Using Surgical Codes as a Proxy For Elbow Osteochondritis Dissecans Surgery In Adolescent Baseball Players - A Retrospective Epidemiological Study

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INTRODUCTION: Capitellar osteochondritis dissecans (OCD) is a disorder frequently affecting adolescent athletes and can lead to chronic disability or surgery. While preventive measures have been advocated, there is no established method to monitor the prevalence of OCD. The purpose of this study is to verify the validity of using specific surgical codes, such as loose body removal, obtained from the NDB data as a proxy for OCD in adolescent baseball players. We hypothesized that one or more of the surgical procedures used to treat OCD, as indicated by particular surgical codes, would reflect certain demographic characteristics, such as sex and age, associated with OCD prevalence (specifically, that the majority of such surgeries would be for male youth baseball players between the ages of 10 and 19), and that the regional distribution of such surgeries would correlate with publication activity concerning OCD, as it is an indicator of the expertise available for diagnosis and treatment. In doing so, we would establish an effective means to use a surgical code as a proxy for OCD for public health purposes.
METHODS: A retrospective epidemiological analysis was conducted using NDB Open Data Japan from 2014 to 2022. Surgical procedures potentially linked to OCD, including drilling, bone debridement, synovectomy, and loose body removal were analyzed by age, sex, and geographic distribution. Bibliometric data on OCD-related publications were extracted to assess their correlation with regional surgical incidence. Statistical analyses were performed to evaluate the validity of these surgical codes as proxies for OCD.
RESULTS: Loose body removal was performed in 11,120 cases over the 9-year study period and was the most strongly associated with OCD, with 97% of procedures performed on males and 64% on patients under 20 years of age (Fig 1). Significant regional variation was observed, with Tokushima Prefecture showing the highest incidence of loose body removal, mirroring its strong publication record on this topic. In contrast, drilling and bone debridement showed weaker demographic alignment with OCD and no significant correlation with publication activity. Synovectomy demonstrated moderate regional alignment but lacked demographic specificity for OCD.
DISCUSSION AND CONCLUSION: This study showed that between 2014 and 2022 an average of 1,236 loose body removal procedures per year were performed, of which 97% were on males and 64% were performed on patients younger than 20 years of age. In addition, the regional distribution of loose body removal procedures correlated with the regional distribution of osteochondritis dissecans (OCD)-related publications. Based on distinct patterns in age, sex, and regional distributions, our findings validate the hypothesis that specific surgical codes can serve as proxies for capitellar OCD in adolescent baseball players. The results demonstrated that the surgical code for loose body removal predominantly represents younger males, consistent with the demographic most affected by OCD in youth baseball. Moreover, the geographic variation in surgery incidence and the correlations to publication activity highlight the potential for the selected surgical codes to reflect regional differences in clinical expertise and research focus. This, to our knowledge, is the first study to leverage a national database to approximate the epidemiology of OCD-related surgeries. The integration of bibliometric analysis further adds a unique dimension, providing insights into how clinical practice and academic research intersect geographically. These findings establish a foundation for future studies to assess preventive strategies and guide resource allocation for OCD management in youth athletes.

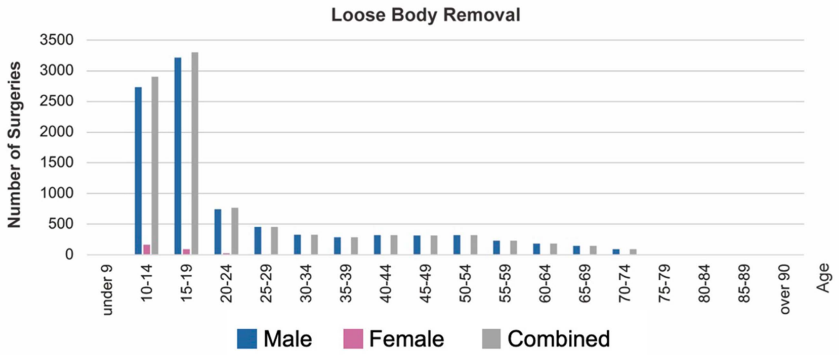

Figure 1: Distribution of the total numbers of osteochondritis-dissecans-related surgeries for Loose Body Removal in NDB Open Data Japan from 2014 to 2022 by sex and age groups. Bars for each age group indicate the number of surgeries. Blue bars are for male patients, pink bars are for female patients, and gray bars indicate the combined total.