INTRODUCTION

Trapeziometacarpal (TMC) arthrosis

• Among surgical methods for advanced trapeziometacarpal (TMC) arthrosis, arthrodesis may benefit high-demand patients such as laborers because it preserves the osseous foundation of the thumb.

• Although many methods have been developed for TMC arthrodesis, there is no doubt that the basic common goal of these methods is to obtain a solid union.

• Here, we introduce a novel method of TMC arthrodesis that can be performed with small incision using common devices at low cost.

MATERIALS AND METHODS

Patients’ characteristics

• Three cases of trapeziometacarpal arthrodesis performed with chevron osteotomy, longitudinal K-wire(s), and K-wire compression staples
  1) right thumb of a 65-year-old male
  2) right thumb of a 69-year-old female
  3) left thumb of a 73-year-old female.

• Eaton stage 3 thumb basal joint arthritis

• All patients had persistent pain in the TMC joint despite more than 6 months of conservative treatment prior to surgery.

Surgical technique

A 4-cm Wagner skin incision was made upon the TMC joint. TMC joint was identified between abductor pollicis longus and extensor pollicis brevis tendons while protecting sensory branches of the radial nerve and the radial artery.

While positioning the thumb at a functional position of 30° abduction, extension, and pronation, a chevron osteotomy was performed in the metacarpal bone and the trapezium to expose the cancellous bone.

The metacarpal bone and the trapezium were approximated and primarily fixed with a longitudinal K-wire using image intensifier.

A staple was made by bending the K-wire of 1.6 mm or 1.8 mm diameter into a trapezoidal shape close to a rectangle.

Points to insert the staple in the trapezium and the metacarpal base were marked on the cortical surface, with distance slightly narrower than the narrow width of the staple. After drilling through those points with a K-wire, the staple was inserted, ensuring compression at the osteotomy site.

Results

TMC arthrodesis

• Successful arthrodesis was achieved in all three cases.

• The patients were satisfied with their relatively small incision.

• Their thumb range of motion (ROM) was good enough for daily life.

Complications

• Although a slight pull-out of a staple was observed in one patient, the patient had no irritation from it before removal.

• No other complications specifically associated with the surgery were observed.

Discussion

If the trapeziometacarpal joint is fixed only by staples, dorsal translation of the metacarpal bone may result in pull-out of staples (A).

With a longitudinal K-wire, translation in the trapeziometacarpal joint can be stabilized (B).

Conclusion

• We achieved successful TMC arthrodesis by using a combination of chevron osteotomy, longitudinal K-wire(s), and K-wire compression staples.

• Our method can be a good option for TMC arthrodesis in that it has advantages of small incision, common devices, and low cost.

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