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TELEMEDICINE REPORT: Oncology

Report number: TELE-XXX Report date: XXXX

Referring Veterinarian: XXXXXXX

Referring Practice: XXXXX

Email address: XXXXXX

Owner: TURNER Patient: Nula

Species: Canine Breed: German Shepherd Dog Sex: Female Neutered Age: 2 years, 10 months

Associated cases: XXX

Clinical History:

5-6 day history of right hind swelling, on exam swelling due to pitting oedema, abdominal palpation revealed and large firm mass, on ultrasound mass has a mixed echogenicity, is very large and displacing normal abdominal structures. Abdominal, thoracic and appendicular CT images were interpreted by Dr Ricardo Guillem-Gallach and revealed a large, heterogeneous contrast-enhancing mass lesion in the region of the right adrenal gland, right sided hydronephrosis, peritoneal free fluid, pelvic limb subcutaneous oedema as well as intra and extra-thoracic lymphadenomegaly.

Date: 22/07/2015

Questions to be answered:

1. Is the abdominal mass lesion surgically resectable?

2. What are the most likely differential diagnoses?

3. What is the likely prognosis?

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Diagnostic interpretation:

Disseminated neoplasia (abdominal and thoracic) is highly likely given the imaging findings in this case. The findings could be consistent with a primary intra-abdominal tumour, such as an adrenal gland tumour (phaeochromocytoma or an adrenal-cortical carcinoma would be high up on the differentials if this was a primary adrenal tumour), that has metastasised. Other alternatives could include other primary abdominal neoplasms (including various sarcomas and carcinomas) as well as multi-centric round cell tumours (such as lymphoma or histiocytic disease). The young age of this dog does not make any specific diagnosis more likely but given the breed haemangiosarcoma should be considered. The subcutaneous oedema of the thoracic limbs is likely the result of vascular and lymphatic obstruction caused by the intra-abdominal pathology. The mass is also the probable cause of the right-sided hydronephrosis and the acquired porto-systemic shunts (PSSs).

Conclusions:

The advanced nature of this disease alongside the presumed secondary renal and lympho-vascular pathology makes managing this case very challenging. I am in agreement with Dr Guillem-Gallach that the abdominal mass lesion is not completely resectable due to the degree of vascular invasion described and debulking surgery would be extremely challenging. Hypothetically, even if excision were possible there would still be a substantial intra-thoracic residual disease burden, as such surgery would be unlikely to be of long-term benefit without adjuvant therapy. Clinically I think the priority for Nula would be to see if there is any way of helping reverse or ameliorate the changes to the vasculature, as without palliating these signs the limb oedema, renal pathology and PSSs will all progress. As surgery is not possible then other treatment options would include medical management and radiation therapy (in my opinion the latter would also be difficult to perform given the location of the mass as significant radiation dose would likely be deposited in other organs and treatment planning will also be challenging). The likelihood of response to medical therapy (and radiation) is dependent on the histotype of the tumour (if this is lymphoma then the best-case scenario would be a complete remission of measurable disease which could possibly be long lived, on the flip side if this was a metastatic phaeochromocytoma then sadly I would not anticipate a good response to drug therapy and there is likely little that could be done to definitively help Nula). The oedema is unlikely to respond to any other medical therapy such as diuresis, as it is the result of a physical obstruction, I would also be wary of using cortico-steroids at this point as although they could theoretically aid with tumour associated inflammation they may interfere with any planned diagnostics if Nula's owners are keen to pursue a definitive diagnosis.

Additional comments:

Given Nula's young age and the presentation of this case there is no one neoplastic disease that would stand out as being most likely and I would prioritise obtaining a tissue biopsy as this will guide treatment options and prognosis. As the axillary lymph nodes were noted to be mildly enlarged on the CT, one approach would be to attempt aspiration of these nodes, if we were dealing with a multi-centric round cell tumour such as lymphoma then cytology of these nodes could be definitive, alternatively other tumours such as metastatic sarcomas do not exfoliate as well so diagnostically FNAs may not be as useful. Aspiration of the axillary lymph nodes should give rapid results and is low risk. Ultrasound guided FNAs of the abdominal mass could also be considered but caution must be exercised for this, as aspiration of adrenal glands (if this is indeed an adrenal mass) is not without risk. Prior to performing any type of tissue biopsy of this mass I would check coagulation times and monitor Nula post-sample for bleeding, an incisional biopsy could also be considered. The dilemma in such cases is that without a biopsy it is impossible to advise on potential treatment options however, there is the possibility that an invasive test is performed and an untreatable condition is diagnosed. Functional

adrenal gland tumours include phaeochromocytomas and occasionally adrenocortical carcinomas (this cannot be an adenoma due to the size of the mass and metastasis). The latter can secrete endogenous cortisol, sex steroidal hormones and rarely aldosterone, however, interpretation of endocrine panels such as ACTH stimulation and low dose dexamethasone suppression tests will be difficult given the fact that Nula is systemically unwell due to her disease burden. However, assessment of accompanying pathophysiologic changes for phaeochromocytoma could support this diagnosis therefore I would recommend recording blood pressure and considering an ECG if Nula is tachycardic as catecholamine secretion results in marked cardiovascular changes (is there any history of collapse, anxiety, weight loss, PU/PD that would support phaeo?). Measurement of urine catecholamines has also proved useful for diagnosing phaeochromocytoma and could also supportive if tissue biopsy was not pursued, whilst published results show this test to be useful I am unsure as to the current clinical availability of this test in the UK, it could be worth contacting a clinical pathologist at your usual reference laboratory to enquire as to whether such a test could be run.

Prognosis in this case depends on the definitive diagnosis. Below is a list of possible neoplastic differentials and corresponding prognosis:

- Primary adrenal phaeochromocytoma with thoracic metastases carries a bleak prognosis as resection would not be possible and neither chemotherapy nor radiation has any proven efficacy for dogs suffering from this disease.
- Functional primary adreno-cortical carcinoma with metastases carries a poor prognosis. For dogs with functional tumours resulting in adrenal dependent Cushing's, mitotane has been described as an alternative to adrenalectomy. Mitotane is used at a high dose in this setting as a cytotoxic agent and patients need careful monitoring, whilst such treatment could be effective, metastatic disease negatively impacts survival.
- Other primary abdominal tumours such as haemangiosarcoma, carcinomas and other sarcomas with thoracic metastases would also carry a poor prognosis as the disease is metastatic and such gross disease does not usually respond well to medical therapy. Non specific therapies such as low dose metronomic chemotherapy and tyrosine kinase inhibitors can be of benefit to dogs with advanced stage tumours, my concern in this case is that even if the primary tumour were to respond to such drugs it would not be fast enough to slow the progression of the marked vascular compromise and renal disease seen in Nula's case.
- Multi-centric round cell neoplasms- this is not a classic presentation for such diseases but lymphoma is certainly a differential. Lymphoid neoplasia can respond very rapidly to standard cytotoxic drug protocols and remissions are frequently durable. If this is lymphoma then the presence of clinical signs is a negative prognostic indicator, nonetheless if Nula's owners wanted to pursue treatment for this condition then we could hope to see a response. Other multi-centric round cell neoplasms such as aggressive plasma cell tumours and histiocytic sarcoma respond variably to chemotherapy.

Summary of questions

1. Is the abdominal mass lesion surgically resectable?

   It would not be possible to surgically resect this mass completely, any sort of debulking surgery would be of questionable benefit to Nula and would be a high risk procedure. As this disease is disseminated then, systemic drug therapy represents the best possibility for a positive outcome.

2. What are the most likely differential diagnoses?

   This is highly likely to be a neoplastic disease process however, atypical granulomatous or infectious aetiologies cannot be completely excluded. Most likely tumour types would include primary adrenal neoplasia (phaeochromocytoma and carcinoma) with thoracic metastases, other primary abdominal neoplasms (e.g. haemangiosarcoma) with thoracic metastases and multi-centric round cell neoplasia (e.g. lymphoma). Tissue biopsy is recommended to obtain a definitive diagnosis

3. What is the likely prognosis?

   For primary adrenal and intra-abdominal neoplasia the long-term prognosis is sadly poor. In certain scenarios medical therapy could help palliate clinical signs, in this case if such a disease was diagnosed then treatment would have to be very carefully considered as there is compromise to the hepato-portal system as well as the right kidney meaning hepatically metabolised/ excreted drugs and renally excreted drugs could well cause toxicities at standard doses so dose reduction would likely be prudent. If a tumour response were seen then such treatment would only be palliative in the short term. If lymphoid neoplasia was diagnosed the prognosis would be guarded but, in my opinion better than the other tumour types, the same concerns regarding drug metabolism and excretion would need addressing but I believe it would be worth attempting treatment. Other round cell neoplasms have variable responses to various drug protocols. Please inform me of any results if tissue biopsy is performed and I will be able to give more specific answers regarding prognosis and what may be the most appropriate way to go forward with treatment. This is an unusual and complicated presentation so I would be keen to know what the final diagnosis is and I am more than happy to be contacted for any further discussion regarding Nula's on-going management, hopefully we can do something to help her.

Reporting Oncologist:

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