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Risk Factors, Epidemiology and Common Presentations and Complications of Slipped Capital Femoral Epiphysis

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Mini Review

Slipped capital femoral epiphysis (SCFE) occurs when the metaphysis of the neck of femur is displaced antero-superiorly while the epiphysis remains in the acetabulum, most common presentations are hip, groin or knee pain, a limp and fixed external rotation [1]. SCFE is considered one of the most frequent hip disorders with an incidence of 0.33 up to 24.58 per 100,000 children from ages 8 to 15, with an average of 12.0 years old for boys and 11.2 years old for females, it varies with different racial and ethnic frequency with 1.0 for Caucasians, blacks at 3.9, and 2.5 for Hispanics , the average onset of symptoms is 4 to 5 months [2], Latency in the diagnosis of SCFE is found to be related to poor prognosis, it also increases degree of slippage as the disease is not detected in the pre-slip phase, patients with referred pain and patients with stable slips are more prone to be misdiagnosed, hence the delay of the diagnosis [3]. As the international epidemic of childhood obesity continues to grow, an increasing number of children are developing SCFE [4]. According to a study conducted over the last 20 years in Scotland, a close association was observed between rising childhood obesity and an increase in the incidence of SCFE [5]. Moreover, an epidemiological study of SCFE in Sweden showed a mild increase for girls over the years 2007-2013, However, it also showed that overweight or obesity was one major characteristic for boys with SCFE but to a lesser extent for girls [6].

Although the etiology of SCFE is not yet clear, it's known to be correlated with endocrine disorders [7]. It was found that the prevalence of SCFE is increased in children who have hypothyroidism, who are receiving growth hormone supplementation, or who have hypogonadism [8-9]. Additionally, it is found that patients with SCFE associated with hypothyroidism are commonly obese or overweighed, but a persistent hypothyroidism may be a risk factor itself for SCFE, even without obesity [10]. The management of SCFE is still controversial and the management differs in case of stable or unstable slips, a survey was sent to 287 members of the European Pediatric Orthopedic Society (EPOS) ,where only 72 participated , 90 percent of the respondents agreed upon not performing a reduction in case of a stable slip, however there was a controversy in the way of managing unstable slips ,(46% by positioning, while 35% would manage by manipulation ,and only 11% went with open reduction [11]. Moreover, to understand how obesity increases the risk of SCFE, we have to fully comprehend the mechanism in which the injury occurs. It is well known that this type of deformity is caused by an increase in the force applied through the epiphysis, or a decrease in the resistance of the physis itself to shearing. This type of deforming mechanics occurs mainly in the hypertrophic zone of the growth plate. For that reason, other risk factors such as coxa profunda, which is a deeply seated acetabular socket, and femoral or acetabular retroversion can lean to an increase incidence of SCFE [12]. The most common complain associated with SCFE is hip pain. This pain is usually aggravated by physical activities such as running, jumping and pivoting motion of the hip joint. Chronologically, slipped capital femoral epiphysis can be subdivided into three main types: acute, acute on top of chronic, and chronic. The most common presentation of SCFE in the acute phase is severe hip pain that can radiate to the groin area or around the ipsilateral knee. In addition, limited range of motion mainly in hip abduction and internal rotation. While in the acute on top of chronic, patients tend to have an altered gait and moderate pain.

In the chronic SCFE, patients are able to walk with slight pain on top of mild to moderate shortening of the affected leg and atrophy of the thigh muscles. Other classifications were introduced to further highlight certain types of SCFE, the most well-known was proposed by Loder et al. [13] and it is based on the physeal stability [13]. This stability is judged based on the ability to walk on the affected leg with or without crutches. Loder

et al emphasized that this distinction is very important as the prognosis and treatment will vary based on it. Other literature has further elaborated on the stability in relation to radiographic signs including clear separation between the head and metaphysis, absence of the metaphyseal remodeling and incidental reduction of the slip angle by more than 10 degrees during surgery [14]. Complications of SCFE can vary from persistent hip pain, limp and impingement to osteonecrosis of the femoral head. By far, osteonecrosis is considered the most devastating complication to such patients. In a study conducted by Larson et al, Osteonecrosis was found to be the most common reason for hip arthroplasty in patient with SCFE [15]. Although, long-term studies have shown that excellent functional outcome can be expected until fifth decade if the hip can be stabilized without the occurrence of osteonecrosis [16].

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