

Role of Talar Concavity in the Development of Ankle Joint Osteoarthritis after Malleolar Fractures

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Aim. Evaluation of the role of talar concavity as a risk factor for post-traumatic ankle joint osteoarthritis.

Methods. The talus quotient (Q) was determined by a radio-morphometric method, and used to describe the characteristics of the individual form of the talus (superficial, deep) with regard to age and gender in 364 patients. In 179 patients previously treated for malleolar fractures, talus Q was assessed for its involvement in the development of osteoarthritis. Length of the fibular malleolus and ankle mortise width were measured using a radio-morphometric method. Radiographs of the healthy and the injured ankle were compared in each patient.

Results. Deep talus quotient (Q) was equally distributed between genders, while the superficial form of the talus was more frequent in younger patients ($p < 0.05$). The most frequent characteristics associated with osteoarthritis were female gender ($p < 0.05$) and advanced age ($p < 0.00001$). Shortened fibular malleolus ($p < 0.001$), widened ankle mortise ($p < 0.01$), and closed treatment of type B fractures by the Weber classification ($p < 0.05$), were significantly associated with osteoarthritis after malleolar fractures. Control examinations revealed that deep talus Q accompanied by a shorter fibula ($p < 0.05$) and widened ankle mortise ($p < 0.05$) was involved in the development of ankle joint osteoarthritis after malleolar fractures. Talus Q change was found to result from bone shifts that caused widening of the ankle mortise ($p < 0.05$).

Conclusion. Determination of the depth of talar concavity does not help in the evaluation of the risk of ankle joint osteoarthritis, except in the cases of shorter fibula and widened ankle mortise. Short fibular malleolus, wide ankle mortise and closed treatment of type B fractures are the risk factors for osteoarthritis after malleolar fractures.

Key words: ankle joint; biomechanics; osteoarthritis