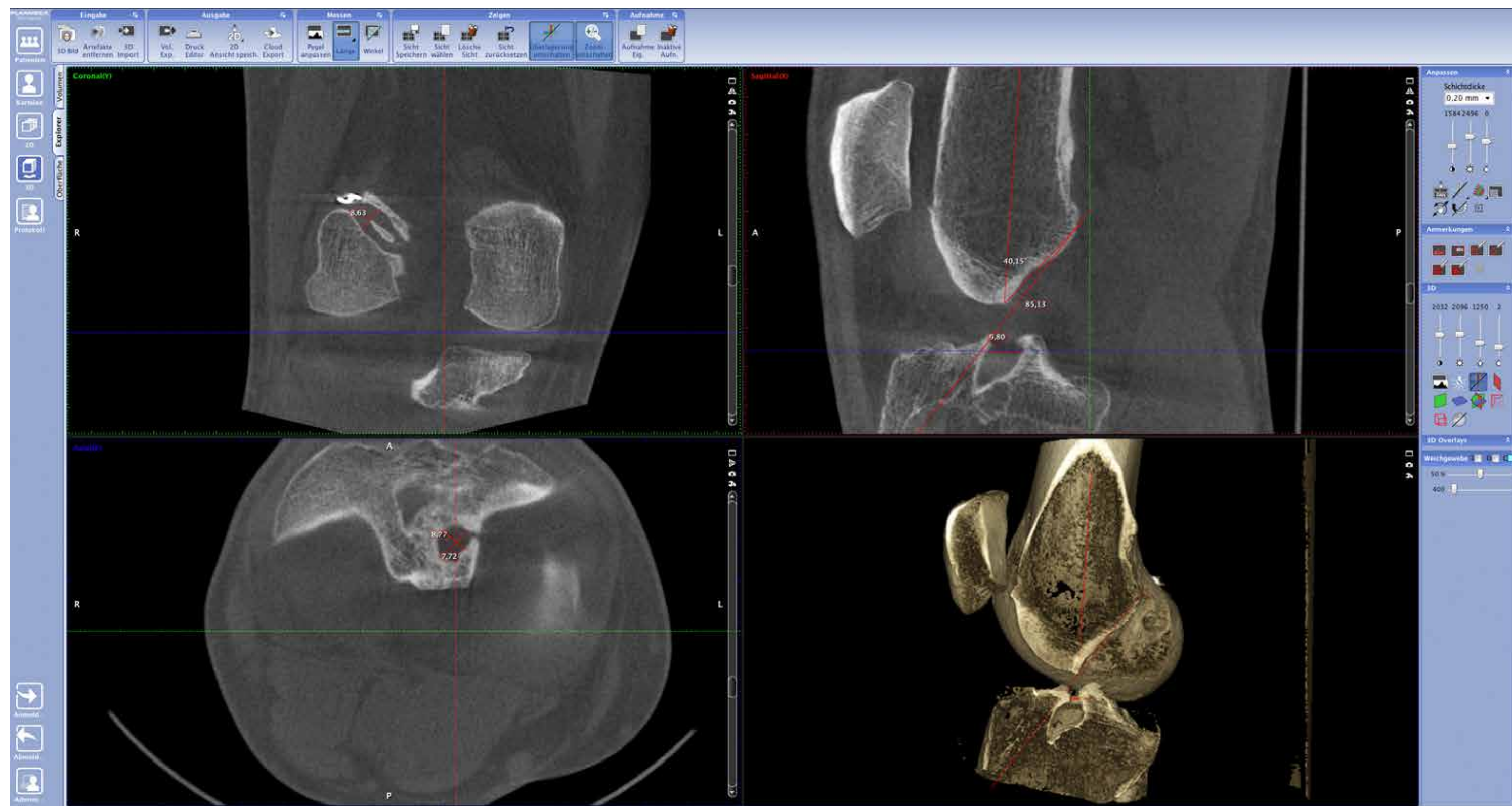
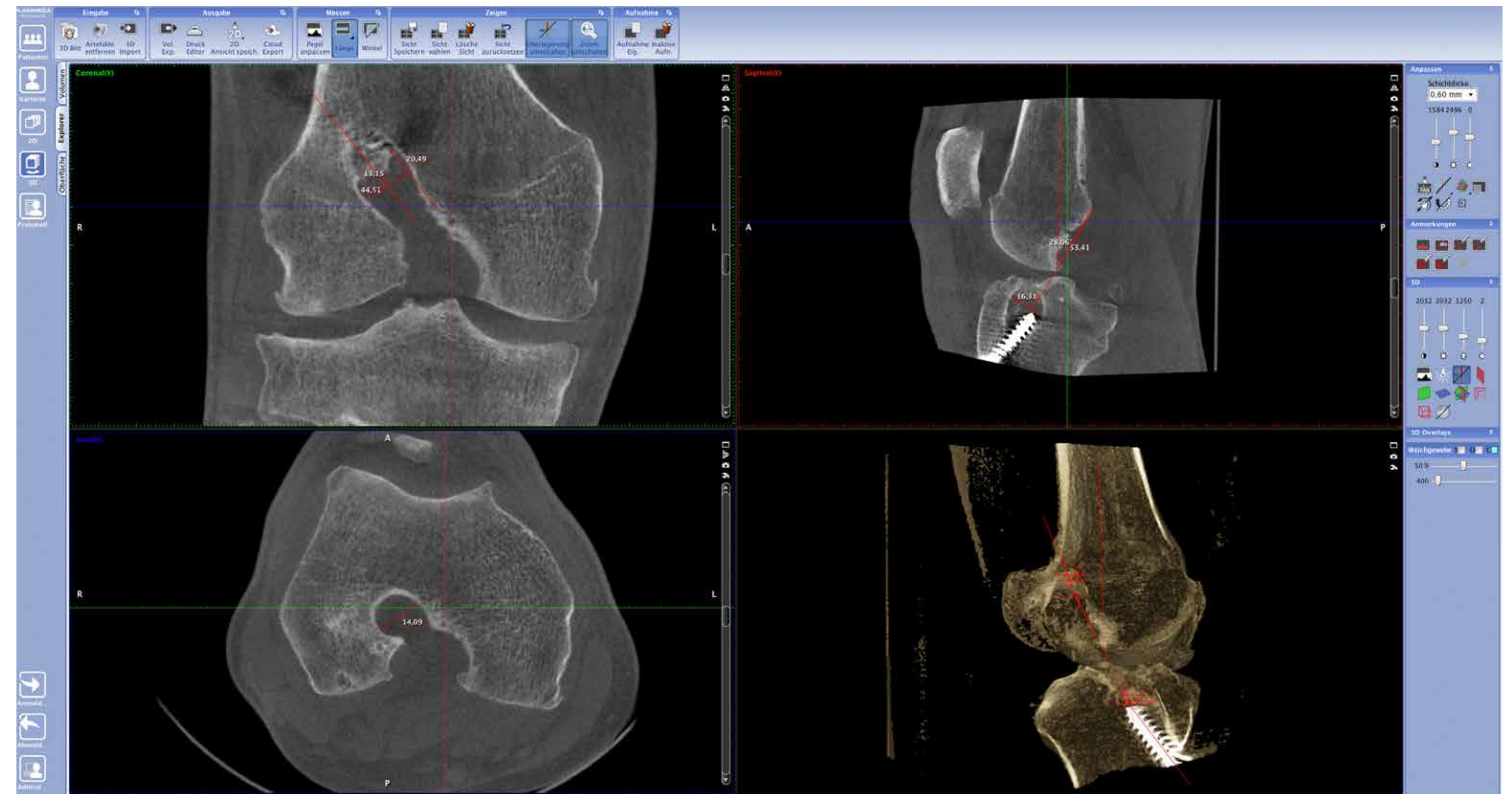


The cone beam CT (CBCT) is a new three-dimensional kind of radiation. Circularly an extended amount of projected pictures are performed. Instantaneously a three-dimensional volume of the examined organ is calculated. In application the three-dimensional x-ray beam in combination with a two-dimensional picture receptor the CBCT demarks from the classical (one line) CT and reaches a reduction of radiation exposure of about 50% compared to a classical CT. The physician gets an ultra high solution imaging of the osseous structures in several seconds.

In ACL revision one of the most important factors is the position and the shape of the drill tunnels (width, depth, breath) and if the tunnels are filled up with bone. These factors determine, whether there is an one step revision possible or a two step revision necessary. The preoperative planning is mostly performed with the CT analysis. With the CBCT this can be performed more exactly, in a shorter time and with less exposure of radiation.



34 year old patient, male, ACL reconstruction with STG Tendon double channel technique and screw fixation, resorbable screws tibial, washer fixation femoral in 2009, no graft impingement by Howell and Taylor, maximal tunnel width tibial 9 x 7 mm and 7 x 7 mm, femoral intercondylar 8 mm, notch width and height index by Souryal is regular, no tunnel enlargement, one step revision possible.

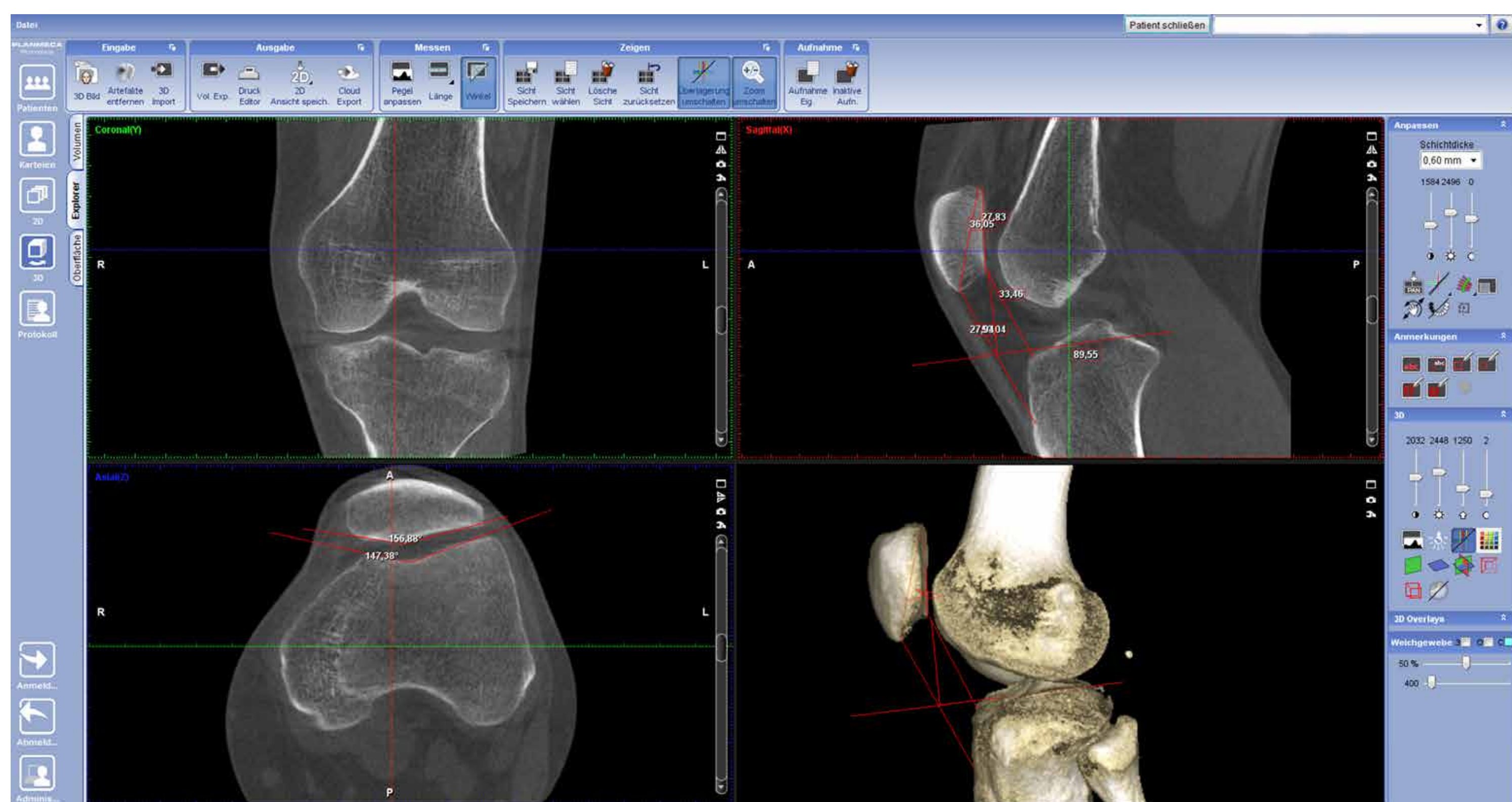


44 year old patient, male, ACL reconstruction with BTB transplant and screw fixation 1994, CBCT: Graft impingement by Howell and Taylor Grad III, maximal tunnel width tibial 16 x 14 mm, femoral 20 x 14 mm, tunnel enlargement tibial more than femoral, two step revision necessary.

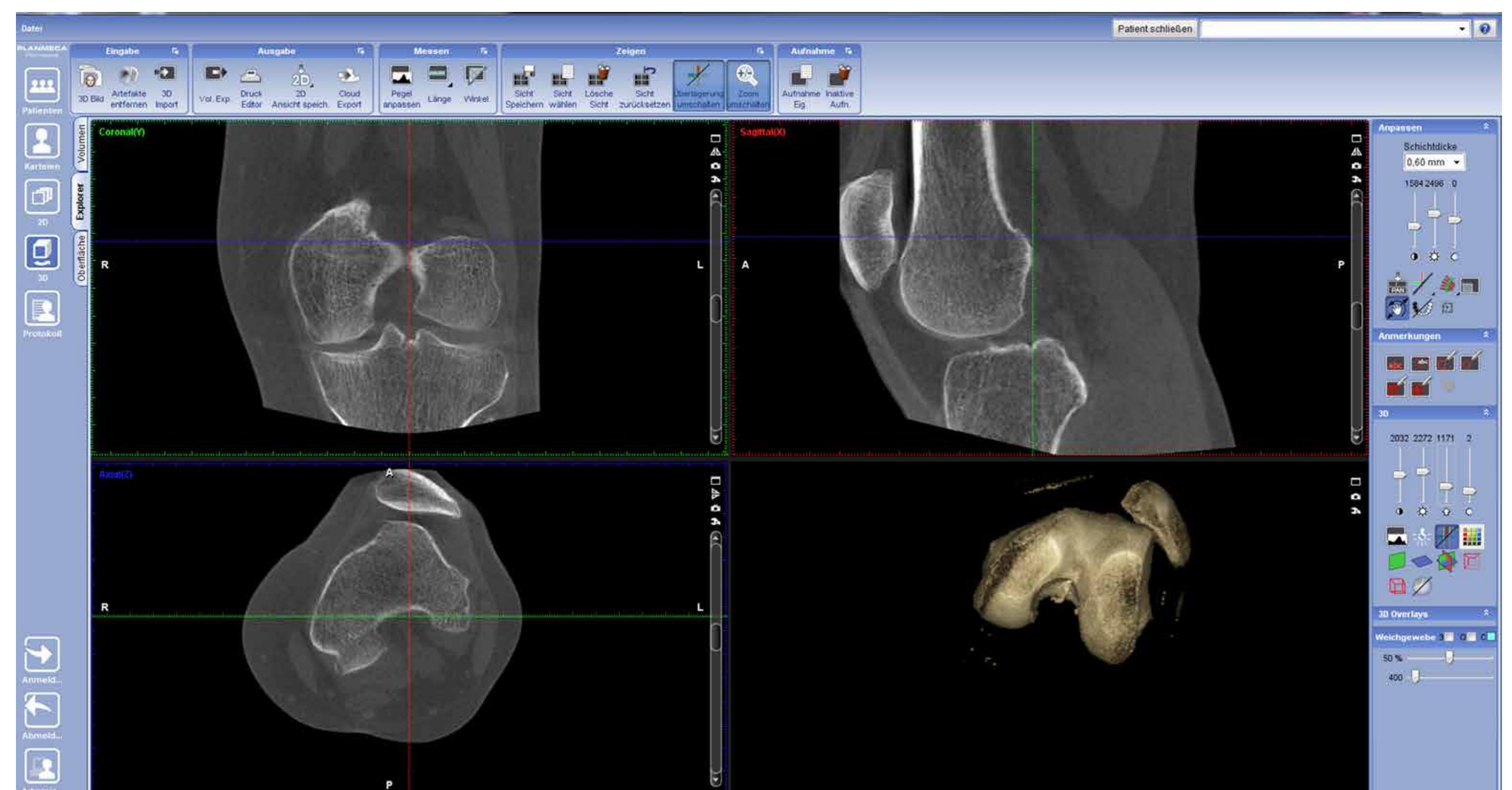
For the three-dimensional analysis of the patellofemoral tracking in weight bearing 30° degree position with the cone beam CT, (CBCT) the gantry can be turned horizontally and the patient can stand in a functional 30° position during the analysis. The stabilization of the patella is a combined procedure. Leading beneath the muscular structures and the ligamentous stabilization are the configurations of the osseous structures. Mostly the conventional diagnosis is the anamnesis, the examination and the x-ray diagnosis in ap, 30° in side position and the patella tangential view. In most cases a CT is necessary for the correct diagnosis. All these radiological diagnoses include no functional analysis. A special analysis in weight bearing position in 30° degrees of flexion can only be performed in special institutions. With the cone beam CT (CBCT) the weight bearing view and analysis can be performed anywhere and reduces the radiation exposure (about 80%).



Weight-bearing imaging. SCS MedSeries® 3D Imaging H22



The patella height Indices, p. e. by Insall and Salvati, Blackburne and Peel, or Caton – Deschamps, the types of patella dysplasia by p. e. Wiberg and Baumgartl, the types of trochlea dysplasia, p. e. by Hepp, the width of the articular surface of the trochlea, the patella, the angle of the intercondylar sulcus or the merchant an angle can be measured directly, the measurement of the TTTG between Tuberositas tibia and Trochlea can be performed in the weight bearing position in the three dimensional reconstruction.



48 year old patient, female, in 30° weight bearing position, patella alta, patella dysplasia, trochlea dysplasia, extreme patella instability and lateralisation.