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An unconventional approach in the treatment of canine peritoneal mesothelioma with ultra-diluted *Viscum album*: Case report

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Abstract
Mesothelioma is a diffuse and primary neoplasm, arising from mesothelial cells that line the cavitary organs such as peritoneum, rarely found in dogs, it is aggressive and has a high mortality rate and no effective treatment with low therapeutic response to chemotherapy and radiotherapy: (1) Background: The objective of the clinical study was to use ultra-diluted *Viscum album* in monotherapy, analyzing the staging and anti-metastatic potential after splenectomy. The therapeutic methodology according to the Law of Similar described in Homeopathy was through the combination of ultra-diluted *V.a* in combined potencies. (2) Methods: The objective of the clinical study was to use ultra-diluted *V.a* in monotherapy, analyzing the staging and anti-metastatic potential after splenectomy. The therapeutic methodology according to the Law of similar described in Homeopathy was through the combination of ultra-diluted *Viscum album* in combined potencies by subcutaneous route. (3) Results: The results showed that the combined ultra-diluted *Viscum album* promoted modification of the cystic structures and staged the abdominal mass, preventing metastases for 30 months. (4) Conclusions: We conclude that although peritoneal mesothelioma is an extremely serious neoplasm, with high metastatic potential, the ultra-diluted *Viscum album* protocol increased survival without the use of any chemotherapeutic substance.

Keywords: cancer, mesothelioma, unconventional treatments, *Viscum album*, dog

1. Introduction
Mesothelioma is a diffuse and primary neoplasm, arising from mesothelial cells, which line the cavitary organs such as the peritoneum. Rarely found in dogs, it is aggressive and has a high mortality rate [1]. The etiology is multifactorial, but older males may be more affected [2]. Furthermore, its appearance may be related to exposure to chemicals such as asbestos, fungicides and herbicides [3]. Clinical signs are nonspecific, but the pericardium and peritoneal type cause dyspnea, dry cough, weight loss [4] and abdominal swelling [3]. The definitive diagnosis is obtained by histopathology [5]. However, there is no effective treatment, intracavitary cisplatin is used palliatively, but the prognosis is poor. Ultra-diluted *Viscum album* (Figure 1) has been used for over 100 years worldwide, highlight it as a therapy in integrative oncology [6] especially in animals with different types of severe neoplasms [7].

Fig 1: This is a *Viscum album* (V.a) *in locus*

Viscum album (V.a), originally found in Europe, is a semi-parasitic vegetable, indicated as a complement for several types of cancer [8]. The active proteins in its extract are lectins and viscotoxins, being considered the main antitumor agents [9] as P13K/AKT, JNK, P38, MAPK pathways signaling the caspase cascade [10]. This study aimed to monitor the clinical evolution through biochemical tests, ultrasound, and clinical signs, on the development and progress of peritoneal mesothelioma, concomitant with treatment with ultra-diluted *V.a*. Depending on the stage of the disease and the patient's reaction, various regimens, doses, and routes of application are used in cancer therapy [11].

2. Materials and Methods

The dog was seen at UniFaJ (Jaguariúna, SP, Brazil) on 11/06/18, an animal *Canis familiars*, SRD, male, 3 years old, 30 kg, with a history of clinical complaint of chronic dermatopathy for 3 years, chronic diarrhea with blood for more than 1 month, rectal prolapse, loss of appetite and abdominal pain, which underwent emergency care and was referred for immediate surgical intervention. Ultrasound imaging exams were performed to observe the evolution of the tumor (Table 1) as well as biochemical tests (Table 2). The descending colon mass and splenomegaly were visualized and removed for histopathological.

Table 1: Tables should be placed in the main text near to the first time they are cited

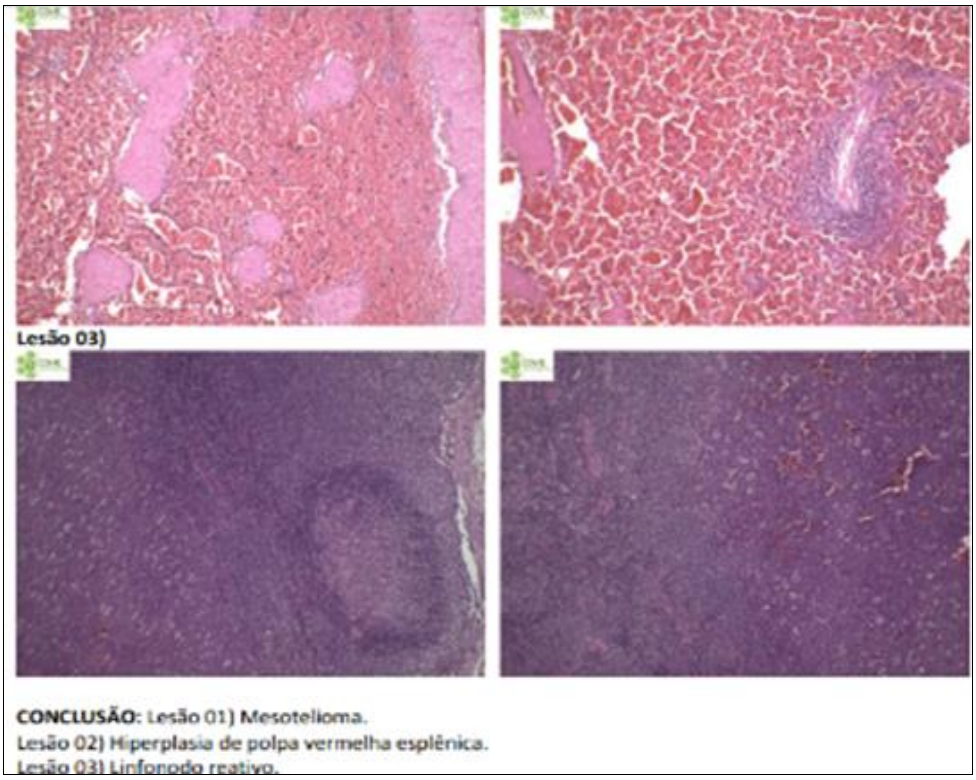
	06.11.18 (US) cm²	**23.03.19 (US) cm²**	**05.11.19 (US) cm²**	**28.08.20 (US) cm²**	**10.05.21 (US) cm²**
descending colon	3,2x2,0		0,19-0,24 without changes	0,12 without changes	1,21x6,0
	(L) 3,19x0,50 (R) 3,5 x 0,74	(L) 2,2 x 0,52 (R) 2,4 x 0,56	***(L)*** 2,5 x 0,51 (R)2,3 x 0,45	(L) 3,25 x 0,72 (R) 2,52 x 0,65	undefined, presence of large structure with irregular contours, compatible hyperplastic/ neoplastic area/adhesion to organs
Lymph nodes	4,0x3,2	4,1x2,1	without changes	without changes	2,47 x 1,96, 3,45 x 2,30
Stomach cm thickness	0,48	0,95	0,44, (L)2,2 x 0,52 (R) 2,4 x 0,56	0,39	0,30
Pancreas	1,4		0,66	1,00	0,91
Liver	without changes	without changes	without changes	liver disease	liver disease

Table 2: Results of laboratory tests

Profile	**05/11/2018**	**10/05/21**	**08/06/21**
Red Cells	4,5mil/ mm^3	3,95mil/ mm^3	3,4mil / mm^3
Globular volume	34%	31%	24%
Hemoglobin	10,7%	9,8%	7,6%
Total proteins	7,2g/ml	7g/ml	6,6g/ml
Platelets	270mil/mm^3	438mil/mm^3	260mil/mm^3
Leukocytes	16,5 mil/mm^3	8300mil/mm^3	36mil/mm^3
eosinophils	1%	4%	2%
Urea		39mg	65 mg
Creatinine		1,45mg	1,8mg
ALT		33UI/DL	22 UI/L
Glucose		-	77mg/dl

Histopathological examination revealed mesothelioma examination revealing (Figure 2: (a) Description of patient, (b) Description of lesion featuring mesothelioma. After surgical procedure and diagnosis, the patient was referred to the clinic Petquantic en Campinas, SP, Brazil, on 12/02/18 and on that same date the injectable homeopathy protocol was prescribed in 3 phases, where in phase 1 the protocol was daily, with subcutaneous applications, of one ampoule (Figure 3) of V.a $1x10^{-3}$+ $1x10^{-6}$ (day 1), Va $1x10^{-9}$ +$1x10^{-12}$ (day 2), V.a $1x10^{-30}$ + $1x10^{-3}$ (day 3), Va $1x10^{-6}$ +$1x\ 10^{-9}$ (day 4), Va $1x\ 10^{-12}$ +$1x10^{-30}$ (day 5) and so, the protocol was repeated for 20 days. In addition, for 1 month, once a week, the patient returned to the office for a session of Chroma therapy and minor hemotherapy, being associated with an ampoule with V.a $1x\ 10^{-2}$. In phase 2, the patient started to receive the same combination subcutaneously, but on alternate days, for 30 days, maintaining the complement of Chroma therapy and hemotherapy. In phase 3, the same protocol was performed, three times a week, exclusively via the subcutaneous route, but performed at home.

(a) Description of patient



(b) Description of lesion featuring mesothelioma

Fig 2: Histopathological Report

Fig 3: *Viscum album* ultra-diluted

3. Results

The patient had a survival with favorable clinical evolution, verified by the reduction and modification of the cystic mass and the staging of the disease during the treatment period reported by ultrasound imaging (Table 1), using the therapy with ultra-diluted *V.a* in combinations of potencies, without visible clinical alterations, no signs of pain or discomfort in any part of the body, he maintains his habits and routine normally and the treatment is carried out in the home environment with periodic visits to the clinic. Of the clinical signs and biochemical alterations most described in the literature were not observed in this clinical report, until the 30th month of treatment, when anemia and reduction of blood cells, leukocytosis were observed due to the return of inflammatory colitis as per x-ray image (Figure 4) because of metastasis but, did not show side effects because of the protocol used with homeopathy, unlike the drugs available in chemotherapy.

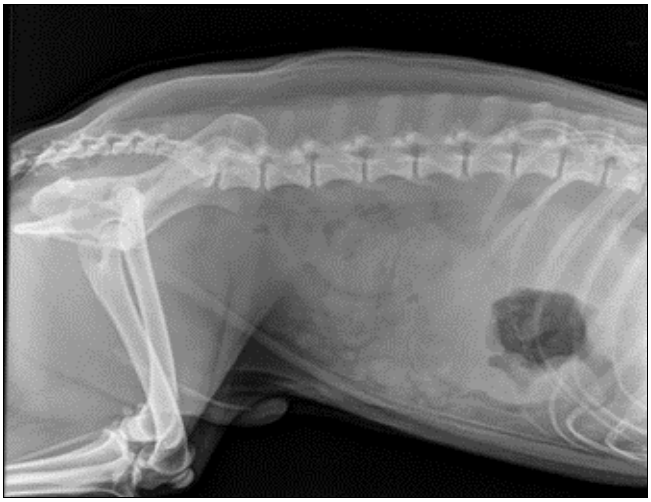


Fig 4: Abdominal X-ray of metastasis (10.05.21**)**

4. Discussion

Viscum album is an unconventional therapy that has been shown to have therapeutic potential in several neoplasms such as chondrosarcomas, hemangioma of dogs and cats [7] and human malignant pleural mesothelioma that also received only treatment with *V.a*, without the use of any type of chemotherapy, with a survival of 56 months with therapy [12] as opposed to what is indicated in conventional medicine and reported in studies carried out by [13] that recommend chemotherapy palliative, indicating that the estimated survival ranges from 129 days to 27 months, with several side effects and toxicity that can lead to the patient's death, it is verified by the biochemical exams (Table 2) that there was no leukopenia, renal failure, or myelosuppression as reported in the use of cisplatin [14]. The immunomodulatory action observed in the aqueous extract of this plant was also observed in its ultra-diluted and dynamized version [15, 16] with cytotoxic and immunomodulatory response in *V.a* $1x10^{-3}$ and $1x10^{-30}$ preparations. Many animal studies, as well as non-randomized, randomized and cohort studies showed that mistletoe extracts exhibit potential therapeutic effects in breast and gynecological cancer [17]. Still, it is correct to state that the instituted treatment was effective in its purpose, increasing the patient's survival, decrease among the cancer growth rate, improving immunity, as well as her quality of life. Based on its anatomopathological and histologic similarity, the ultra-diluted *V.a* has been used in homeopathic preparations for the complementary treatment of cancer patients and immunomodulatory [18]. The homeopathic therapeutic model is characterized by biological modification stimulating the vital forces that promote quality of life, promoted the control and staging of tumor disease, reduction of mass reduction and delaying the onset of metastasis in critical patients in agreement with reports [19] without the use of chemotherapeutics or other immunosuppressive drugs.

5. Conclusions

We conclude that the use of ultra-diluted Viscum album protocol in monotherapy in $1x10^{-2,}$ $1x10^{-3}$, $1x10^{-6}$, $1x10^{-9}$, $1x10^{-12}$, $1x10^{-30}$ dynamized combinations by subcutaneous route provided the patient with staging and 30-month survival. This article demonstrates that an injectable ultra-diluted homeopathic form can be a therapeutic option for the staging not only of the tumor mass, but also of complications resulting from metastasis, with no or less adverse effects due to the toxicity of chemotherapeutics that unparalleled alters the patient's quality of life. It is important to consider the integrative treatment models, they have certain peculiarities that modify the evolutionary response of the neoplastic patient.

6. Informed Consent Statement: This is a clinical case report where the tutor responsible for the patient authorized the use and the publication data.

7. Data Availability Statement: Data presented in this study are available upon request to the author for correspondence.

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9. Conflicts of Interest: The authors declare no conflict of interest

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