SUMMARY

The hip joint is a unique joint in structure and function . Although it sustains the stresses of supporting body weight, it retains a wide range of motion in three perpendicular plans with the greatest degree of stability .

The functional anatomy of the hip joint was discussed as well as its kinematics . The seven degrees of freedom of motion, namely , flexion , extension , abduction , external rotation , internal rotation and circumlocution were studied as regards range of motion and factors affecting it was well as the role of different muscles of the hip region in control of such movements . The phenomena of inversion of muscular action around the hip and the successive recruitment of different muscle of this region was also discussed .

The loads and stresses to which the normal hip joint is subjected were as regards their types , effects on the skeleton and their different components . The external forces to which the hip is subjected and the moments they generate were listed including the body weight force , the abductor force and the foot floor reaction force . The joint contact forces were also discussed.

The physiological stresses to which the hip joint is subjects as a result of forces applied to it is also mentioned as well as its magnitude, distribution, factors affecting it and physiological adaptation of the trabecular pattern to it .

The hip joints is famous for its stability and is believed by some to be the most stable joint of the body . This stability is achieved by

virtue of many factors, muscular role and ligamentous and capsular support the hip joint .

The stabilization of the hip and pelvis to accommodate for different movements and postures to be adopted is also of great importance .

Most disease of the hip joint involve the disturbance of the physiological balance of kinetics and kinematics around this complex joint . This disturbance may be either the primary etiological factor of the disease or a secondary consequence to it . In both condition , it is of extreme importance to understand such a disturbance in the biomechanics of the hip joint , its consequences and the means of correction of such a disturbance .

The biomechanical aspects of total hip arthroplasty are a wide and complex subject . The pincioals of these biomechanical aspects are discussed here as regards the anatomical alteration of positioning of different components and alteration of their designs . The biomechanical results of alteration of acetabular placement, displacement of the greater trochanter , the femoral offset and valgus varus orientation of the femoral component of total hip replacement is discussed. Types of acetabular components and their modes of fixation as well as effects of change of the femoral head size were also discussed .