Congenital Dislocation of the Hip in Black Patients

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SUMMARY

Congenital dislocation of the hip is virtually unknown in Black people, and 3 cases of congenital dislocation of the hip in Black patients are presented.

In an attempt to explain the difference in the racial incidence of this condition, the three most commonly cited aetiological factors were examined. We are unable to confirm that postnatal nursing habits, differences in joint laxity or the absence of acetabular dysplasia can explain the extremely low incidence of this condition in South African Blacks.

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Congenital dislocation of the hip does not occur in the South African Blacks,[1] the New Zealand Maoris[2] or in the West Indians.[3]

Edelstein[1] examined 16 678 Black neonates for congenital dislocation of the hip. Using the 'Ortolani' sign as the criterion, he found only two suspicious cases which were unconfirmed by subsequent radiological examination. There would be about 70 cases in Edinburgh from such a population of neonates.[4]

We examined 4 500 consecutively born Black neonates for congenital anomalies. One 'clunking' hip was found, and subsequent radiological examinations confirmed congenital dislocation of the right hip (Fig. 1).

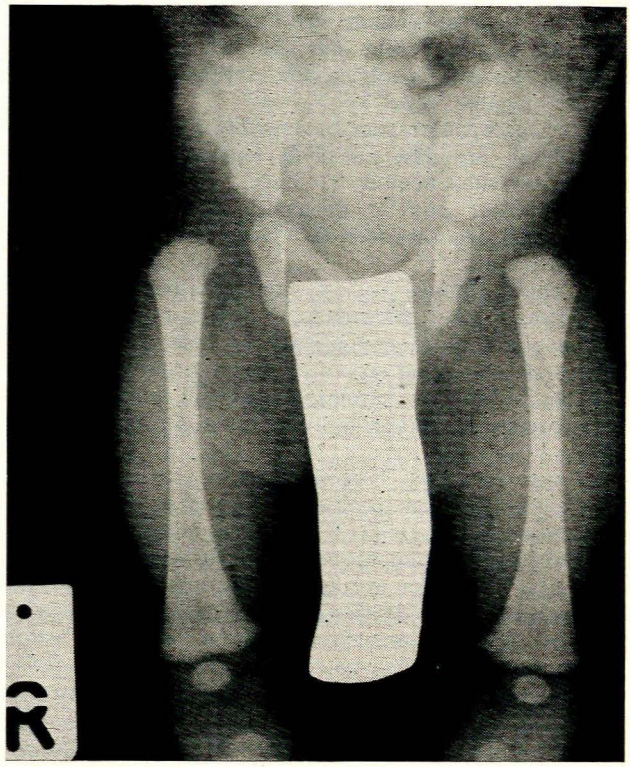

Fig. 1. Radiograph taken in neonatal period demonstrating congenital dislocation of the right hip.

PATIENTS

The first patient was a 3,8-kg male infant—otherwise normal—the fifth child of a 36-year-old Xhosa mother, having been delivered as a persistent breech. The mother stated that the other children were all normal. The hip reduced easily and was treated by means of a plaster hip spica with the hips flexed and abducted. The reduction has remained concentric and the hip is developing normally (Fig. 2).

Two further cases of congenital dislocation of the hip in Blacks were treated during the past year. Both were female patients with unilateral dislocations.

One presented at 3 months of age when her mother became concerned about the asymmetry of her legs. The patient had been born at home and careful questioning failed to reveal information concerning any abnormality during the pregnancy or delivery. Reduction was easily accomplished and was maintained in a hip spica.

The other case presented at the age of 4 years 6 months with an obvious limp. The obstetric history was non-contributory, and the patient had 5 normal siblings. Examination revealed a shortened thigh with an obviously dislocated right hip. Roentgenograms confirmed a high dislocation of the right hip and demonstrated subluxation and dysplasia of the left hip (Fig. 3).

This case was treated by preliminary traction for 5 weeks, followed by open reduction, plication of the redundant capsule and innominate pelvic osteotomy by the Salter technique.[5] The result would seem to be good as the right hip has remained reduced and stable (Fig. 4). An innominate osteotomy will be carried out on the left-hand side in order to correct the acetabular dysplasia.

Careful questioning showed that all 3 patients were apparently of pure Black extraction. In a further effort to

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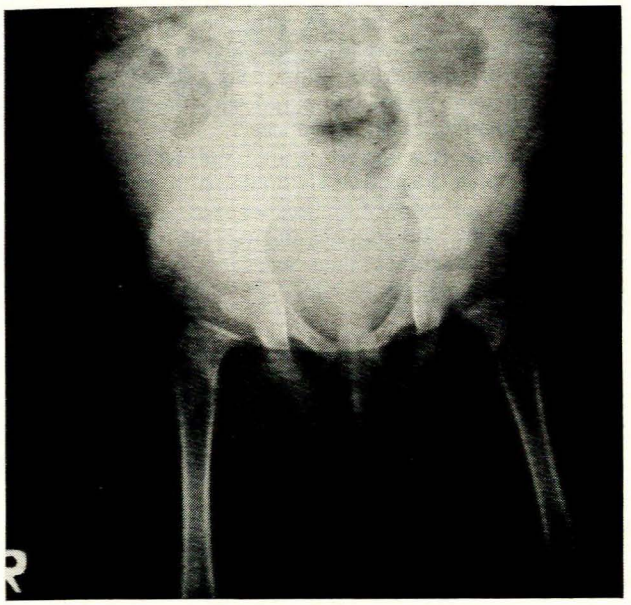

Fig. 2. Radiograph taken 8 months later demonstrating concentric reduction of the right hip.

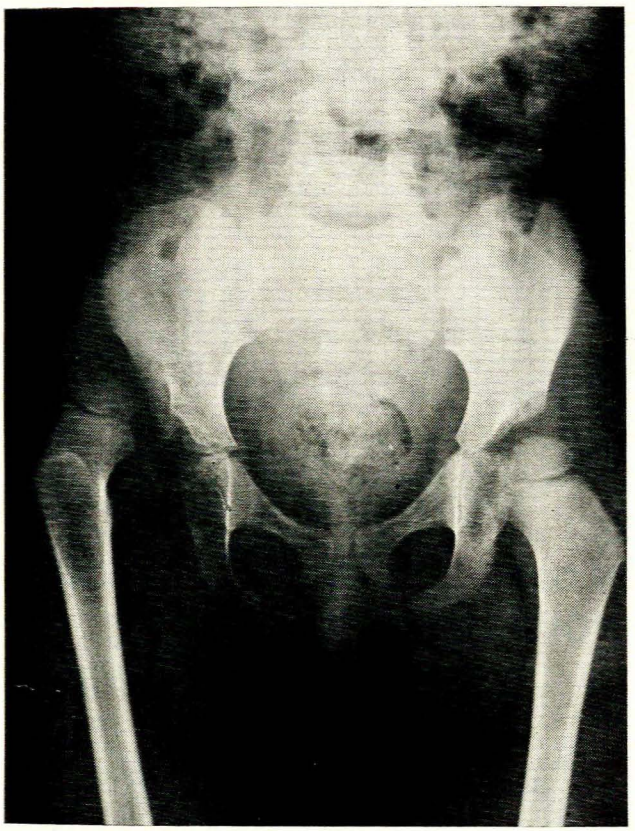

Fig. 3. Radiograph demonstrating obvious dislocation of the right hip. In addition, subluxation and acetabular dysplasia is present on the left side.

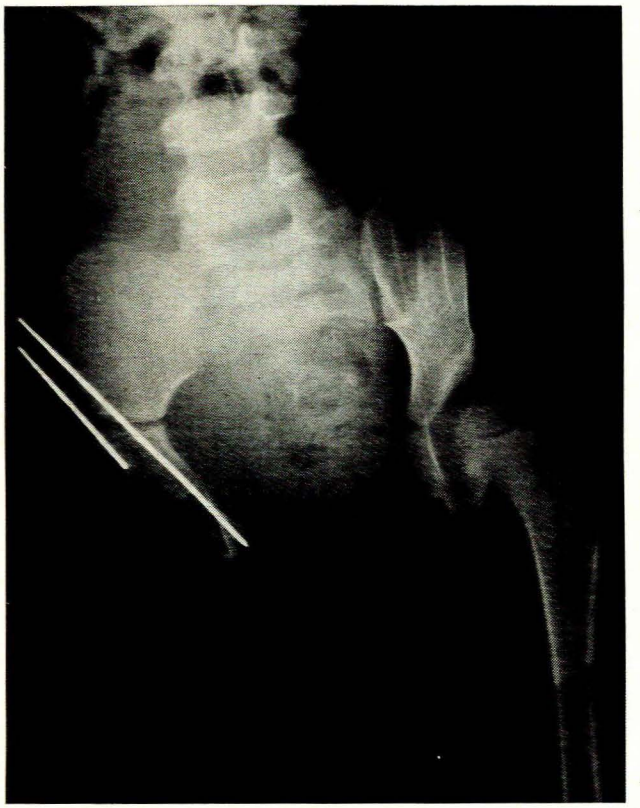

Fig. 4. Radiograph taken 6 weeks after open reduction and Salter innominate osteotomy of the right hip.

ascertain their ethnic origin, 2 of our 3 patients had 'gene marker' studies done by the Human Sero-Genetic Unit of the South African Institute for Medical Research in Johannesburg. The investigation of 17 red cell antigen and red cell enzyme genetic systems failed to reveal any allele which might suggest White admixture. All other pathology known to be associated with dislocated hips has been carefully investigated and excluded in all 3 patients.

Perusal of the literature revealed only one further description of congenital dislocation of the hip in Black twins.[6]

Although individual cases have been mentioned by a number of South African surgeons, one is never certain that these cases were of pure Black extraction.

POSTNATAL NURSING HABITS

It has been suggested that the habit of carrying the infant astride the back (with abducted and flexed hips) corrects a potential dislocation in the neonate.[7] This may be significant but does not account for the failure to find positive 'Ortolani' signs in the neonates.

It is not usually the custom of Blacks, however, to carry their infants in this fashion during the critical first 6 weeks of life; each mother we questioned stated that she wrapped her infant tightly in a blanket during the first 6 - 8 weeks:

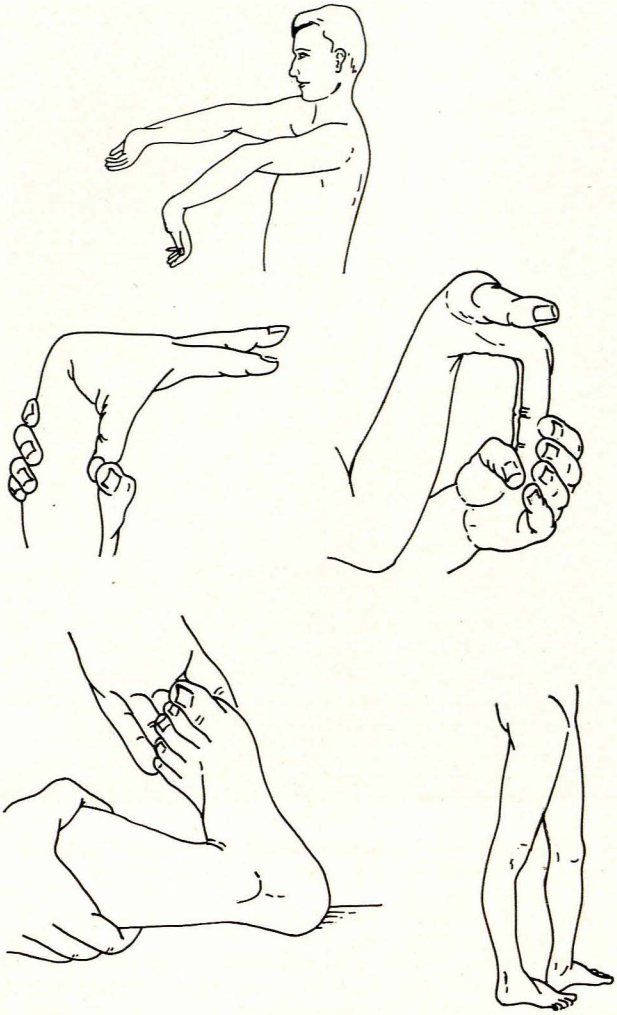

Fig. 5. The amount of joint laxity regarded as excessive—elbows and knees extended beyond 180° by 10°, the thumb touching the forearm on flexing the wrist, the fingers parallel to the forearm on extending the wrist, and metacarpophalangeal joints and the foot dorsiflexed to 45° or more. Joint laxity was considered excessive if 3 of the 5 pairs of joints examined showed this degree of laxity.

in this situation, the hips are held in the unstable position of adduction and extension. This custom would thus not seem to be of importance in protecting such infants against the development of congenital dislocation of the hip.

Two aetiological factors in congenital dislocation of the hip recently suggested are familial joint laxity and acetabular dysplasia.[4] We studied these factors in a normal Black population and compared them with normal controls in a population in which congenital dislocation of the hip is commonly found.

JOINT LAXITY

Joint laxity has been implicated in the genesis of congenital hip dislocation.[8-10] Ruth Wynne-Davies[4] found that a higher proportion of children with congenital dislocation were lax-jointed. In addition, a higher proportion of neonates with dislocated hips and their first-degree relatives had joint laxity, compared with the late diagnosis group of congenital dislocation cases.

Joint mobility is a graded trait, considerable variation being possible in normal individuals. It is maximal at 2 years of age and rapidly diminishes during childhood.[11-13] No children are lax-jointed during the first week of life,[14] and factors other than age are significant at the 5% level under 2 years of age.[4]

BLOEMFONTEIN STUDY

A total of 471 normal Black children, predominantly South Sotho in origin, between 2 and 13 years of age, who were attending creches and schools in Bloemfontein, were examined for undue laxity of peripheral joints, using the technique described by Carter and Wilkinson.[9] Joint laxity was considered excessive when more than three of the five tests were positive (Fig. 5).

RESULTS

We found a greater range of movement at all ages when compared with the Edinburgh series of Wynne-Davies,[4] using the same criteria. At 2 years, 68% were hypermobile, declining to 25% at 6 years and 5% at 12 years, as compared with corresponding Edinburgh figures of 50%, 5%, and 1% (Fig. 6).

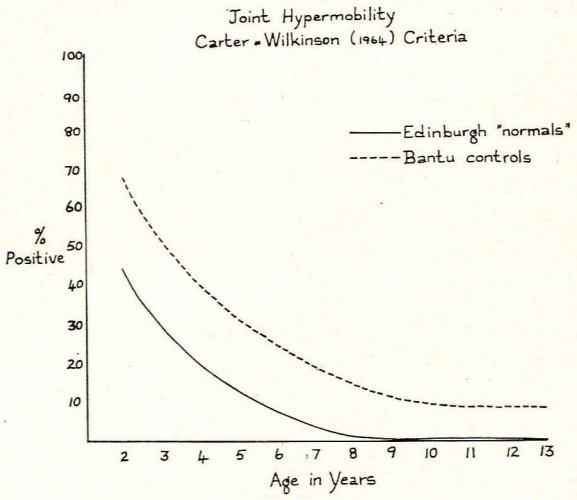

Fig. 6. This graph shows that normal Black children exhibit a greater percentage of individuals that are positive for undue joint mobility when compared with normal White children studied in Edinburgh.[4]

Blacks and Indians have previously been shown to have a greater range of movement than Whites for the same age and sex.[15,16]

We further compared our group with a study of the Tswana tribe,[13] using an assessment of joint mobility on the 0 - 9 scale as described by Beighton and Horan.[17] Good correlation was found, with an even greater degree of joint mobility in the younger age cohorts in our group (Fig. 7).

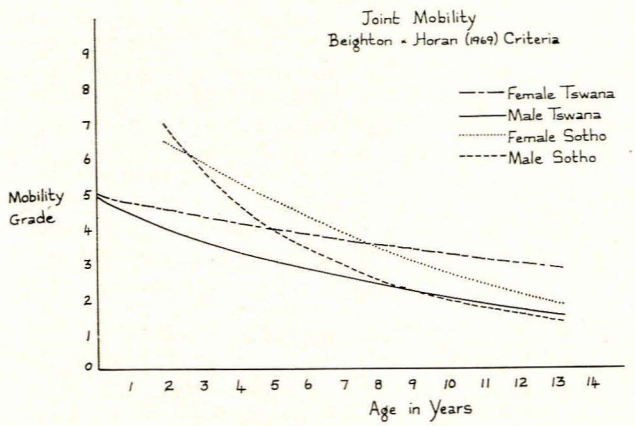

Fig. 7. This graph shows good correlation of joint mobility scores of Sotho children examined in Bloemfontein when compared with Tswana children examined by Beighton *et al.*[13]

ACETABULAR DYSPLASIA

Ruth Wynne-Davies[4] stated that acetabular dysplasia is probably a true primary condition of multiple gene inheritance responsible for a high proportion of congenital hip dislocation cases diagnosed late (after 4 weeks of life).

In a further attempt to explain the difference in racial incidence, a series of 156 radiographs, taken for reasons unrelated to hip disease, was obtained from the Radiology Department of the Pelonomi Hospital. A total of 302 centre-edge angle[18] measurements were made (Fig. 8).

After the necessary allowance had been made for age, sex and side, no statistically significant difference could be found (Fig. 9).

Blacks tend to have less deepening of the acetabulum with increasing age. Wynne-Davies[4] attributes the deepening of the acetabulum with age to the development of osteo-arthroses. It would seem from this study that Blacks are less prone to development of osteo-arthrosis of the hip—supporting our experience that osteo-arthrosis of the hip joint is rarely a clinical problem in Blacks. This was recently confirmed by Solomon, using the same criteria as suggested by Kellgren and Lawrence.[19] Solomon found an incidence of significant osteo-arthrosis of approximately 3,5% in Blacks compared with 14% in Whites over the age of 55 years.[20]

It should be pointed out that virtually any causes of hip joint dysfunction during the growth period will produce secondary acetabular dysplasia.

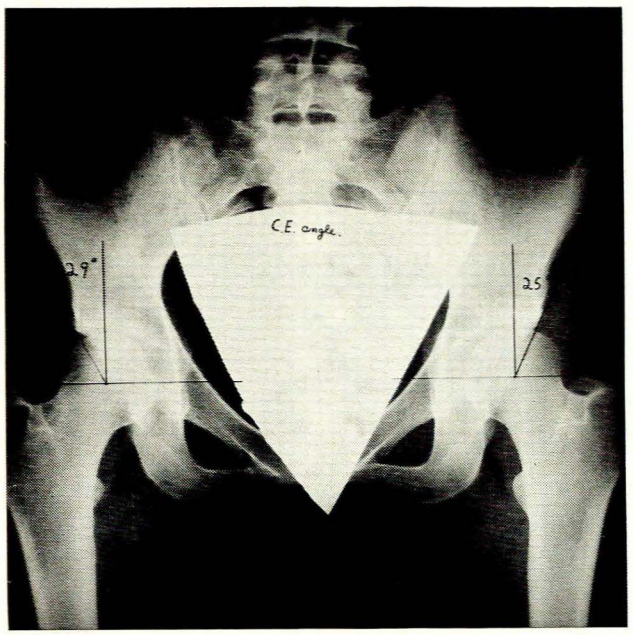

Fig. 8. Radiographic demonstration of the centre-edge angle measured by the Wiberg[18] technique.

CONCLUSION

The concept (as proposed by Wynne-Davies)[4] that acetabular dysplasia is a 'true primary condition' predisposing to congenital dislocation of the hip is questionable; and more so when the centre-edge angles measured in an adult population are taken as an indication of this true primary condition.

However, the absence of acetabular dysplasia as a racial characteristic is not a factor which protects Blacks against the development of congenital dislocation of the hip.

Blacks have a greater degree of joint mobility, yet congenital dislocation of the hip is virtually absent. Our study failed to establish a positive correlation between loose-jointedness and congenital dislocation of the hip.

Thieme *et al.*[14] found hypermobility in terms of easy abduction of the hips past 90° in the frog position, in 6% of neonates examined. However, not one of the 21 congenital dislocated hips discovered during this survey showed such a degree of hip laxity.

Racial difference in articular mobility cannot explain the differences in incidence of congenital dislocation of the hip.

ADDENDUM

Since submitting this article for publication, a further case of unilateral congenital dislocation of the hip in a Black girl aged 2 years 6 months has been seen.

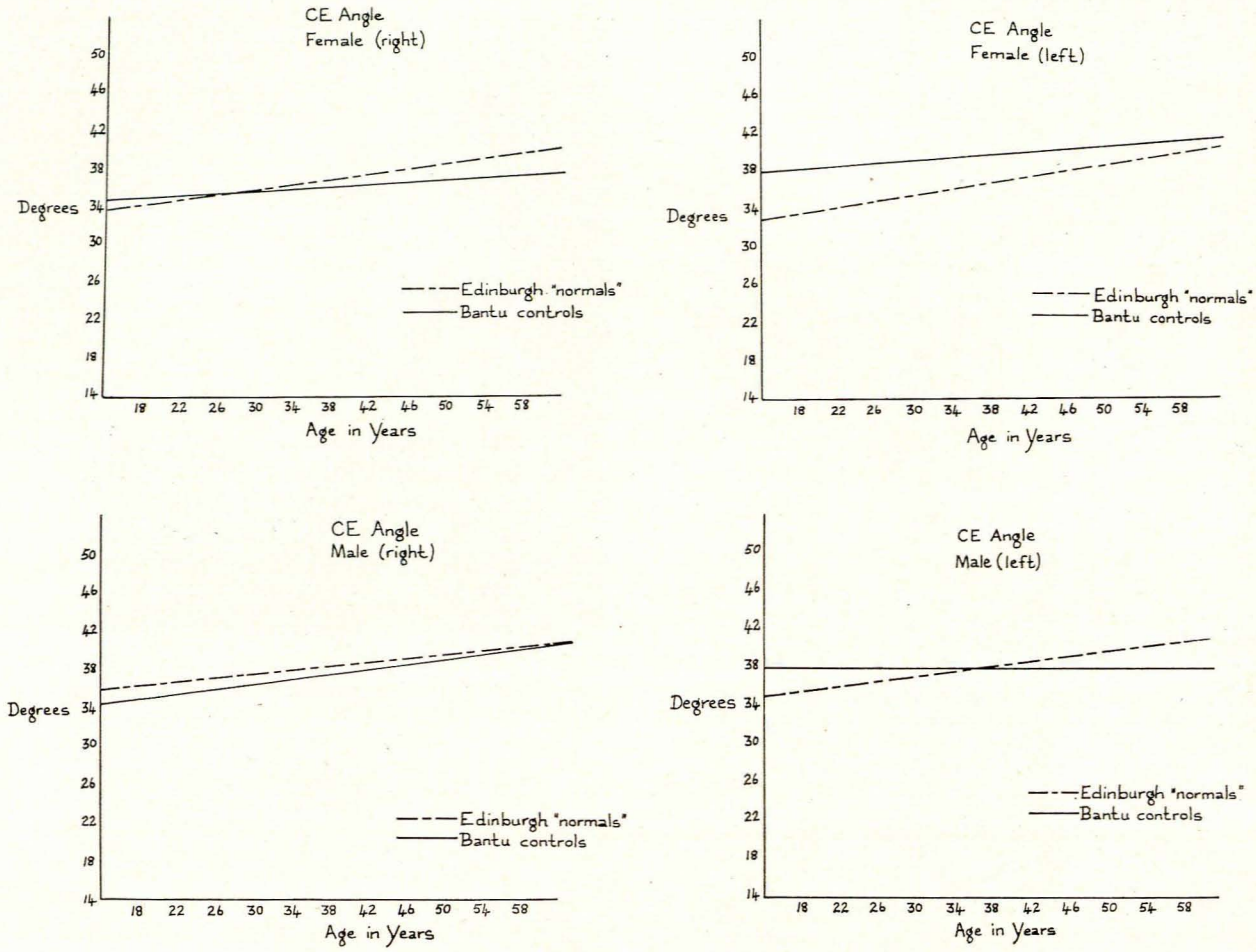

Fig. 9. Statistically insignificant differences in the centre-edge (CE) angles of hips of Blacks when compared with the centre-edge angles of normal Whites, as measured in Edinburgh. Note that the centre-edge angle increases gradually throughout adult life in the Edinburgh series but much less so in the Black series. (Centre-edge angles of Edinburgh 'normals' by kind permission of Ruth Wynne-Davies.)

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