

Publication

A comparison of subchondral bone mineralization between the glenoid cavity and the humeral head on 57 cadaverous shoulder joints

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PURPOSE: Mineralization distribution of the subchondral bone plate can be used as a marker for long-term stress distribution in diarthrodial joints. Severe injuries or pathological changes of the glenohumeral joint often end in osteoarthritis, where shoulder arthroplasty has become the treatment of choice. The computed tomography osteoabsorptiometry (CT-OAM) is a non-invasive method to determine the distribution of the mineralization of the subchondral bone plate in vivo, which is an important factor concerning the implantation of orthopedic endoprotheses. The aim of this study was to investigate the mineralization of both joint partners of the glenohumeral joint and to compare them with each other. **METHODS:** The distribution of the mineralization of the subchondral bone plate of 57 shoulder specimens was determined by means of CT-OAM. To evaluate a correlation between age and localization of subchondral mineralization maxima, the Chi-square test correlation test was applied. **RESULTS:** Forty-nine glenoid cavities (86 %) showed a bicentric mineralization distribution pattern with anterior and posterior maxima, only 8 glenoid cavities (14 %) revealed a monocentric mineralization pattern with anterior maxima. Forty-five humeral heads (79 %) showed a bicentric distribution pattern with anterior and posterior maxima, 12 humeral heads (21 %) could be classified as monocentric with a centro-posterior pronounced maximum. **CONCLUSIONS:** We could demonstrate that stress distribution in both joint partners of the glenohumeral joint is inhomogeneous and characteristically bicentric due to the physiological incongruity. Monocentric mineralization patterns can result as a cause of age-related loss of incongruity.

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