DIAGNÓSTICO E TRATAMENTO DE UM LEIOMIOSSARCOMA PERIOVÁRICO DE GRANDES DIMENSÕES NUMA CADELA

DIAGNOSIS AND TREATMENT OF A LARGE PERIOVARIAN LEIOMYOSARCOMA IN A FEMALE DOG

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Resumo: *Os leiomiossarcomas periováricos em cadelas são patologias raras e geralmente de mau prognóstico. Apresentamos o caso de um canídeo, fêmea inteira com 10 anos de idade. A cadela compareceu à consulta por desconforto abdominal, prostração e anorexia de aparecimento agudo. Foram realizadas radiografias abdominais e AFAST nos quais se observou um efeito de massa. Realizou-se uma laparotomia exploratória, em que se observou uma massa de grandes dimensões (15 cm x 20 cm) na região ovárica direita. Procedeu-se à ovariohisterectomia total com exérese da massa, que parecia envolver o ovário direito. O exame histopatológico mostrou tratar-se de um leiomiossarcoma localizado nos tecidos periováricos, de grandes dimensões, sem comprometimento do ovário. Na literatura não encontramos mencionado outro caso com dimensões semelhantes. A cirurgia revelou ser uma solução terapêutica, onde foram obtidos resultados positivos, tendo o animal uma boa qualidade de vida aos três meses de seguimento pós-cirúrgico.*

Palavras-chave*: Leiomiossarcoma periovárico; neoplasia do trato reprodutivo; cão*

Abstract: *Periovarian leiomyosarcomas in female dogs are rare pathologies and generally have a poor prognosis. We present a case of a 10-year-old intact female dog. The dog presented for consultation due to abdominal discomfort, lethargy, and acute-onset anorexia. Abdominal radiographs and an AFAST were performed, revealing a mass effect. An exploratory laparotomy was conducted, and a large mass (15 cm x 20 cm) was observed in the right ovarian region. A total ovariohysterectomy was performed with excision of the mass, which appeared to involve the right ovary. Histopathological examination revealed that it was a leiomyosarcoma located in the periovarian tissues, of large dimensions, without ovarian involvement. In the literature, we found no other cases with similar dimensions. Surgery proved to be a therapeutic solution, yielding positive results, with the animal having a good quality of life three months after the postoperative follow-up.*

Keywords*: Periovarian leiomyosarcoma; reproductive tract neoplasia; dog*

CASE REPORT

A 10-year-old, intact, mixed-breed female dog weighing 39,4 Kg presented with signs of abdominal discomfort, lethargy, anorexia, and nausea for less than a day. The dog had not vomited or defecated that day. There was no prior diagnosis of any pathology, nor was the dog on any medication. All prophylactics were up to date.

On physical examination, the dog exhibited abdominal pain upon palpation and abdominal distention. Spinal compression was painful. The mucous membranes were pink, but the dog was tachycardic and tachypnoeic. There was no lymphadenomegaly of superficial nodes, no vaginal discharge, and the rectal temperature was 39,3ºC. No other significant clinical signs were observed.

Venipuncture was performed for haematological and biochemical analysis. There were no abnormalities in the red blood cells. Total white blood cell count was within the reference range (15.75 × 10^3/uL; reference 6.00–17.00 × 10^3/uL); however, segmented neutrophils were elevated (14.23 × 10^3/uL; reference 3.62–12.30 × 10^3/uL), suggesting an inflammatory response.

Biochemical analysis showed an increase in alkaline phosphatase (161.00; reference 13.00–83.00), while glucose (105.00 mg/dL; reference 75.00–128.00 mg/dL), creatinine (0.62 mg/dL; reference 0.40–1.40 mg/dL), alanine aminotransferase (26.00 u/L; reference 17.00–78.00 u/L), and calcium (10.80; reference 9.30–12.10 mg/dL) remain normal.

Abdominal radiographs revealed a large mass (15 cm x 20 cm) in the ventrocaudal abdomen (Figure 1).

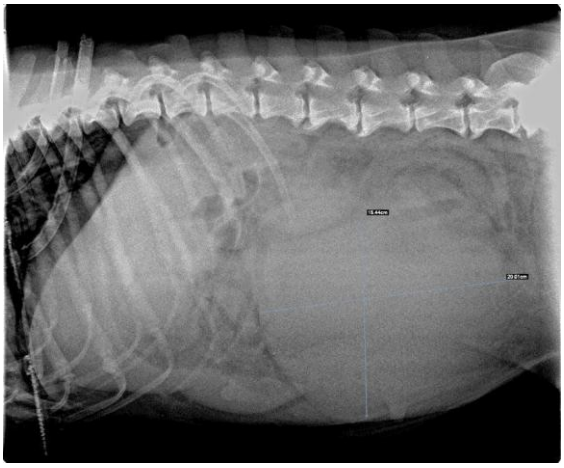

Figure 1 – Lateral abdominal radiograph showing a large mass (15 cm x 20 cm) in the ventrocaudal abdomen.

An abdominal-focused assessment with sonography (AFAST) confirmed the presence of an abdominal mass occupying most of the right ventrocaudal abdomen, with mixed echogenicity and reduced vascularization. There were no signs of uterine content or free peritoneal fluid. It was suspected that the larger mass

visualized on ultrasound was suggestive of a reproductive tumour.

Due to the large size of the mass and the animal's discomfort and lethargy, the dog was hospitalized, and pain management medication was prescribed. Once stabilized, an exploratory laparotomy was performed to determine the origin of the mass. No other pre-operative diagnostic tests were performed.

The dog was pre-medicated with meloxicam (0.2 mg/kg) and amoxicillin + clavulanic acid (12.5 mg/kg) subcutaneously, along with a combination of dexmedetomidine (0.02 mg/kg), ketamine (5 mg/kg), and methadone (0.25 mg/kg) intramuscularly. Induction was done using midazolam (0.2 mg/kg) and propofol (2 mg/kg) intravenously, and anesthesia was maintained with isoflurane.

A total ovariohysterectomy with complete mass excision was performed. The surgery began with a midline skin incision below the umbilicus, followed by a midline incision in the abdominal musculature. A mass measuring approximately 15 cm x 20 cm was observed in the right periovarian region. After removing the uterus, ovaries, adnexa, and the mass, an abdominal exploration was performed, revealing no other notable abnormalities. The abdominal cavity and skin were closed. No intra- or post-operative complications occurred.

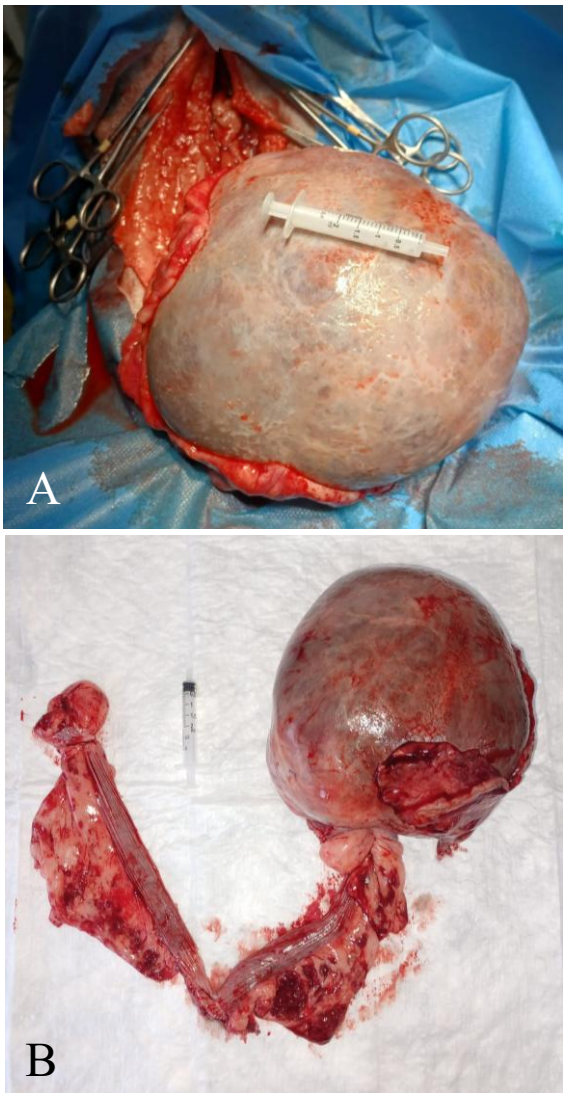

Figure 2- Intraoperative image of the right ovarian mass measuring approximately 15 cm x 20 cm (A). Postsurgical image of the excised uterus and ovaries from the patient. Is observed a large right ovarian mass (15 cm x 20 cm). The left ovary, the uterine body and cervix appeared grossly normal (B).

The removed surgical specimen (uterus and adnexa, left ovary, mass involving the right ovary) was preserved in formaldehyde and

sent to the Histopathology Laboratory for analysis.

The diagnosis was confirmed by histopathology.

A specimen from ovariohysterectomy, weighing 1628,0 grams, was analyzed. The uterus exhibited endometrial cystic hyperplasia with multifocal thickening of the endometrium due to moderate hyperplasia of endometrial glands, which were ectatic and lined by columnar to cuboidal epithelium, supported by oedematous fibrovascular stroma. The right ovary showed a leiomyosarcoma, characterized by a moderately circumscribed, unencapsulated, and infiltrative mesenchymal neoplasm extending to the surgical margins. The tumor consisted of densely cellular bundles of spindle cells with indistinct cell borders, eosinophilic cytoplasm, and oval to fusiform nuclei displaying moderate to marked anisocytosis and anisokaryosis, as well as rare mitotic figures. Multifocal cystic degeneration, necrosis, and intercellular oedema were also observed. The ovarian parenchyma of both right and left ovaries was histologically unremarkable, with no significant microscopic abnormalities identified in the left uterine horn. These findings support the diagnosis of a leiomyosarcoma, a malignancy with potential for recurrence and metastasis, necessitating further clinical staging and monitoring.

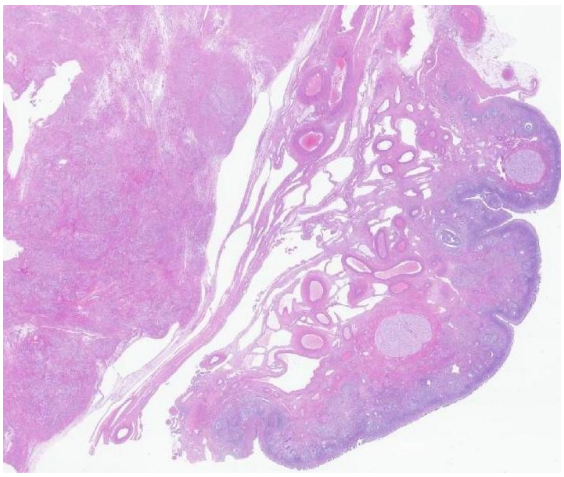

Figure 3- Circumscribed unencapsulated tumour involving the peri-ovarian soft tissue, beneath the rete ovarii (H&E).

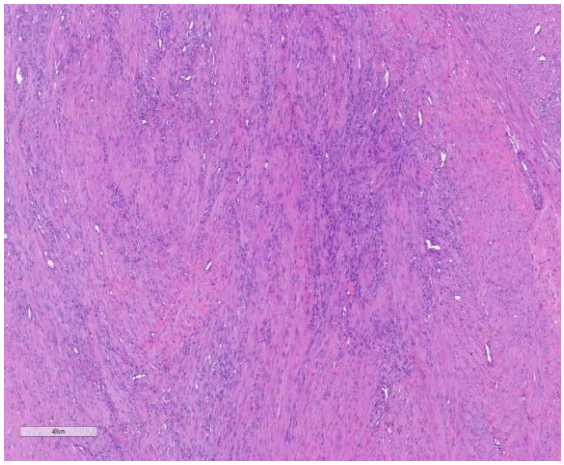

Figure 4 - Tumour composed of interlacing fascicles and bundles of well differentiated neoplastic spindle shaped cells with cigar-shaped nuclei and rare mitosis (H&E).

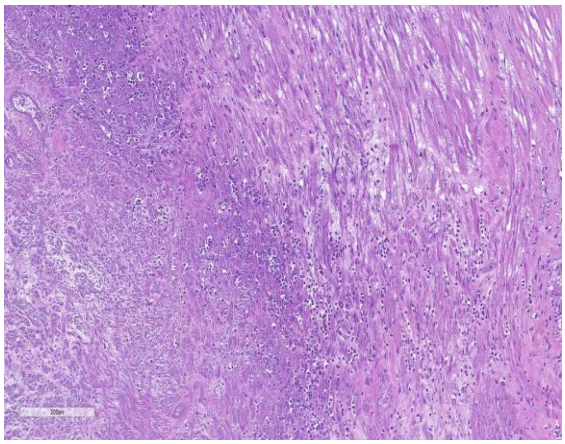

Figure 5 - Tumor necrosis associated to neutrophilic infiltration (H&E).

The dog experienced an uncomplicated postoperative recovery and was discharged 48 hours after the surgery. By day six, the surgical scar was healing normally. The dog showed no clinical complaints and was eating normally. The owners declined a follow-up clinical review, but after five months, they reported that the dog was doing well.

DISCUSSION

Reproductive tract tumours in female dogs are relatively common clinical conditions that can compromise both the health and quality of life of affected animals. The most common types of tumours affecting the reproductive tract in female dogs include mammary tumours, endometrial tumours, ovarian neoplasms, and periovarian neoplasms (involving structures like the fallopian tubes and surrounding tissues) (Russo, et al. 2021; Bhoi, Suthar & Jhala, 2022).

In our case, histopathological examination revealed a leiomyosarcoma, likely originating from an adnexal structure that could not be specifically identified.

Periovarian tumours in female dogs are relatively rare pathologies. They originate in structures surrounding the ovaries, such as the fallopian tubes, ligaments, mesentery, or embryonic remnants, and may be benign or malignant (Bhoi, Suthar & Jhala, 2022).

Malignant periovarian tumours can be classified according to their tissue origin into three categories: 1 - Carcinomas: Originating from peritoneal cells in the periovarian region. The differential diagnosis should consider ovarian carcinoma and metastases from carcinomas of other sites. 2 - Sarcomas: Mesenchymal in origin, including fibrosarcomas and leiomyosarcomas, which may arise in the peritoneum or periovarian ligaments and adnexa. 3 - Mesotheliomas: Arising from mesothelial cells in the peritoneal cavity. The differential diagnosis is difficult with serous carcinomas. These tumors are very rare but extremely aggressive and can invade adjacent organs like the uterus and intestines (Klein, 2007; Serin et al., 2010).

The clinical signs presented in our case (discomfort, lethargy, anorexia, and nausea), are similar to those reported by Kazmierczak et al., (2023), in a case they describe as extremely rare: a malignant oviductal leiomyosarcoma that was successfully operated on.

Regarding the size of the tumour, we found no other cases of periovarian leiomyosarcoma in the literature of this size. Kazmierczak et al., (2023), the dimensions of the removed masses were 3 cm and 5 cm.

The diagnosis of periovarian tumours, while sometimes indicated by a palpable mass on physical examination relies primarily on imaging methods, confirmed by histopathological examination. In our case, although the physical exam revealed abdominal distension, the mass itself was not detected despite its large size. It was the abdominal radiograph that first raised suspicion, and AFAST confirmed the presence of a large solid mass. Reproductive tract tumours are often visualized during abdominal imaging (Saba & Lawrence, 2019).

While ultrasonography, CT, or MRI could have improved diagnostic precision, the animal's concerning clinical state and the owners' informed decision led to an exploratory laparotomy. This provided a visual assessment of the situation, and an ovariohysterectomy with mass removal was performed. Histopathology is required for a definitive diagnosis, which justifies mass excision (Klein, 2007; Saba & Lawrence, 2019).

Histopathological analysis is the gold standard for making a definitive diagnosis and establishing a prognosis. In this case, it was a leiomyosarcoma, likely originating from the adnexal tissues surrounding the right ovary, without invasion of adjacent organs. There did not appear to be metastasis, but additional diagnostic tests (abdominal ultrasound, CT) would have been needed to confirm this. However, the owners declined further diagnostics.

Leiomyosarcoma is a malignant tumour originating from smooth muscle. When it affects the reproductive tract of female dogs, it is usually found in structures such as the uterus or vagina, and more rarely in adnexal tissues. It is a relatively rare neoplasm in companion animals compared to other neoplasms, but its impact on animal health can be significant (Withrow & MacEwen, 2001).

The most common treatment for periovarian tumours in female dogs is surgical removal (Kazmierczak et al., 2023). Depending on the type and malignancy of the tumour, surgery may be

supplemented by chemotherapy or radiotherapy. However, there is limited information on the effectiveness of chemotherapy and radiotherapy in such cases, so these options should only be considered if surgery is not feasible (Saba & Lawrence, 2019). Leiomyosarcomas metastasize in 50% of cases (Cooper et al., 2002). If metastasis is present, surgery may be contraindicated (Cooper et al., 2002; Saba & Lawrence, 2019; Kazmierczak et al., 2023).

In our case, since the tumour was completely removed, histopathology suggested moderate severity, and further diagnostics were not possible due to the owners' refusal. Therefore, surgery was the only treatment performed.

The prognosis for female dogs with periovarian tumours depends on the tumour's histological type, the extent of tissue involvement, and the timeliness of diagnosis and treatment. Benign tumours have a favourable prognosis with complete surgical removal. However, malignant tumours, such as mesotheliomas and sarcomas, may have a more guarded prognosis due to the risk of recurrence and metastasis. In our case, there was no local invasion, and the histopathological characterization of the tumour suggested moderate aggressiveness. Histopathology also revealed cystic endometrial hyperplasia, a common finding in older animals (60% in animals over 6 years old), which we believe is unrelated to the leiomyosarcoma (Moxon, Whiteside & England 2016).

In conclusion, leiomyosarcomas are rare tumours, and we found no reports of cases of this size. Although the prognosis can vary, in this case, the dog has already survived three months. Unfortunately, due to the owners' decision, we could not conduct postoperative control exams to confirm the absence of metastasis. However, based on the described characteristics and the timely surgery, we believe that a relatively good prognosis and a reasonable survival perspective are likely.

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REFERENCES

Bhoi, D. B., Suthar, D. N., & Jhala, S. K. (2022). Ovarian tumours in dogs: An overview. Journal of Livestock Science, 13, 279-287.

Cooper, B. J., Valentine, B. A., & Meuten, D. J. (2002). Tumors of muscle. In D. J. Meuten (Ed.), Tumors in domestic animals (4th ed., pp. 319–363). Hoboken, NJ: John Wiley & Sons.

Kazmierczak, J., Sugai, N. J., Withowski, K. E., Jonatan, A., LeRoith, T., & Cecere, J. T. (2023). Case report: A case of oviductal and uterine leiomyosarcoma in an 11-year-old dog. Frontiers in Veterinary Science, 10, 1227799. https://doi.org/10.3389/fvets.2023.1227799

Klein, M. K. (2007). Tumours of the female reproductive system. In S. J. Withrow & D. M. Vail (Eds.), Small animal clinical oncology (4th ed., pp. 610-618). St. Louis: Saunders Elsevier.

Moxon, R., Whiteside, H., & England, G. C. W. (2016). Prevalence of ultrasound-determined cystic endometrial hyperplasia and the relationship with age in dogs. Theriogenology, 86(3), 976–980. https://doi.org/10.1016/j.theriogenology.2016.03.022

Russo, M., England, G. C., Catone, G., & Marino, G. (2021). Imaging of canine neoplastic reproductive disorders. Animals, 11(5), 1213. https://doi.org/10.3390/ani11051213

Saba, C. F., & Lawrence, J. A. (2019). Tumors of the female reproductive system. In S. J. Withrow, R. L. Page, & D. M. Vail (Eds.), Withrow and MacEwen's small animal clinical oncology (6th ed., pp. 597–603). Philadelphia, PA: Saunders.

Serin, G., Aydogan, A., Yaygingul, R., & Tunca, R. (2010). Uterine leiomyosarcoma in a dog: A case report. Veterinary Medicine, 55(8), 405–408. https://doi.org/10.17221/2959-VETMED

Withrow, S. J., & MacEwen, E. G. (2001). Tumors of the female reproductive system. In D. M. Vail, D. H. Thamm, & J. M. Liptak (Eds.), Small animal clinical oncology (pp. 445–454). Philadelphia, PA: Saunders.