

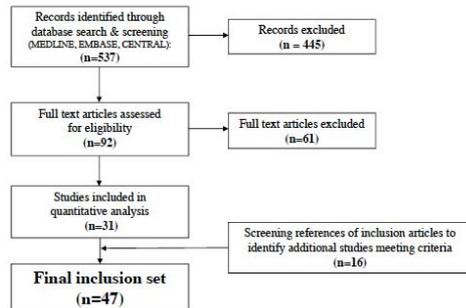
INTRODUCTION

- Fractures of the hand and wrist are common injuries that are frequently treated with K-wires.
- There is no consensus as to whether K-wires should be left buried or exposed in order to minimize pin site complications.
- Purpose:** To perform a systematic review and meta-analysis comparing pin-site infection and total complication rates in hand and wrist fractures treated with buried versus exposed K-wire fixation.

METHODS

- Initial database search yielded 537 studies, of which 47 met inclusion criteria for systematic review, 5 met inclusion criteria for meta-analysis.

Figure 1: Inclusion Set



Articles were excluded if they did not meet the following criteria:

- Published between Oct. 1990 and Oct. 2016;
- English translation available;
- Documented follow-up with minimum one visit following pin removal;
- Defined criteria for pin site infection;
- Pin duration noted;
- Clearly defined surgical techniques of buried vs. exposed;
- Minimum 10 K-wire patients in study

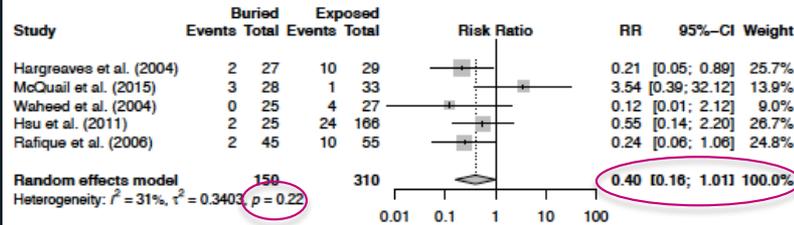
RESULTS

Table 1: Pin Site Infection Rate and Total Complication Rate

	Pooled Infection Rate (%)	Range	Q-value	P-value	I ²	Total Complication Rate (%)	Range	Q-value	P-value	I ²
Buried K-Wires										
all fractures	3.0	0.0 to 8.0	5.3	>0.05	0.0	24.0	0.0 to 62.0	31.6	<0.05	58.8
distal radius	3.0	0.0 to 9.2	5.0	>0.05	-	24.3	0.0 to 62.0	-	-	-
metacarpal/phalangeal	3.8	0.0 to 8.0	0.0	>0.05	-	17.0	12.0 to 21.4	-	-	-
Exposed K-Wires										
all fractures	6.1	0.0 to 34.5	51.9	<0.05	34.5	18.6	0.0 to 57.9	202.0	<0.05	83.2
distal radius	5.9	0.0 to 34.5	40.7	>0.05	-	19.2	0.0 to 68.8	-	-	-
metacarpal/phalangeal	6.8	2.0 to 14.5	10.6	<0.05	-	16.8	6.7 to 24.8	-	-	-

*across all fractures, there were 2,050 distal radius fractures and 396 metacarpal/phalangeal fractures

Figure 2: Meta-Analysis Forest Plot



Limitations

- Lack of standardization of pin care, immobilization technique and duration, and pre/post operative technique may contribute to variable infection rates across buried and exposed cohorts.
- Correlation of pin site infection to clinical outcome should be assessed given the wide range of treatment extending from oral antibiotics to surgical debridement.

CONCLUSION

- Our findings suggest a non-significant trend towards diminished pin-site infection rates among buried compared to exposed K-wires in hand and wrist fractures.
- Additional high quality studies evaluating pin-site infections and outcomes of buried versus exposed K-wires are needed.

- Pooled infection rates were higher in the exposed cohort compared to the buried cohort (6.1% vs 3.0%, p=0.06) (Table 1).
- Pin site infection rates were lower in distal radius versus metacarpal / phalangeal fractures in both buried and exposed cohorts (Table 1).
- Buried K-wires are associated with a non-significantly decreased rate of pin site infections (OR 0.40, CI: 0.16-1.01) (Figure 2).