The surgical technique of autogenous pillar bone graft for distal humerus nonunion with ipsilateral arteriovenous shunts: Case report

Sang-Uk Lee, Ki-Tae Na, Do-Yeol Kim, Won-Woo Kang, Jong-Yoon Lee

Department of Orthopedic Surgery, The Catholic University of Korea, Incheon St. Mary’s Hospital

Introduction

Nonunion is one of the most common and challenging complications of distal humeral fractures. Patients with severe bone loss or age over 65 years are recommended a semiconstrained total elbow arthroplasty. However the complication rates of arthroplasty are relatively high. In distal humerus nonunion with metaphyseal bone defect, positioning of anatomical locking plate is difficult due to abnormal bone contour, and reduction of small distal bone fragment is not easy. We describe our surgical management of patient with chronic renal failure who sustained distal humerus nonunion with bone defect, in the ipsilateral limb containing dialysis shunts.

Materials and methods

A 67-year old female got injured to her left elbow containing arteriovenous shunts when she slipped down 6 months ago. Upon examination, her elbow joint was markedly deformed and range of motion was limited due to pain. Plain radiographs and CT-scan revealed nonunion and displacement of the distal humerus with several bone fragments around the fracture site. Although the injured limb contained arteriovenous shunts, tourniquet was used. On the intraoperative findings, metaphyseal bone was absorbed and distal bone fragment could not be anatomically reduced to humerus shaft due to metaphyseal bone defect. To restore alignment, anatomical length and bone defect, autogenous strut bone graft was inserted between the hole of distal bone fragment and intramedullary canal of humerus shaft. And then the orthogonal locking plate fixation with corticocancellous bone graft was applied via the posterior Campbell approach.

Results

The duration of the postoperative follow-up period was 9 months, and the subject’s elbow motion values were 0°, 140°, 80° and 80° during extension, flexion, pronation and supination. The patient visual analog scale; QuickDASH score; and Mayo elbow performance score were all excellent, and bony union was achieved. No shunt dysfunction complications were noted.

Discussion

If no bone loss

\[ \rightarrow \text{I/F c anatomical plate} \]

If bone loss

Complex & technically demanding to restore
- alignment,
- anatomical length,
- bone defect,
- contour for anatomical locking plate positioning

Conclusion

Anatomical locking plate fixation with autogenous pillar bone graft might be useful for treating distal humerus fracture or nonunion with metaphyseal bone defect to restore alignment, anatomical length, bone defect, and contour for anatomical locking plate positioning.