

**TOPOGRAPHIC BONE DENSITY OF HUMERAL HEAD**

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**Purpose:** We aimed to provide an anatomical basis for surgical techniques in rotator cuff reinsertion. The purpose of this study was to investigate the 3-dimensional trabecular bone mineral density (BMD) in the humeral head bone and determine areas of low density. Limited information exists for humeral head to understand its mechanical behaviour.

**Materials and Methods:** 15 unpaired fresh human humeral heads were harvested and frozen : ten humeral head from female and five from male. The mean age was 75 years old .All abnormal bones underlying fractures, major arthrosis or surgical interventions were excluded from the study. This one was approved by ethic commission. All the heads were scanned using a three-dimensional HR-pQCT system providing 80 microns slices nominal resolution. Manually outlining of the contours of cancellous bone was done in different areas: lesser tuberosity, greater tuberosity, articular part and centre. The parameters included in the analysis were: bone volume density (BV/TV, Trabecular thickness (tb Th) (mm),Trabecular separation(TB.Sp)(mm),Trabecular number(TB.N.) (1/mm).

**Results:** The average density of the lesser tuberosity is the highest of the whole head (BV/TV= 0,228 ). The centre of the head is devoided of large trabeculae with a very low density (BV/TV =0,1). The greater tuberosity is rich in thin trabeculae ( Tb Th = 0,265) separated by large spaces ( 1,5) .The articular part presents the higher density ( BV/TV =0,3 ) .

**Conclusions:** Emphasis has traditionally been placed on cortical bone as quality predictor due to its stiffness for achieving primary stabilisation .However screws and anchors are mainly in contact with cancellous part of bone, and mechanical characteristics of cancellous bone also influence the load-bearing capacity of implant -bone union This studies is interesting in showing areas of poor cancellous bone quality and may help to improve surgical techniques.