We report our experience with a 1-2 intramedullary k wire fixation. Single 1.6-1.8 k wire was used in 15 patients and 2 in 5 patients. The majority of mc shaft fractures (2) and was better then plate with less complications for single mc shaft fx (3). Commercial kits for IMN were also developed.

K wires
- K wire fixation is a common and versatile technique.
- A 1-2 complication rate but mostly minor (5-20\% pin tract infections).
- Traditionally closed reduction and pc pins through the mc head or transverse pinning was done. But, Adhesions with stiffness in MPJ may be a problem. In meta analysis of different treatments, zong et al (1) found that ante-grade pinning was superior to transverse pinning.

K wires are used for intramedullary fixation as well. IMN kw fixation for MC fractures was described by G. Foucher in 1995 as “bouquet pinning” He used 2-3 ante-grade bent k wires from mc base. Others reported good results with this method (4) and less complications then with crossed retrograde k wires.

We report our experience with a 1-2 intramedullary k wire fixation (imkw) method in finger metacarpal neck and shaft fractures.

Technique of surgery
- Tools needed:
  - 1.4-1.8 mm k wires. 2.5 drill. Pliers, cutter. T handle C Arm.
  - Pre band 1.4-1.8 mm k wires with pliers and cut tip obliquely.
  - Make a stab >1 cm skin incision near base of mc. Drill a 2.5 hole in the base with a drill guide as soft tissue protector.
  - Perform a closed reduction and pass 1-2 k wires with a T handle by feel and under scan. Check for rotation.

Post-operative:
- Post op: Spilt wrist (and MPJ only if rotationally unstable) for 3 weeks. move the fingers early on
- F-up in 7-10 days for rotation check, suture removal, cast refitting and x-ray.
- at 3 weeks remove cast and K wires in clinic for boxer fx. At 5-6 weeks post op for shaft fx.

Examples:
- 2nd mc shaft mal-rotated
  - 2.5 months. Solid union. good rom:
  - 5th mc angulated to 35 degrees 10 days post fx (pre op> 3w>6w)

Multiple mc fx:
- 45 days post fracture: mal-union 5th mid-shaft at 45 deg >>orif/imkw

Results
- 16/20 (80\%) of fractures united with anatomic or near anatomic alignment.
- 3/20 (1 neck 2 shaft) healed with residual but acceptable angulation (15-20 degrees)
- 5\% neck fx healed with 35 deg angulation (operated at 2 weeks, incompletely corrected 55 to 20 deg in surgery).
- Boxer fx healed radiologically at around 4-6 weeks and shaft at 8-10 weeks.

Complications
- Intraoperative:
- in 3/23 pts closed imkw couldn’t be achieved: needed limited open reduction or temporary maneuver by k wire through mc head to control distal fragment
- 4/23 patients needed additional k wire from neck of mc (2 were thumb mc spiral fx)

Post-operative:
- 4/20 (20\%) mild pin tract infections (serous dc or redness) all resolved with oral Abx.
- 1 loss of 20 deg of mpj extension (this had additional k wire inserted from mc neck)
- 1 mild residual stiffness at 3 months (multi mc fx)
- 4 united with mild to moderate residual angulation
- 1 re-fracture of 5th shaft after 1 year (united at 3 months. came back 1 year later with a re-fracture shaft with the k wire still inside and bent to 40deg)

Discussion and conclusions
- this technique of imkw is Readily available, versatile and un-costly.
- Short or time, not difficult to perform (especially in border mc). With good clinical and radiological results.
- We had High complication rate like others, but minor: pin tract infection in 20\%. Mild residual but acceptable angulation in up to 20\%. (but most in late surgery)
- Single k wire is enough for MC neck fractures and for transverse shaft fractures, and 2 k wires are needed for spiral shaft fx. Fixing 4th mc and thumb proved more difficult.
- Late mal-union can be done (openly) with imkw as well as Multiple mc FX..
- Surgery is Best done in <10 days for neck fx and <14 for shaft fx.
- K Wires should be removed after 3 weeks for mc neck fractures and 5-6 weeks for shaft fracture (leaving k wire buried under the skin, should be considered for shaft fx as this may lessen pin tract infection rate)

Bibliography