

Introduction:

Approximately 15% of all adolescent injuries of the long bones involve the epiphyseal growth plate, and 2.9% of these are Tillaux fractures. [1] The physis of the distal tibia accounts for 18% of the overall limb length and 32% of the overall growth of the tibia. The distal tibial physis closes at about 15 years of age in girls and 17 in boys. Closure begins centrally, extends medially, and then laterally over 18 month period. This asymmetric closure sequence leads to the characteristic adolescent transitional fractures of the ankle, i.e. the tri-plane or Tillaux types. [2] The fragment is avulsed due to the strong anterior inferior tibiofibular ligament (originates from the anterolateral surface of the distal tibia and runs obliquely and inferiorly to the distal fibula) in supination external rotation injury of the foot in relation to the leg. [3,4] **Fig.1(a,b)**This injury is rarely seen in adults, because the ligament firstly gives way instead of avulsing the tibial fragment from its epiphyseal attachment, resulting in a ligament injury known as a Tillaux lesion. This is a Salter-Harris type III epiphyseal injury. [5,6] Complaints were ankle swelling, lateral ankle bruising, and anterolateral ankle pain with inability to bear weight. Patient always denied any previous ankle fracture or injury. Tillaux fractures if not properly treated can cause pain or stiffness for up to 2 years after the injury, with joint incongruity resulting in degenerative arthritis, varus deformity, rotational deformity (rare), nonunion, delayed union (rare), and leg-length inequality (extremely rare). [2,4]

We present a case series of adolescent displaced Tillaux fractures, which was carried out exclusively surgically and led to an excellent outcome at the age of growth cessation.

Patient and methods:

After approval by our institutional ethical committee, this prospective cohort study was done between May 2013 and May 2016 at our institution. This study was carried-up on 13 patients with 13 consecutive juvenile Tillaux fractures. All patients were followed-up (ranged 60-24m.) with a mean 41.7 months. Patient`s age ranged (12-17 y.) with an average 13.4 years. Of those 13 patients, there were 9 females (69.2%) and 4 males (30.8%). Right side was affected in 6 patients (46%), while the left was affected in the remnant 7 patients (54%). There was no associated fracture in all patients. Mechanism of trauma in all patients was twisting ankle injury. Time elapsed between trauma and surgical interference ranged (1-7 days) with an average 5.4 days. Diagnosis was based on clinical and recognized by radiological criteria (X-ray views and CT scans) for all cases. From those 13 patients there were 4 initially non-displaced Tillaux fracture, but on the follow-up i.e.(the 1st visit, after one week from the initial trauma), follow-up X-rays and CT scans demonstrated displacement more than 2mm., so those 4 patients were included within the surgically operated patients. All patient weights were appropriate regarding their age and heights, while there were 5 girls who showed marked overweight. All patient information, disease-, and treatment-related data were retrieved by a review of the patients` charts. American Orthopedics Foot and Ankle Society score system (AOFAS score) [7] of the ankle joint was recorded.