Paper #38

INFLUENCE OF AGING ON MICROVASCULAR SUPPLY OF THE GLUTEUS MEDIUS TENDON

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Summary: Influence of aging on microvascular supply of the gluteus medius tendon.

Introduction. Aging deeply influences several morphologic and functional features of the musculoskeletal structures. Previous studies have reported hypovascular zones in different tendons of the human body. However, there are no studies showing the relationship between aging and vascular supply of the gluteus medius tendon that may effect for increased vulnerability and healing potential.

Purpose. The purpose of this cadaveric study was to assess the relationship between age and microvascular supply of three areas of the gluteus medius tendon utilizing a previously validated CD31 immunohistochemistry staining technique.

Methods. Twenty-four fresh-frozen gluteus medius specimens were obtained through a postererolateral approach to the hip. The average age of donors was 47.3 years (range, 18 to 68 years). Each sample was divided in three portions (musculotendinous -MT, tendinous –T, and tendon-bone junction -TB). Hematoxilin&Eosin was utilized for qualitative structural analysis and then all samples were stained with CD31 immunohistochemistry for quantitative vessels per square millimeter. The comparison of the microvessel density between zones according to age was performed using an Analysis of Variance. To evaluate the relationship between microvessel supply and age a regression model with curvilinear estimation was used. Data were fitted to a quadratic model.

Results. Vascular supply in transversal and longitudinal cuts regardless of the zone were 53.9 (±32.1) vessels per mm and 51.1 (±19.3) vessels per mm2 on average, respectively. Vascular supply of the gluteus medius increases from young age, reaches a maximum value (vertex) at middle age, and then decreases constantly after. All the areas of the tendon showed a good strength of relationship (R) between age and vascular supply ranging from 0.41 to 0.75. Additionally, the proportion of vascular supply change explained by the age (R2) was significant in most of the cases, ranging from 0.17 to 0.56 (p values <0.05).

Conclusion. There is a strong chronological relationship between aging and microvascular supply of the gluteus medius tendon, where an initial increasing of the vasculature occurs from young age, reaching the maximum vascular supply at middle age, and then showing a significant and maximum reduction at old age. This finding may have implications for increased vulnerability and decreased healing potential.