



Correction of severe spastic wrist and hand deformity using wedge arthrodesis and intermetacarpal fusion: a case report

Spastik el bileği ve el deformitesinin kama artrodezi ve intermetakarpal füzyonla düzeltilmesi: Olgu sunumu

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An unusable hand caused by fixed flexion contracture of the wrist joint and the thumb-in-palm deformity of the hand is frequently seen in cerebral palsy. A 24-year-old male patient presented with an unusable hand due to cerebral palsy. He underwent wedge arthrodesis of the wrist followed by intermetacarpal fusion. The result was satisfactory in terms of appearance and functional opposition of the thumb to the other fingers.

Key words: Cerebral palsy/complications; hand deformities; wrist joint/surgery.

El bileği eklemının kalıcı fleksiyon kontraktürü ve başparmağın avuç içi pozisyonundaki deformitesi beyin felcinde sık karşılaşılan ve eli kullanılmaz hale getiren bir komplikasyondur. Yirmi dört yaşında erkek hasta bu durumda bir deformiteyle başvurdu. Hastaya el bileği kama artrodezi ve intermetakarpal füzyon uygulandı. Tedavi, elin görünüşü ve başparmağın diğer parmaklarla birleştirilmesi açısından tatmin edici sonuç verdi.

Anahtar sözcükler: Beyin felci/komplikasyon; el deformitesi; el bileği eklemi/cerrahi.

An unusable hand caused by fixed flexion contracture of the wrist joint and the thumb-in-palm deformity of the hand is frequently seen in cerebral palsy. Wedge arthrodesis of the wrist described by Evans^[1] in 1955 combined with the intermetacarpal fusion described by Smillie^[2] in 1953 is one of the possible treatments, whereby a stable wrist and thumb opposition can be obtained in the same session.

The purpose of this case report was to demonstrate the usefulness of this treatment in flexion deformity of the wrist joint and the thumb-in-palm deformity of the spastic hand.

CASE REPORT

A 24-year-old male patient presented with an unusable hand due to cerebral palsy. A single-staged procedure was planned for the treatment of flexion deformity of the wrist joint and the thumb-in-palm

deformity of the hand (Fig. 1a, b). Under a pneumatic tourniquet and through a 10-cm longitudinal incision in the midline over the dorsum of the wrist, the extensor tendons were identified and retracted. The capsule of the wrist joint was divided transversely. The distal ends of the radius and ulna were stretched and the soft tissues were stripped from their volar surfaces. With further flexion until the palm of the hand, the wrist lied parallel to the forearm. The distal part of the ulna was resected and a wedge was created in the distal part of the radius (Fig 1c, d). The carpus was then divided transversely with an osteotome. The resected radius was implanted into the carpus and fixed with K-wires. Through a small incision in the ulnar part of the first metacarpus and the radial part of the second metacarpus, a subcutaneous graft tunnel was made. The periosteum was incised. Using the resected distal end of the ulna, an

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Fig. 1. (a, b) Preoperative appearance of the spastic hand. (c) The distal end of the ulna is resected and the distal radius is exposed. (d) A wedge is created in the distal radius. (e, f) Postoperative radiographs. (g) Postoperative appearance demonstrating a functional outcome and thumb opposition.

intermetacarpal fusion was performed. A compression screw was used to maintain fixation of the bone graft (Fig 1e, f). Following the procedure, the wrist was immobilized with a Bennett plaster fixation for three months. The result was satisfactory in terms of appearance and functional use (Fig 1g).

DISCUSSION

The imbalance between the agonist and antagonist muscles around the joints leads to various deformities in cerebral palsy. As for the wrist joint, the typical contracture is characterized by flexion, ulnar

duction, and pronation, usually resulting in the thumb-in-palm deformity of the hand (Fig 1a, b).

Wedge arthrodesis of the wrist was described by Evans^[1] in 1955 and the intermetacarpal fusion was described by Smillie^[2] in 1953. Combination of both techniques enables a stable wrist and opposition of the thumb for catching.

Wedge arthrodesis fixes the wrist in the optimal position and shortens the forearm. Thus all tendons around the wrist become relatively longer than before. Making fusion between the

first and second metacarpus provides a good opposition of the thumb to the other fingers. This method needs an autologous bone graft, but as in our case, the distal end of the ulna resected before can also be used.

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