INTRODUCTION: Avulsion fractures of the sublime tubercle of the ulna have been reported as a cause of medial elbow pain and instability in overhead athletes and baseball pitchers in adolescence and early adulthood. While the management of ulnar collateral ligament and medial epicondyle injuries have been extensively described and reported, little has been published on the treatment of the less common bony avulsion fracture of the sublime tubercle. The objective of this study was to characterize injury pattern, treatment, and outcomes for sublime tubercle avulsion fractures in adolescents.

METHODS: A multicenter retrospective review was conducted from July 2005 to December 2020. Sublime tubercle avulsion fractures were identified by surgeon records or a database query of radiology reports. Inclusion criteria included patients ≤19 years old with a sublime tubercle avulsion fracture identified on at least one radiologic study (radiograph, CT, or MRI). Data collected included sex, age, and sport; clinical presentation including mechanism of injury, associated injuries, acuity, initial treatment; and outcomes including complications, final range of motion, patient-reported symptoms, radiographic union, and return to activities or sport.

RESULTS: Forty patients identified with sublime tubercle avulsion fractures, which were 78% male and had a median age of 15 years (range, 8-19 years). About two-thirds of cases (n=27) were determined to be simple, or isolated, sublime tubercle fractures. One-third (n=13) were deemed complex injuries, with at least one other associated fracture. Complex injuries were more likely to be sustained in a contact mechanism and to undergo initial operative treatment. Simple injuries fared better with 87% experiencing a good or excellent outcome based on Roberts Criteria, compared to just 54% of those with complex injuries. Of the overhead athletes initially managed nonsurgically, 4 of 16 (25%) ultimately underwent ulnar collateral ligament reconstruction.

DISCUSSION AND CONCLUSION: This series of adolescents with sublime tubercle avulsion fractures expands our understanding of the epidemiology of this rare injury, which was previously only described as a noncontact injury in baseball players. Outcomes differ significantly based on the presence or absence of associated injury, with complex injuries at risk for poorer outcomes. For throwing athletes, our results challenge the historical findings that the majority of sublime tubercle avulsion fractures fail nonsurgical management. Unlike purely ligamentous injuries, bony avulsions may be treated nonsurgically with good results and return to high level throwing in adolescent patients.

![Figure 1: AP radiographs of a simple sublime tubercle fracture on initial presentation (left) and after 3 weeks of immobilization in a long arm cast (right).](image1)

![Figure 2: AP and lateral radiographs of a complex sublime tubercle fracture with an associated medial epicondyle fracture, which was treated in a long arm cast for 3 weeks. (A) Initial injury films. (B) 0.5 months post-injury films showing healed sublime tubercle fracture. The patient’s course was complicated by a medial epicondyle nonunion, stiffness, and ulnar neuritis, and ultimately required partial medial epicondyle excision and ulnar nerve transposition at 18 months post-injury.](image2)