

Reprinted from
International Congress Series No. 547
4th EUROPEAN CONGRESS ON ULTRASONICS IN MEDICINE
Dubrovnik-Cavtat, Yugoslavia
May 17-24, 1981
Editor: V. Latin
Excerpta Medica, Amsterdam-Oxford-Princeton
ISBN Excerpta Medica 90 219 1246 5
ISBN Elsevier/North-Holland 0 444 90200 7

68. Ultrasound evaluation of fetal femur and humerus throughout gestation

P. PAPARELLA, P. GENTILI and C. GIORLANDINO, Rome, Italy

An increasingly accurate study of the fetal anatomy has permitted us to identify and measure the fetal long bones. 1732 measurements of the fetal femur and 1588 measurements of the fetal humerus from the 14th to the 40th week of gestation have been recorded by real-time ultrasound. Within the context of the limbs, the femur and the humerus show up as echo-rich segments. The measurement is made on the section in which the beam of ultrasound falls perpendicular to the axis of the bone. The average weekly values, with the relative standard deviations, were calculated. Furthermore, the theoretical growth of the femur appeared as the function $y = -146,225 + 60,500 \ln x$ ($r^2 = 0.965$) and for the humerus as $y = -119,973 + 50,697 \ln x$ ($r^2 = 0.962$). At the level of the distal epiphysis of the fetal femur an echo-rich area has also been identified and can be referred to as the distal centre of ossification of the fetal femur. This centre, recognizable from the 32nd week of pregnancy, is comparable to the degree of fetal lung maturity. The utilization of the growth curves of the femur and of the humerus allows: (a) the identification in utero of cases of dwarfism; (b) the correct evaluation of cases of reduced fetal growth; (c) the evaluation of the exact date of death of the fetus in the uterus.