

## Transcatheter Arterial Chemoembolization for the Treatment of Canine Appendicular Osteosarcoma

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### Introduction

Osteosarcoma is the most common primary bone tumor in dogs. The standard of care for treatment is limb amputation followed by chemotherapy.<sup>1</sup> However, there are circumstances when amputation is not possible. Transcatheter arterial chemoembolization (TACE) of tumors has been reported for the treatment of nonresectable liver tumors,<sup>2-4</sup> renal tumors<sup>5</sup> and osteosarcoma<sup>6</sup> in humans. As well, it has been reported on an anecdotal basis for the treatment of skull tumors in dogs. This technique involves the use of interventional radiology as a minimally invasive method to deliver a chemotherapeutic and an embolic agent directly to the tumor via its blood supply under fluoroscopic guidance. The goal is to direct therapy to the tumor, without disrupting the blood supply to the surrounding structures and minimizing systemic toxicity.

### Objective(s)

The development of a novel technique for limb spare in dogs with osteosarcoma using chemoembolization.

### Materials and Methods

Dogs presenting with a distal radial osteosarcoma will be given all treatment options that are considered standard of care for osteosarcoma. For owners that decline standard of care, this novel technique will be discussed. The patient will be staged for pulmonary and bone metastasis. The patient will be anesthetized and transported to radiology for catheterization and visualization of the blood supply to the tumoral segment of the affected segment of bone under fluoroscopic guidance. Chemoembolization of the tumoral bone segment will be performed using carboplatin. After injection of carboplatin into the arterial supply, embolic microspheres will be injected slowly to induce embolization of the tumoral bone segment.

If the investigators deem that the limb is at risk for a pathologic fracture based on radiographic assessment, it will be treated with a prophylactic plate during a subsequent anesthetic period. The patient will receive analgesics and pamidronate as part of a standard bone pain palliation protocol. Full course chemotherapy will be recommended but will be administered at the discretion of the owner.

### Anticipated Results

This novel method will provide an alternative method of limb spare that will be palliative in nature. The patients will have palliation of bone pain and limb

preservation. The tumor is expected to progress, but it is not known if this technique would allow for failure due to metastatic disease, rather than due primary tumor progression. Side effects in clinical patients are expected to be minimal, as this was the case in a recent report of 32 human osteosarcoma patients treated with this technique.

#### Significance

Chemoembolization for appendicular osteosarcoma has not been performed in dogs previously. This may provide a palliative limb spare option that is minimally invasive. Further, this option may have applications for metastatic bone cancer in dogs and humans.

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