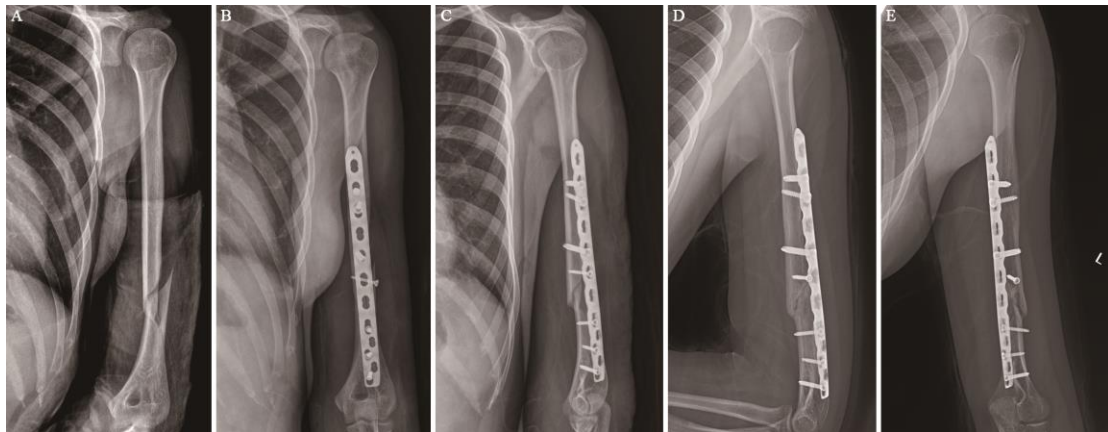
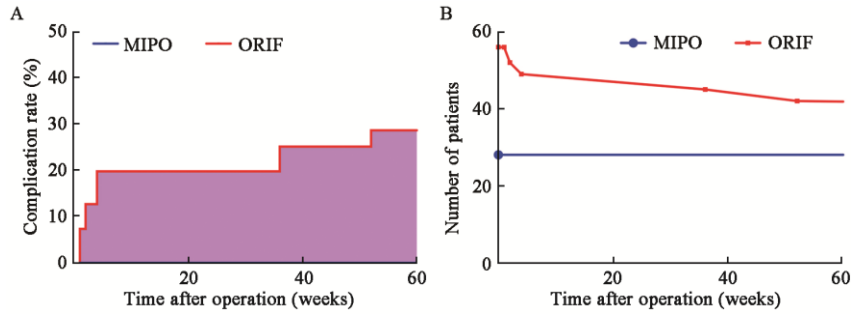


Supplementary Figure 1: Pictures of a 19-year-old patient with injured right upper limb underwent MIPO using LCP. (A) Preoperative radiography showing the middle-distal humeral shaft fracture with OTA classification of B1. (B) The LCP was contoured to conform to the anterolateral surface of the mid-distal humerus. (C) Two small incisions can be observed on the anterior of the right upper limb. (D) Six-month postoperative radiography showing the union of the fracture. (E) One-year postoperative radiography showing that the internal fixation was removed. **MIPO operation:** Let the patient lie in the supine position and abduct the shoulder to 90° on a radiolucent table. Two mini-incisions, each about 4 cm long, are made: one is a proximal incision between the biceps and deltoid muscles, and the other is a distal incision along the lateral aspect of the humerus in the gap between the triceps and brachioradialis muscles. A tunnel is then created between the two incisions under the muscle tissue overlying the fracture site. A contoured metaphyseal locking plate is then placed via the incisions. After assessment of the quality of reduction, the proximal end of the fracture is fixed with three 3.5 mm-diameter locking screws and the distal end is fixed with four 2.5 mm-diameter locking screws. LCP: Locking compression plate; MIPO: Minimally invasive plating osteosynthesis; OTA: Orthopedic Trauma Association; R: Right side.



Supplementary Figure 2: Pictures of a 23-year-old female patient with injured left upper limb underwent ORIF using a dynamic compression plate (DCP). (A) Preoperative radiography showing the middle-distal humeral shaft fracture with OTA classification of A1. (B–C) Postoperative radiography showing the fracture fixed at the rear. (D–E) Five-month postoperative radiography showing bone union of the fracture.

ORIF operation: Let the patient lie on the healthy side and abduct the shoulder to 90°. After creating a posterior median incision, the triceps brachii was split from the posterior median and the fracture site was exposed. The hematoma and soft tissue between the fragments were cleaned up, and the fracture was anatomically reduced and fixed with locking compression plate. Radial nerve exposure is not necessary. ORIF: Open reduction and internal fixation; OTA: Orthopedic Trauma Association.



Supplementary Figure 3: Survival analysis and cumulative complication incidence curves of MIPO and ORIF groups with mid-distal humeral shaft fracture. Results showed the total major complication rate was highly significantly lower in the MIPO group than in the ORIF group ($P < 0.001$). (A) Kaplan–Meier curves of major complications. (B) Cumulative complication of subjects at risk. MIPO: Minimally invasive plating osteosynthesis; ORIF: Open reduction and internal fixation.