Developmental Dysplasia of the Hip

Developmental dysplasia of the hip (DDH) is an abnormal formation of the hip joint in which the acetabulum and femoral head are misaligned. This condition has also been called congenital dislocation of the hip, but DDH is a more fully comprehensive term that emphasizes both the congenital and acquired aspects of the progressive condition, which may or may not manifest as a complete dislocation until later in development (Fig. 1). DDH results in distinctive skeletal changes that would have severely impacted the lifestyle of an afflicted individual in ancient times.

Case 1: M22 (10220)

These are the nearly complete remains of an adolescent female about 15-16 years old at time of death. The right hip has a narrow, shallow opening at the true acetabulum (as compared to the contralateral side) and associated with this, an irregular and flattened right femoral head (Fig. 4).

Case 2: M3 (20030)

These are the nearly complete remains an adult female who died in her early 40s. The left hip has a false acetabulum superior to the true joint. Associated with this condition, the left femoral head is somewhat flattened in shape, with an indistinct fovea capitis, and the anterior surface is enlarged and lipped (Fig. 5). Likewise, the right femoral neck is robust, possibly owing to increased weight borne on the right caused by the left hip displacement.

Other pathological conditions include moderate expression of healed cribra orbitalia and antemortem loss of LM1 and RM1. The vertebrae also display some age and activity related changes, with slight to moderate vertebral osteophytosis of thoracic vertebrae and the sacral S1 surface, and Schmorl’s nodes that appear on the inferior surface of T4 that get progressively larger down toward T8 (the lowest preserved thoracic vertebra).

Prevalence

The modern incidence has been reported between 10-20 per 1,000 live births, with a bilateral condition in more than half of those affected, and left side more common when it is unilateral. However, the recent incidence has been known to range from 4.4 to 52 percent because of varied diagnosis. There appears to be geographic variation in the distribution of DDH, suggesting genetic and environmental influences (Tab. 1). Major high risk factors are listed in Table 2.

Methods: Diagnosing DDH

Doctor Eng performed osteological analysis using protocols recommended by the Global History of Health Project to obtain data on health status, including evidence of pathological conditions. There was a minimum of 162 individuals, with 68 people who had at least one portion of a hip joint present for observation (that is, either an acetabulum or femoral head). Of those 68, subadults younger than 15 years old accounted for 30 cases, and among the 38 adults, there were 24 adults.

In Bobald, there was a very large sample of hip joints for observation, likely a factor of sampling during excavation. The incidence of 2.9 percent in the total sample, or 5.3 percent of adults is comparable with some modern populations, and not as high as found in others (Tab. 1). While there is no significant difference between male and female frequencies in this small sample (Fishier’s Exact Test, P=0.499), it is noteworthy that the only cases of DDH are found in females of this collection.

Effect on Lifestyle

DDH left untreated may predispose an individual to early degenerative hip arthritis because of altered load on bones. Not only is gait impaired, but DDH may also cause considerable pain, and this may limit activities, possibly to the detriment of the individuals affected and their families.

Conclusion

To date, 30% of the cemetery has been excavated and future excavations may yield more observations of hips within this population, which will give a more accurate representation of the prevalence of DDH. Current evidence suggests that the frequency of DDH found in the Bobald collection is comparable to those found in many modern groups, but the lack of medical treatment may have meant that DDH was detrimental to maintaining a stable livelihood during the period in which these two afflicted female villagers lived.

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Literature Cited