

There are two basic ways of surgical treatment of femoral neck fracture - total endoprosthesis or a special metal screw in the bone. In case of a dense enough bone the screws are preferred. But for a too parse bone, the screw may cut through the femoral head, which results in further surgical operations. We present a novel method for femoral head density measurement, which serves as another hint for the doctor's decision, whether to apply a screw or total endoprosthesis. Our approach is based on semi-automatocal femoral head segmentation from CT dataset based on finding optimal path through polar coordinates on axial slices. The cost function is based on a combination of corticallis properties, mostly the directional behavior of 3D gradients and their size in 2D slices, where they form typical "channels". The final volume is computed using filling and morphological algorithms and its properties are further measured. The final implementation was experimentally validated on RTG clinic of Bulovka hospital and allows radiologists to intuitively and accurately estimate the femoral head density in approximately 1 to 3 minutes.