

# Musculoskeletal Injuries and Regenerative Medicine in the Elderly Patient



John C. Cianca, MD<sup>a,\*</sup>, Prathap Jayaram, MD<sup>b</sup>

## KEYWORDS

- Regenerative medicine • Platelet-rich plasma • Stem cell therapy • Prolotherapy
- Osteoarthritis

## KEY POINTS

- Regenerative medicine is an emerging field that has value in musculoskeletal injuries and conditions in the elderly.
- Viscosupplementation and prolotherapy are established therapies that continue to show efficacy in the elderly population.
- Platelet-rich plasma injections and mesenchymal stem cell therapy are emerging therapeutic strategies that have shown a good safety profile.

## INTRODUCTION

Regenerative medicine has gained increasing popularity in its clinical applications, particularly in the field of musculoskeletal medicine. Regenerative medicine, a broad term, can be thought of as a particular medical strategy that strives to rebuild and restore diseased tissue to normal physiologic tissue baseline. Simply put, regenerative strategies augment the body's innate physiology to heal pathologic processes.<sup>1</sup> This article focuses on specific regenerative strategies and the uses of them for common pathologies in the aging adult, including platelet-rich plasma (PRP), mesenchymal stem cells (MSCs), viscosupplementation, and prolotherapy.

## COMMON CONDITIONS AFFECTING THE ELDERLY

### *Tendinopathy*

Tendinopathy is common degenerative condition seen in all adults, but in particular in tendons of the elderly. Tendinopathy is thought to result primarily from a blunted

---

The authors have nothing to disclose.

<sup>a</sup> Department of Physical Medicine and Rehabilitation, Baylor College of Medicine, University of Texas Health Science Center, 1 Baylor Plaza, Houston, TX 77030, USA; <sup>b</sup> Department of Physical Medicine and Rehabilitation and Orthopedic Surgery, Regenerative Sports Medicine, Baylor College of Medicine, 1 Baylor Plaza, Houston, TX 77030, USA

\* Corresponding author. Human Performance Center, 5959 West Loop South, Suite 260, Bellaire, TX 77401.

E-mail address: [john.cianca@hpchouston.com](mailto:john.cianca@hpchouston.com)

Phys Med Rehabil Clin N Am 28 (2017) 777–794

<http://dx.doi.org/10.1016/j.pmr.2017.06.010>

1047-9651/17/© 2017 Elsevier Inc. All rights reserved.

[pmr.theclinics.com](http://pmr.theclinics.com)

inflammatory response to tendonitis, leading to a degenerative cycle of abnormal healing.<sup>2</sup> Chronic repetitive tendon overload is the most commonly proposed theory, with high loads causing microscopic alterations at the cellular level that weaken the mechanical properties. Aging can result in progressive loss of mobility with subsequent deterioration in quality of life. A major component of this loss of mobility is progressive muscle weakness, as elderly muscles become smaller, more susceptible to damage, and regenerate and recover more slowly than in their youth.<sup>3</sup> Only recently has it been recognized that, in addition to skeletal muscle changes, alterations in tendon properties contribute to muscle weakness and loss of mobility in old age.<sup>3</sup>

### ***Rotator cuff tendinopathy***

Rotator cuff tendinopathy is the most common cause of shoulder pain in all age groups, accounting for 30% of shoulder related pain.<sup>4</sup> It arises from the repetitive strain incurred by overuse and poor postural control because the rotator cuff acts in its role as the primary dynamic stabilizer of the glenohumeral joint. Clinical features of rotator cuff tendinopathy include pain, crepitus, and increased pain with overhead activities of daily living. In a study done by Milgrom and colleagues,<sup>5</sup> the prevalence of RTC tears markedly increased after 50 years of age, with more than 50% of dominant shoulders in the seventh decade and 80% of subjects greater than 80 years of age. Riley and colleagues<sup>6</sup> demonstrated that the supraspinatus tendon undergoes a decrease in glycosaminoglycan, chondroitin sulfate and dermatan sulfate with age. In another study by Ruzdcki and colleagues,<sup>7</sup> regional variations in supraspinatus tendon vascularity were shown in an age-dependent manner. These results support that, even without clinical symptoms, the aging shoulder is likely to transition to attritional tendinopathy, perhaps making the shoulder more susceptible to injury.

### ***Gluteal tendinopathy***

Gluteal tendinopathy commonly presents as pain and tenderness laterally over the greater trochanter (lateral hip pain). It is a cause of moderate to severe pain and disability,<sup>8-11</sup> with 1 study demonstrating quality of life and levels of disability similar to those in end-stage hip osteoarthritis (OA).<sup>12</sup> Gluteal tendinopathy is most prevalent in women aged greater than 40 years<sup>13,14</sup> with reports of up to 23.5% of women and 8.5% of men between the ages of 50 and 79 years being afflicted with condition.<sup>14</sup> It is the most prevalent of all lower limb tendinopathies.<sup>15</sup> The mechanism leading to its development is multifactorial. Load shear strain, as mentioned, is a particular contributing factor. The influence of joint position affects compressive tendon loading from excessive hip adduction.<sup>16</sup> Patients with gluteal tendinopathy may experience pain after prolonged sitting, with subsequent difficulty in rising to standing, particularly if they have been sitting with more than 90° of hip flexion in a low lounge or car seat. Surrounding muscle architecture also plays a role in development of tendon pathology: the tensor fascia lata has been shown to hypertrophy<sup>17</sup> and gluteus medius and gluteus minimus atrophy<sup>18</sup> in those with gluteal tendon pathology. Bone morphology influences the compressive forces at the hip by vectors from the iliotibial band. The typical femoral neck angle of 128°, the iliotibial band exerted a compressive force of 656 N at the greater trochanter, but at 115° (coxa vara), the compressive force was 997 N.<sup>19</sup> These findings suggest that patients with more severe gluteal tendon pathology have lower femoral neck-shaft angles than pain-free controls or those with hip OA.

### ***Knee extensor mechanism tendinopathy***

Patellar tendinopathy, also referred to as jumpers knee, results from chronic tendon overuse and overload of the knee extensor mechanism. The most common location

Download English Version:

<https://daneshyari.com/en/article/5711453>

Download Persian Version:

<https://daneshyari.com/article/5711453>

[Daneshyari.com](https://daneshyari.com)