares [5, 6].

Recently we found a very interesting case during the investigation of GTCT in mares. In this case the GTCT affected mare recovered her normal estrous cycle without any surgery. That is, without ovariectomy, the GTCT affected mare returned to her normal estrous cycle. There are no reports of a contralateral ovary repairing spontaneously.

The mare was 21 years old and had parity of 7. Her last parturition was on 18th April 1999. After her parturition she showed a normal estrus. After normal estrus she conceived after one mating on 28th May, 1999, but unfortunately she had a miscarriage on 2nd September 1999. After abortion this mare showed stallion like behavior. At this time, a veterinarian found GTCT with honeycomb appearance in her right ovary and an atrophic contralateral left ovary by ultrasonographic examination. This mare came to our laboratory on 10th December 1999 for final diagnosis.

Upon arrival at our laboratory, the right ovary was found to have enlarged and contained many large, medium and small follicles, but the contralateral left ovary was observed to be small and atrophied by rectal palpation and ultrasonographic examination (Fig. 1a). From these findings, the diagnosis of GTCT was confirmed. The affected ovary was approx. 18.0 × 13.0 × 9.0 cm in size, and the size of the contralateral ovary was approx. 3.4 × 2.5 × 1.8 cm.

During Dec. 1999 and Jan. 2000 peripheral blood analysis showed very low concentrations of follicle stimulating hormone (FSH) (0.05 ± 0.02 ng/ml), lutenizing hormone (LH) (6.12 ± 0.08 ng/ml), immunoreactive-inhibin (ir-INH) (508.12 ± 99.39 pg/ml), progesterone (P) (27.26 ± 3.29 pg/ml) and estradiol-17 β (E₂) (2.78 ± 1.15 pg/ml) levels, and an elevated level of testosterone (T) (594.57 ± 223.12 pg/ml) accompanying the GTCT condition.

One month after the ultrasonographic examination at our laboratory the affected right ovary became smaller and all follicles became degenerated. The left ovary remained small and inactive (Fig. 1b), and the mare showed a complete anestrus condition for about 19 months.

During the anestrus condition (from January 2000 to April 2001), the concentrations of FSH (3.03 ± 0.28 ng/ml), LH (0.12 ± 0.04 ng/ml), ir-INH (92.99 ± 5.48 pg/ml), P (5.15 ± 0.8 pg/ml) and E₂ (0.73 ± 0.13 pg/ml) levels were low in peripheral blood, while an elevated level of T (101.06 ± 4.12 pg/ml) was shown.

Ovariectomy is the logical treatment for GTCT and there is a reasonable prognosis for a resumption of ovulatory estrous cycles within two years after removal of the affected ovary [6]. However the case we report was very interesting because without ovariectomy the contralateral ovary became active after approximately 19 months (Fig. 1c) and the mare showed a normal estrous cycle in the breeding season of 2001. Reproductive evaluation on April 2001 revealed that the right ovary was inactive, whereas the left ovary had become normal in size and numerous follicles were present. The mare showed estrus on 12th April 2001 and ovulated on 4th May 2001. The 2nd estrus showed on 20th May 2001 and ovulation occurred again on 27th May

Fig. 1. Ultrasonographic picture of ovaries from 10th December 1999 to 10th April 2001. a. The affected right ovary and the inactive contralateral left ovary on 10th December 1999. Note the size of the organ, its multicystic architecture with large, medium and small follicles (F) in the right ovary and the inactive contralateral left ovary. b. The affected right ovary without any follicle and the inactive contralateral left ovary on 10th January 2000. c. The atrophied right ovary and the functional contralateral left ovary with some follicles (F) on 10th April 2001.

2001. The final estrus of the breeding season was on 11th June 2001 with ovulation on 15th June 2001. Thus, the mare had returned to her regular estrous cycle of about 23 days duration.

After returning to a normal estrous cycle, plasma concen-

trations of FSH, LH, ir-INH, P, E_2 and T reverted to normal levels according to the appearance of proestrus, estrus, metestrus and diestrus (Fig. 2).

Occasionally we have received anecdotal information from other veterinarians regarding their clinical experience

Fig. 2. Changes of plasma concentrations of follicular stimulating hormone (FSH), luteinizing hormone (LH), ir-inhibin (ir-INH), estradiol-17 β (E₂), progesterone (P) and testosterone (T) levels after restoration of a normal estrous cycle in 2001.

that some GTCT mares spontaneously repaired, but there are no reports about these cases.

It is not clear whether or not our GTCT affected mare is a rare case, because almost all GTCT affected mares receive surgical intervention for recovery of fertility after the finding of GTCT [5, 6]. It is also not clear why the contralateral ovary became active after such a long time in this case, because the actual cause of the atrophic contralateral ovary is not known. But after the disappearance of abnormal follicles from the affected right ovary, which secreted abnormal hormones, it seems that the contralateral left ovary might have been released from an abnormal hormonal environment. So, in our interesting case, due to the absence of the abnormal hormonal environment for a long time, the contralateral left ovary may have become active in the breeding season similar to the contralateral ovary becoming active 6 months to 1 year after removal of a GTCT affected ovary in some cases [2].

According to this result it seems that it may be not necessary to remove a GTCT affected ovary in order to restore a normal estrous cycle in some cases.

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