CollaVET®
TPLO non-union treated with a CollaVet sponge soaked with BMP.

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Case study courtesy of
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Case Summary:

Teak, a 10-yr-old male Labrador retriever presented to The Veterinary Referral Surgical Practice in January, 2012 for complications associated with a left TPLO performed in August, 2011. In September of 2011, Teak became acutely non-weight bearing lame. 4 week post-operative radiographs revealed a proximal fibular fracture with no evidence of bone healing and a mild shift at the osteotomy site. Teak was documented to be toe touching to non-weight bearing lame from September, 2011 to January, 2012.

Radiographs in January, 2012 revealed an osseous union of the fibular fracture and a nonunion of the tibial osteotomy. A recommendation of a TPLO revision was made and performed the next day.

An aseptic surgical approach was made to the left proximal tibia where the TPLO implant was removed. The non-union portion of the osteotomy was excised with a sample tissue submitted for culture and sensitivity and histopathological analysis. (Notice that the TPLO non-union gap is clearly visible).

Introduction

Post surgical non-unions of fracture/osteotomy repair can be caused by a number of factors including less than adequate stability, reduced blood flow, infection, effects from the use of various drugs or other aggravating factors. In many cases, surgical treatment is the only alternative available. Surgical intervention may include the use of bone graft (autograft or allograft), bone graft substitute, internal fixation and/or external fixation or a combination of items. In this particular case, a collagen sponge (NGD CollaVET) soaked in BMP was used, along with allograft and autograft, to stimulate rapid healing around the osteotomy site. Rather than apply the BMP to the allograft and autograft, it was applied to the sponge which acts as a localized time release carrier. The sponge allows for application to a specific location along with a stable elution of the drug over a period of days. The sponge will then be completely resorbed in no more than eight weeks, leaving behind a healed osteotomy.
The tibia was reduced into axial alignment during placement of a hybrid fixator and the osteotomy gap was packed with cancellous autograft and allograft. After graft placement, the osteotomy site was covered on the medial and caudal aspects of the tibial metaphysis with a Collavet sponge that had been soaking in a solution of bone morphogenic protein (BMP) for 20 minutes prior to placement on the tibia.

The surgical site was closed and the remaining components of the fixator were routinely applied. Teak recovered and had a routine post-operative rehabilitation/recovery. Culture and sensitivity results revealed no evidence of bacteria and the histopathological analysis was diagnostic for a nonunion fracture likely secondary to thermal necrosis.
Six Weeks Post Surgical Removal
At six weeks following the revision and BMP CollaVET implantation, Teak was minimally lame and radiographs revealed a healed osteotomy. The hybrid fixator was at that time removed. Teak entered an eight week course of rehabilitation and returned to normal activity.

Discussion:
Post surgical non-unions of fracture/osteotomy repair can be caused by a number of factors including less than adequate stability, reduced blood flow, infection, effects from the use of various drugs or other aggravating factors. It is well documented that collagen has been successfully used as a vehicle for localized drug delivery due to its biocompatibility and non-toxic nature. In this particular case, rather than potentially limiting the effectiveness of the BMP, it was absorbed by the CollaVET sponge and then placed directly on the exact location.

Using the sponge for placement of the BMP rather than placing it on the graft material did not allow for rapid migration away from the treatment area. Therefore, soaking the collagen sponge allows for accurate placement of the appropriate amount of the BMP and for stable elution of the BMP over time. The CollaVET type 1 collagen sponge provided a simple, easy to use solution along with the BMP to successfully treat the non-union.