Clinical Implication of Os subfibulare: Analysis of Pediatric Ankle Inversion Injury in a Primary Care Unit

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Introduction/Purpose: Os subfibulare, defined as a separated ossicle of the distal fibular, has been linked to various clinical problems such as subfibulare pain and chronic lateral ankle instability. However, whether os subfibulare is congenital or traumatic remains unclear. The objectives of this study were: 1) to determine the incidence of os subfibulare development after ankle sprain in children and adolescents in a single primary care orthopedic clinic, and 2) to evaluate clinical implication of os subfibulare associated with ankle sprain in children and adolescents.

Methods: Among 896 pediatric patients (age ranging from 3 to 16 years) who visited a single primary care unit after sustaining ankle inversion injury, 627 patients who were followed up for over 2 weeks were included in this study. For each pediatric patient, physical examination and radiographic examination (anteroposterior, lateral, and mortise view of the bilateral ankle) were performed. The incidence of os subfibulare was evaluated based on initial radiographic examination. To analyze the incidence of new os subfibulare formation after ankle inversion injury, radiographs of 193 patients who were followed up for more than 6 months were evaluated according to the grade of injury.

Results: At initial visit, 1% of examined ankles (13 from 1,254 ankles of 627 patients) showed well corticated ossicle not related to initial injuries. We cannot recognize the existence of accessory ossification center of the fibula in our study population. Overall incidence of os subfibulare at final follow up after ankle inversion injury was 23.9% (150/627). Os subfibulare at final follow up was correlated with initial injury grade (OR: 8.0, p = 0.001). In patients with initial avulsion fragment, 64.9% (61/94 cases) had residual ossicle at the final radiograph after being followed up for more than 6 months. As for the morphology of ossicle, 54 cases with wafer bone fragment at the time of initial injury showed oval or round shape ossicles at final radiograph.

Conclusion: The incidence of os subfibulare at the initial radiograph was about 1%. The chance of ossicle formation after ankle inversion injury was substantially high in pediatric population. Based on the findings of our study, we carefully suggest that majority, if not all, of os subfibulare would be posttraumatic in pediatric period. Therefore, ankle inversion injury in children should be managed more actively to reduce the chance of posttraumatic os subfibulare formation.

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