Introduction

Great advances have been made in producing joint replacements which clearly improve function in adults. Similar advances have been made in childhood, however pediatric orthopedics has remained a somewhat conservative field and only recently has it been suggested that joint realignment procedures be performed even in moderate deformities to prolong joint durability and function. Current epidemiologic data suggests that children born in the year 2000 are likely to live to age 90 years and beyond. The number of adults reaching 100 years of age is skyrocketing each year. Accordingly we have begun to adjust our intervention in children’s musculoskeletal conditions with a goal of maintaining the child’s own biologic tissues for a lifelong journey.

Disorders of the Hip

As Harris and others have noted, a high percentage of hip arthritis occurs in adults who had prior childhood hip conditions. Aggressive athletic activity in adult life has also worsened the prognosis for patients with these pre-existing conditions. Many of these patients will require a total hip replacement by age 40 years.

We are now more vigorous in providing joint realignment strategies for hip abnormalities in childhood. Common causes of premature hip deterioration include developmental hip dysplasia (DDH), slipped capital femoral epiphysis (SCFE), and Legg-Calve-Perthes disease (LCPD). This talk will focus on intervention to normalize hip anatomy in developmental dysplasia of the hip. Similar principals apply in treatment of the other disorders noted above.

As a resident we were taught that one should avoid operating on a hip unless a child was having pain. As a result of long-term follow-up studies, this conservative viewpoint has changed and we currently advise surgical correction of hip dysplasia in early childhood, ideally before age six years. The development of modern acetabular osteotomies, which can be performed predictably and safely, has allowed this change. Our goal is to have a radiographically normal hip by age six years. Operations performed up to age ten provide excellent results, whereas procedures performed in the teenage years have a less predictable outcome.

Acetabular Osteotomies in Adolescents and Young Adults

Procedures such as the Salter and Pemberton osteotomies are best performed in childhood. Choices in the teenage years include triple innominate osteotomy and the Bernese periacetabular osteotomy (Ganz). The advantages of the Ganz procedure include that one can reorient and redirect the acetabulum, yet provide secure osteotomy fixation so that a postoperative hip spica cast is not needed. Accordingly patients up to age 40 years can have acetabular realignment procedures which forestall the need for total hip replacement. Ideal candidates do not have significant femoral head deformity and have a relatively congruent joint, but have significant acetabular dysplasia.

Femoral-Acetabular Impingement

Ganz has also introduced the concept of hip impingement as a cause of premature hip arthritis. Causes include SCFE, LCPD, and the “idiopathic lack of offset” hip (likely subclinical SCFE). Surgical correction of the impingement (open or via arthroscopy) can extend the life of such hips.
Alignment Below the Hip Joint

Some types of hip disease develop alignment problems below the knee and these are becoming better understood. For example, a patient with significant functional varus at the hip due to childhood hip disease will predictably develop valgus at the knee. New strategies, including guided growth using an epiphyseal tether, allow correction of the knee deformity (performed at the same time the hip is corrected).

Alignment Below the Hip

Previously children with a genu valgum of up to 20 degrees were allowed to continue into adult life with their deformity. Similarly severe flatfoot was rarely treated surgically. Modern surgical procedures allow correction of genu valgum with simple outpatient procedures and flatfoot can be corrected with multi-bone osteotomies that allow anatomic alignment. Each of these procedures pose minimal risk to the child. Progressive orthopedists propose that this approach prepares the child for the highest level of function over a long lifetime, perhaps to age 100 years. Pragmatists state that such care is expensive and that its cost-benefit ratio has not been clarified.

Bibliography