TPLO Plates: Look to Manufacturing Method

Tibial plateau–leveling osteotomy (TPLO) is an increasingly popular method for treating anterior cruciate ligament ruptures in dogs. In recent years, there have been anecdotal reports of neoplasia near plate implantation sites. In this study, metallurgic analysis was performed on 3 new Slocum TPLO plates, 8 retrieved TPLO plates, and 1 new Synthes dynamic compression plate. The 3 new Slocum plates were randomly selected from a pool of 38 unused plates. The 8 retrieved Slocum plates were from dogs and had been in place for 8 to 79 months; 1 plate was from a dog with sarcoma. The new Synthes plate was for use in humans. In addition, histologic examination was performed on tissue from sites adjacent to the plates. All plates were made from stainless steel by a casting process. Light microscopy of all new plates and the 8 retrieved plates showed a microscopic structure typical of a dendritic 2-phase cast alloy with many inclusions. Compared with new plates, used plates had many inclusions, gaps in the matrix, and pitting on the surface. Histologic tissue from around the used plates revealed fibrous connective tissue with many foci of mononuclear inflammatory cells, fibroblasts, and debris. Histologic examination also revealed intra- and extracellular particulate debris. Scanning electron microscopy revealed 2 groups of metallic material consisting of chromium, nickel, and molybdenum; and iron, aluminum, and silicon.

COMMENTARY: Concerns about the Slocum TPLO plate have been raised by surgeons in the past. While both an increased incidence of infection and neoplasia have been anecdotally associated with the use of these plates, a direct cause-and-effect relationship has never been proven. However, this paper brings to our attention the important differences between cast stainless steel plates (Slocum) and wrought stainless steel plates. Given the variability in cast plate composition and strength, along with the increased concern for corrosion, I agree with the authors that the use of cast plates cannot be recommended. Several wrought stainless steel TPLO plate options are now available and should be considered in lieu of a cast plate.—S.L. Schaefer, MS, DVM, Diplomate ACVS