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Case Report

The "Cone-Head" sign: Magnetic resonance image findings of the "Headspin Hole", an overuse injury found in breakdancers

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ABSTRACT

Breakdancing can cause the formation of a painless lump on the scalp at the vertex of the skull, with associated hair loss called a "Headspin Hole." This occurs secondary to chronic inflammation from performing spinning dance moves on the head. We present the radiological findings of the "Headspin Hole" in a 38-year-old male with a history of breakdancing. Magnetic resonance imaging revealed a cone-shaped deformity on the vertex of the skull with deep scalp thickening adjacent to the outer-table cortex. Currently in the literature, there is no description of the radiological findings of this cone-shaped deformity on the vertex of the skull, we refer to this as the "Cone-Head Sign."

Introduction

Breakdancing consists of various elaborate dance moves that include spins, flips, balances, freezes, and contortions, which require considerable agility as well as coordination in order to execute. Some maneuvers even require the dancer to spin on the apex of their head, a move called "The windmill" [1]. Due to the complex nature of these dance moves, this makes breakdancers highly susceptible to injury. These include (in order of decreasing frequency) the wrist, finger, knee, shoulder, lumbar spine, elbow, cervical spine, ankle, foot, and hip [2]. Most commonly, injuries include sprains, strains, and tendinitis. Other less frequent injuries include fractures, dislocations, and bursitis [2,3]. Injuries to the brain and skull may occur as well. Case reports have mentioned instances of alopecia as well as more serious injuries such as subdural hematoma formation [4,5].

Chronic injuries in breakdancing have been classified as part of a "breakdancer overuse syndrome," which involves the following: carpal tunnel syndrome, tenosynovitis, impingement syndrome, painless chronic lumps on the back and head, chronic loss of hair, and chronic irritation of the head due to headspins [6]. A type of overuse syndrome specific to the

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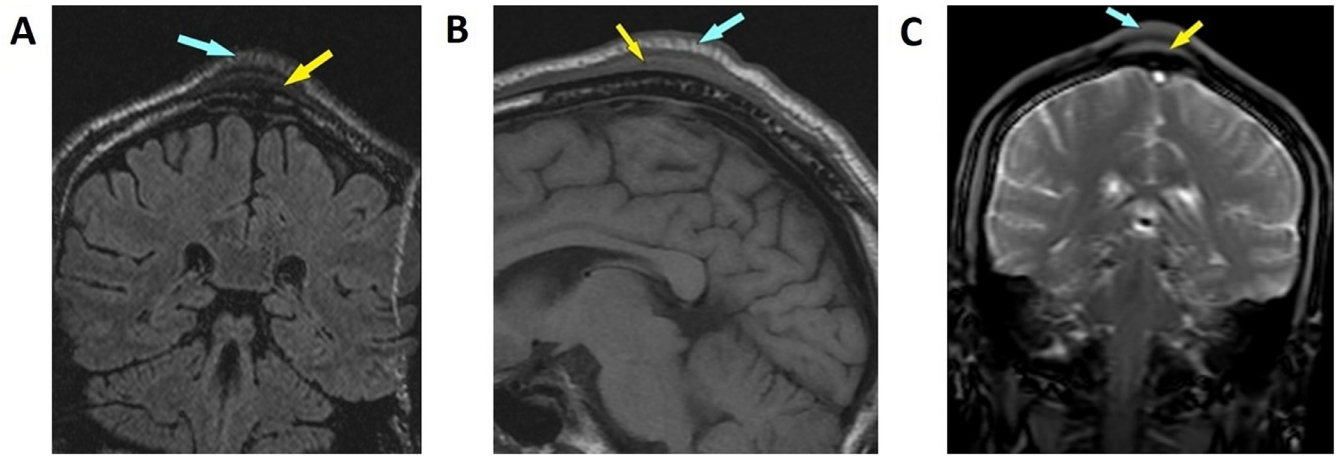

Fig. 1 – (A) T1 MRI Midline Coronal and (B) T1 MRI Midline sagittal shows hypertrophy of the epicranial aponeurosis and connective tissue as well as hypertrophy of subcutaneous fibroadipose tissue at the vertex abutting the outer table cortex. The enlargement of the epicranial connective tissue is noted as the intermediate isointensity (yellow arrow) that is consistent with scarred and fibrotic tissue. The enlargement of the subcutaneous fibroadipose tissue is noted as the high intensity (blue arrow). (C) T2 MRI Midline Coronal Brain shows subcutaneous fibroadipose tissue noted to be low intensity (blue arrow). (Color version of figure is available online.)

scalp due to spinning on top of the head has been termed the "Headspin hole." This syndrome is a combination of hair loss, inflammation, loss of sensation, and the formation of a lump. The radiological findings of a "Headspin Hole" have not been described in the literature to our knowledge. Here we present a case along with the magnetic resonance image (MRI) findings.

Case report

A 38-year old man had presented for MRI of the brain due to a new onset of dizziness; the patient also had concurrent nosebleeds which had been present for the past few years. The MRI was performed using a 3.0 Tesla MR signa HDxt system (G.E. Healthcare Milwaukee, WI) scanner utilizing standard MRI sequences at a 4 mm slice thickness. Imaging demonstrated deep scalp thickening measuring approximately 8.0 × 2.5 × 0.5 mm (Anterior-Posterior, Transverse, and Cranial-Caudal) adjacent to the outer-table of the skull, of which is consistent with scarring or callus formation (Fig. 1). The Cranial-Caudal measurement was greatest at the vertex and then markedly thinned out peripherally, giving the appearance of a cone-shaped deformity. Signal intensity was homogenously isointense on T1 and T2, no areas of decreased signal to suggest calcifications on coronal gradient imaging. The underlying calvarium was intact and normal. Contrasted imaging was not performed and axial imaging was limited due to slice selection, slice thickness, and technical artifact.

Pertinent history included breakdancing since the age of 15, and the execution of moves that included spinning on the top of the head. He had previously used to spin on his head with a helmet, but more commonly used just a baseball hat or skull cap. The patient also reported a chronic palpable lump in the vertex region with associated loss of hair and sensation which was seen on physical examination of the patient (Fig. 2). The patients reported occasional remote episodes of dizziness following these maneuvers which would spontaneously resolve. At 6 month follow-up, clinical visit demonstrated resolution of the nosebleeds and dizziness, which were of uncertain etiology.

Discussion

The "Headspin Hole" has only been described to be found exclusively in breakdancers. A survey of 106 breakdancers found that 42 had experienced some inflammation in the area of the scalp, 25 had a painless thickening, 33 had hair loss, and 42 had reported none of these findings. Overall 64 of the respondents had stated that they had suffered from overuse of the scalp due to spinning on their head [7]. No MRI findings or imaging features have been reported.

There is however a case report of an 18-year-old male who presented with a soft-tissue mass posterior to the 12th thoracic vertebrae. The patient had been breakdancing the preceding 6 months prior to presenting for evaluation of the mass. He had been regularly executing spinning moves on the area where the soft-tissue mass had formed. In this case, histologic examination was performed which had showed that the mass was consistent with reactive fibrosis and adventitial bursitis [8]. We hypothesize that there would be similar findings in a case of "headspin hole" due to the similar mechanism of injury.

Fig. 2 – Physical findings of "Headspin Hole" include paucity hair and palpable lump on the scalp.

Conclusion

The "Headspin Hole" is an overuse syndrome that is found commonly in breakdancers due performing spinning dance moves on the scalp. This may lead to inflammation, hair loss, loss of sensation, and the formation of a lump. The lump may be seen on MRI as deep scalp thickening adjacent to the outer table of the vertex of the skull and have a cone-shaped appearance of which the finding may be referred to as "Cone-Head Sign". Radiologists and clinicians should be aware of the clinical presentation and radiologic findings to avoid unnecessary biopsy and/or other inappropriate work-up.

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