

**Introduction:**

Pilon fracture is a severe and a challenging to treat distal tibial injury. Since there is a limited muscle cover between skin and bone at this level of the lower limb, energy derived from injury is transferred directly to these soft tissue structures.<sup>1</sup> These fractures account for about 1% of lower limb fractures and less than 10% of all tibial fractures.<sup>2</sup> In contrast to the rotational mechanisms that result in malleolar fractures and fracture-dislocations of the ankle, distal tibial pilon fractures typically result from high-energy axial loading mechanisms, caused by falls from heights or motor vehicle accidents.<sup>3</sup> In these high-energy traumas there is typically remarkable comminution and impaction of the joint surface.<sup>4-6</sup> This study presents a case series of primary ankle arthrodesis using retrograde calcaneal nail to treat closed comminuted tibial pilon fractures and to analyze its clinical and radiological outcomes as well as complications encountered.

**Methodology:**

This study is a prospective follow-up study. All operations were done between December 2010 and December 2014 at department of orthopedics and traumatology, Benha university hospitals. Twenty consecutive closed highly comminuted non-reconstructable (>50% affection of the articular surface) pilon fracture patients were treated by primary ankle arthrodesis using a retrograde calcaneal nail. Age of patients at time of injury ranged between (20–47years) with an average 33 years. There were 3 (15%) female and 17 (85%) male. Fractures affected right tibial pilon in 13 patients (65%) and left pilon in 7 (35%). The chief mechanisms of injury were motor vehicle accidents (n. = 17; 85%) and falls from a height (n. = 3; 15%). Fractures were graded according to Rüedi and Allgöwer<sup>7</sup> as type III. Rüedi and Allgöwer classification system has the advantage of being simple and easily applicable. AO classification, though very comprehensive, is highly complicated and difficult to be applicable. Rüdi and Allgöwer described three groups, specific to tibial pilon fractures, based on the size and displacement of articular fragments: type I represents non-displaced intra-

articular fractures without loss of articular congruency; type II represents displaced fractures with loss of articular congruency; and type III represents those severely comminuted fractures with impaction of the distal tibia. All patients were followed-up with a follow-up period (12-60m.) with an average 34 months.