右足舟状骨疲労骨折を罹患した大学女子中距離ランナーの障害発生機序について
－身体機能評価データと歩行並びに走動作評価をもとに－

中畑敏秀[1)]，上田敏斗美[2)]，松村勲[3)]，瓜田吉久[3)]
[1)]医療法人恒心会小倉記念病院
[2)]TOTO 株式会社
[3)]鹿屋体育大学

キーワード：右舟状骨疲労骨折，走動作，障害発生機序

【要 旨】

本研究は、右足舟状骨疲労骨折を罹患し偽関節を呈した 18 歳の大学女子陸上競技中距離選手に着目し、身体機能評価や歩行並びに走動作評価から障害発生機序の推察を行った実践事例である。この選手の主訴は、走行時の右足舟状骨部の荷重時痛であった。この疼痛は、走行開始時に VAS3 で、約 30 分経過すると VAS8 まで増強していた。そのため、大学入学後の上半期のシーズンは一度もレースに出場する事ができなかった。そこで、大学 1 年次の 10 月に整形外科受診を行い、12 月に骨接合術を施行することになった。術前に行った身体機能評価では、足舟状骨部に圧痛が見られ、股関節の可動域制限の左右差やタイトネス、全身関節弛緩性が確認された。また、静的アライメント評価では腰椎前彎や骨盤前傾位を呈し、股関節屈曲内旋位、右膝外反位、足部距骨過回内位で偏平足であった。さらに、動的アライメント評価は骨盤部のトレンデレンブルグ現象や遊脚側への回旋、Knee-in が確認された。高校 3 年時の走動作評価では、“腰が引けた姿勢”“離地期に足が流れる”“上半身が揺れる”動きが特徴として観察され、術前の歩行評価では腰椎と骨盤の回転運動が増強していた。これらの身体機能評価と歩行並びに走動作評価を統合すると、右足舟状骨疲労骨折に至った背景には、股関節可動域の左右差や股関節周囲筋のタイトネスに伴う可動域制限、関節弛緩性による動作の切り返し不良、静的並びに動的アライメント不良の問題が浮かびあがった。このことが、走動作に非効率性をもたらし足舟状骨に対して圧縮力・離開力・剪断力という 3 つの機械的ストレスを繰り返し与え、障害に至ったと推察された。

スポーツパフォーマンス研究，3，122-137，2011 年，受付日：2011 年 2 月 21 日，受理日：2011 年 9 月 30 日
責任著者：中畑敏秀 〒893-0023 鹿児島県鹿屋市笠之原町7318－1 おぐらリハビリテーション病院
riha-riha@koshinkai.or.jp

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Cause of the fracture of the right navicular bone of a female university student middle-distance runner: physical function data and evaluation of her motions when walking and running

Toshihide Nakahata[1)], Satomi Uetat[2)], Isao Matsumura[3)], Yoshihisa Urita[3)]
[1)] Medical Corporation Koshinkai, Ogura Memorial Hospital
[2)] TOTO Ltd

[3] National Institute of Fitness and Sports in Kanoya

Key Words: right navicular bone fracture, running motion, mechanism of bone failure

[Abstract]

The present study describes the case of an 18-year-old female university middle-distance runner who had a fracture of her right navicular bone. A mechanism for the failure is suggested, based on an assessment of her physical function and walking and running motions. The student's initial complaint was pain when a load was put on her right navicular bone when running. The pain was reported to be VAS3 at the start of running, increasing to VAS8 by 30 minutes later. For that reason, the student could not participate in any races in the first half of the season after her admission to the university. She had an orthopedic consultation in October of her freshman year, and, as a result, an osteosynthesis operation was done in December. The physical function assessment performed before the surgery found oppressive pain in the area of the navicular bone, and confirmed a right-left difference and tightness in her hip joint, which resulted in movement restrictions, as well as whole body joint flaccidity. In addition, a static alignment assessment found a lumber flexure and front inclination of her pelvis, flexural internal rotations in her hip joint, valgus knee on the right side, an over-pronated position of her ankle bone, and flat feet. Furthermore, dynamic alignment assessment confirmed the presence of Trendelenburg symptoms, and found that her pelvis tended to swing toward the free-side leg and that she was knock-kneed. In an evaluation of her running motion when she was a high school senior, reported features of her motions included a posture in which her back was bent so that her posterior protruded, extension of her knee when lifting her foot, and swaying of her upper body. In a walking evaluation before her surgery, the rotational movement of her pelvis and lumbar spine was found to be enhanced. On the basis of an integration of those assessments of her physical function and her walking and running motions, causes of the stress fracture of her right navicular bone were thought to include the right-left difference and the tightness of the movable area of her hip joint, insufficient turning motions due to arthrochalasis, and poor static and dynamic alignments. These problems led to inefficiencies in her running motions, resulting in the three repeated mechanical stresses to the navicular bone of compressing, opening, and shearing, which then caused the bone's failure.