Osteotomy-Related Tumors

Tumors occurring at fracture and bone implant sites have been reported, but incidence after tibial plateau leveling osteotomy (TPLO) is rare. In this report, a 7-year-old spayed female mastiff presented for a 3-month duration of left pelvic limb lameness with left stifle swelling and pain on palpation. Her left cranial cruciate ligament had been repaired 6 years prior. Radiographs revealed a lytic and proliferative bone lesion around the site of the TPLO bone plate; needle biopsies confirmed osteosarcoma.

Osteosarcoma can be one of the most frequently diagnosed primary bone neoplasms in dogs, and a majority of patients can die of metastatic disease within 1 year of diagnosis if treated with amputation alone. The disease occurs most frequently in the proximal humerus and distal radius, less commonly in the tibia or fibula. Different mechanisms have been proposed to cause osteosarcoma: ionizing radiation, fatigue microdamage in large dogs, chronic inflammatory processes, bone infarcts, and altered cellular activity of osteoblasts and osteoclasts associated with fractures and/or metallic implants. The prevalence of TPLO-related tumor formation appears to be higher than that of spontaneously developing malignant bone tumors affecting the tibia and fibula. Potential causes of fracture-associated sarcoma include corrosion of metal implants leading to release of chemical compounds or metallic particles into the bone, local tissue reactions to implants, chronic infection, delayed bone healing, and impaired vascularity to the fractured bone.

Commentary

Three cases of cancer occurrence following TPLO surgery have been reported; each had a Slocum plate implanted, which one report suggested may have been of inferior metal quality. In this case, radiographs revealed a tumor centered on the TPLO osteotomy line. Despite palliative treatment, the dog was euthanized 8 weeks after diagnosis. The authors addressed an abstract in which 0.075% of TPLO cases at least one year after surgery were diagnosed with a proximal tibia tumor. Comparing this with an insurance study in which the prevalence of bone tumors in the same location was 0.017%, TPLO-related tumors were 4.4 times as common as non-TPLO related proximal tibial tumors. However, many variables are unaccounted for, and this conclusion of increased incidence of bone cancer after TPLO should not be propagated in the literature.

A quality wrought plate was used in this case. Without a complete postmortem evaluation, evidence of corrosion previously seen with Slocum plates was not evaluated, thus no substantive comment can be made. Although rare, fracture- or osteotomy-associated sarcoma formation should still be considered.—Jonathan Miller, DVM, MS, DACVS cb

Source
