

Is there a relationship between wedging of the small tarsal bones and osteoarthritis of the associated joints?

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Introduction: Osteoarthritis (OA) of the tarsus is common in horses and it has been suggested that wedging of the central (CTB) and third (TTB) tarsal bones may be a risk factor for developing this disorder. The aim of this study was to investigate the relationship between tarsal bone conformation and osteoarthritis of the tarsus. We hypothesised that an increase in wedging of the third and central tarsal bone will be associated with an increase in severity of osteoarthritis in the adjacent joints.

Materials and Methods: Computed tomographic (CT) images were acquired from 45 cadaver tarsi from a random sample of skeletally mature horses euthanased for unrelated reasons. The height of the CTB and TTB was measured at the most dorsal aspect and plantar aspect in three sagittal planes: lateral sagittal (LS) plane, mid-sagittal plane and medial sagittal (MS) plane. A “wedging index” was calculated as the ratio between the dorsal and plantar measurements. All CTs were graded 0-3 for signs of OA. A Kruskal Wallis test was performed to assess the differences between horses with different grades of OA and Kendall’s tau correlations were calculated between wedging index and degree of OA.

Results: There was a moderate negative significant correlation between wedging index of the CTB in the mid-sagittal plane and degree of OA in the TMT joint ($\tau = -0.24$, $P=0.04$) and DIT joint ($\tau = -0.27$, $P=0.02$). The mean (\pm SD) wedging index of the CTB in the mid-sagittal plane decreased significantly with increased OA grade 0-1 in the PIT joint.

There was a significant difference between the wedging index of the TTB in the mid-sagittal plane ($P= 0.04$) and MS plane ($P= 0.01$), for tarsi with different OA grade in the TMT joint. The wedging index decreased with increasing OA grades 0-2, however grade 3 cases showed a significantly increased wedging index. The same trend was seen in the DIT joint. No significant relationship was seen for the wedging index of the TTB related to grade of OA in the PIT joint.

Conclusions: Our study suggests that wedging of the small tarsal bones is associated with OA in the associated joints. Care should be taken in foals to prevent the development of this wedging and later corrective farriery should aim to reduce uneven loading of the tarsus.

Bibliography:

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