Stem Cell Therapy: Promising Modality?

Mesenchymal stem cells (MSCs) have shown promise in veterinary and human medicine studies. While little has been published regarding MSCs in dogs, there have been reports of successful therapeutic use in canine osteoarthritis, disk degeneration, and bone regeneration. When given systemically, MSCs can migrate to the site of injury. This homing mechanism is attributed to the presence of multiple growth factor, cytokine, and CD44 receptors on MSCs, as well as to their ability to attach to injured epithelium. The therapeutic effect of MSCs was once attributed to their ability to differentiate into a specific cell lineage, but paracrine effects likely also play a role. More knowledge about canine MSCs will help identify their potential therapeutic applications.

In this study, MSCs from donor tissue sources (ie, muscle, periosteum) were isolated and compared with the conventional MSC sources of bone marrow and adipose tissue. Bone marrow, adipose tissue, muscle, and periosteum were collected from 7 randomly selected dogs slated for euthanasia. MSCs were successfully developed from all 4 sources. Periosteum provided the highest postexpansion MSC yield per gram of tissue within a clinically relevant time period. This study added information about MSC and what tissues may be of value as cell sources in the future.

Emergency Management of Urethral Obstruction

Urethral obstruction is a life-threatening condition in cats, but prognosis is usually good with 93.6% of cats surviving to discharge. Client decisions regarding therapy are often based on financial considerations. Having a method to predict the length of hospitalization (LOH) stay could help educate and prepare clients for this cost.

Medical records from 2 specialty referral hospitals were retrospectively reviewed for several parameters (eg, rectal temperature, blood urea nitrogen, creatinine) and 243 cases met the established criteria for inclusion. Of these, 81 were hypothermic, 134 normothermic, and 28 hyperthermic. Patients were in the hospital for a median duration of 35 hours (range, 3-126). There was no significant association between hospitalization hours and rectal temperature. There was an increasing trend, although insignificant, toward longer LOH stay in the hypothermic group. Increases in BUN and creatinine were associated with longer LOH stay and may indicate eventual treatment cost for an obstructed male cat.

Commentary

Emergency management of male cats with urethral obstruction involves gaining vascular access, evaluating electrolyte abnormalities, and establishing urethral patency, usually followed by 2-3 days of hospitalization to manage an indwelling urinary catheter. These procedures make management of urethral obstruction expensive, and recurrent episodes (common) compound this problem. Pretreatment azotemia is associated with increased LOH stay and subsequent increased cost. Pretreatment azotemia may be partially caused by dehydration and acute kidney injury (AKI) in addition to obstruction of urine flow. Greater magnitude of azotemia at presentation could indicate more severe AKI secondary to increased hydrostatic pressure to the renal pelvis, tubules, and Bowman’s capsule, leading to longer recovery.—Gregory F. Grauer, DVM, MS, DACVIM

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