Hook Plate (HP) Versus Coracoclavicular Ligament Reconstruction (CCLR) in Fractures of the Distal Clavicle: A Meta-Analysis of Clinical Outcomes

Omar E. S. Mostafa[1], MohammedAbbas Remtulla[2], Romir Patel[3], Robert W. Jordan[4], Jarret Woodmass[5], Tanujan Thangarajah[6], Peter D'Alessandro[7,8], Shahbaz S. Malik[9]

1. The Dudley Group NHS Foundation Trust, Dudley, United Kingdom.
2. University Hospital Coventry & Warwickshire, Coventry, United Kingdom.
3. College of Medicine and Health, University of Birmingham, Birmingham, United Kingdom.
4. University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom.
5. Pan Am Clinic, Winnipeg, Canada.
6. University College London Hospitals NHS Foundation Trust, London, United Kingdom.
7. Discipline of Surgery, University of Western Australia Medical School, Australia.
8. Orthopaedic Research Foundation of Western Australia
9. Worcestershire Acute Hospitals NHS Trust, Worcester, United Kingdom.

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Faculty Disclosure Information

- **Peter D'Alessandro** –
  - Speaker for Medacta, Smith & Nephew, Arthrex.
  - Paid Consultant for Smith & Nephew;
  - Support received from Smith & Nephew, Arthrex;
  - Board of Directors member for Australian Orthopaedic Association
- **Jarret Woodmass**
  - Paid Consultant for Stryker, ConMed, Smith & Nephew

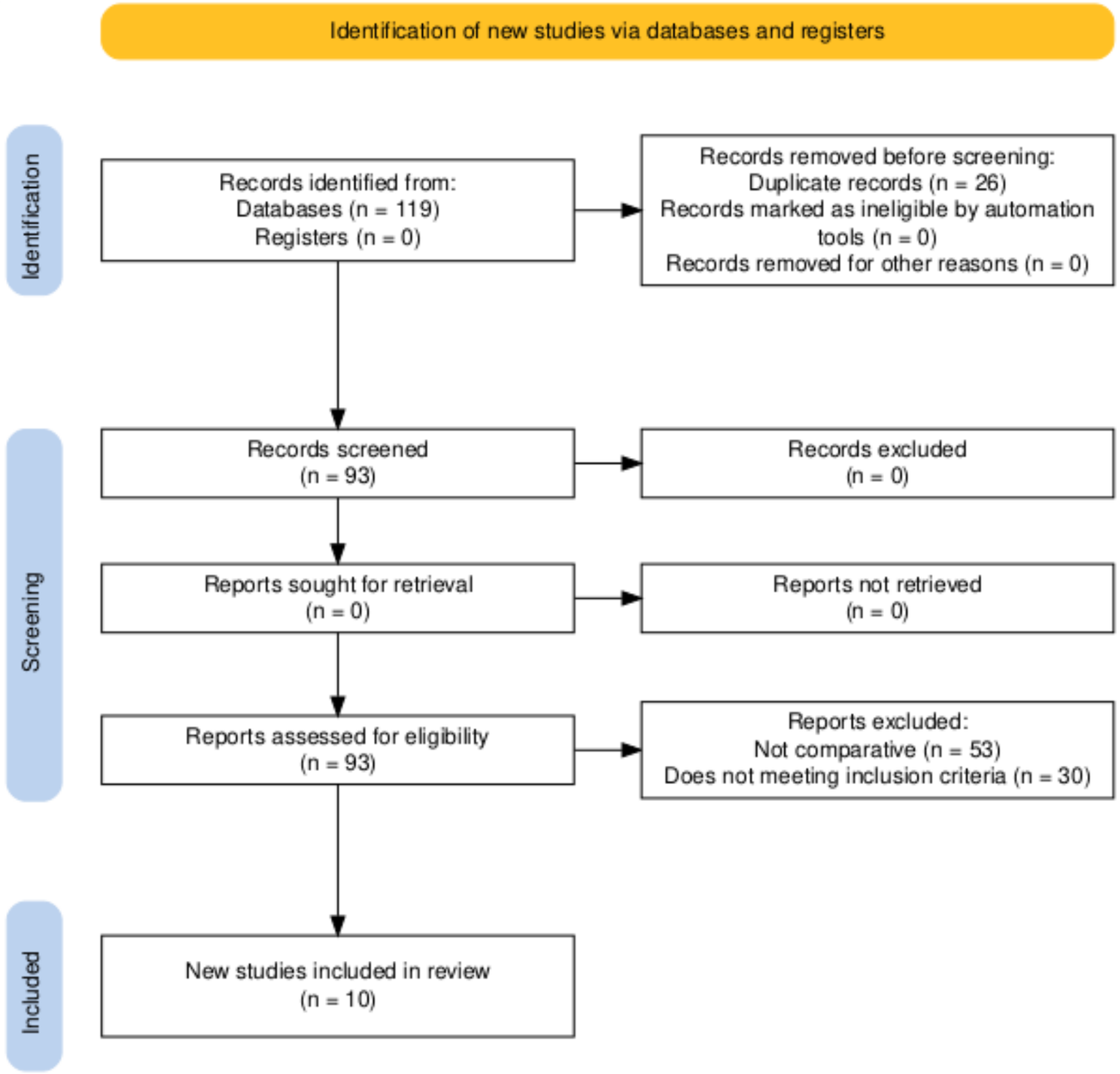
Background

- Hook Plates are widely accepted modality in treatment of DDCF, albeit associated with postoperative complications that necessitate re-operation for removal of hardware.
- However, reconstruction techniques with coracoclavicular ligament is a successful alternative that avoids hardware removal.
- We performed a review to compare clinical outcomes and complications of both HP vs CCLR in DDCF

Methodology

- **Registration & Guidelines:**
  – Prospectively registered on **PROSPERO (CRD42021237246)**
  – Conducted in accordance with **PRISMA** guidelines
- **Literature Search:**
  – Databases: **MEDLINE, Embase, PubMed**
  – Search performed in August 2024
- **Inclusion Criteria:**
  – Only comparative studies of patients with displaced distal third clavicle fractures undergoing HP or CCLR were included.
- **Quality Appraisal:**
  – Methodological quality assessed using the **NOS** and **ROB2** tools
- **Meta-analysis:**
  – Performed on outcomes reported in three or more studies

Search Strategy



Results

Total Studies Included

- 10 studies included (9 Level IV; 1 Level II)
    - Total Patients: HP 221 vs CCLR 205

Patient demographics (HP vs CCLR):

- Male %: 57.5% vs 66.3%
- Average follow up: 38 months (5 months - 6 years)
- All studies (n=10) included patients with Neer II fractures
- N=3 further studies included patients with Neer V fractures
- N=1 further study included patients with Neer I fractures

Results: Main Outcomes

Element	HP	CCLR	P Value
Union (average, %)	98.5%	92.4%	0.08
Postop CMS Score (range)	**84 - 97**	89 - 97	0.01
Postop VAS Score (range)	0.5 - 1.6	**0.38 - 1.2**	0.03
Postop ASES Score (range)	**83.9 - 89.9**	89.9 - 93	0.0009
Operative Time (range, min)	49 - 63	52 - 108	0.33
Post-op Complications (average, %)	26.7%	**6.3%**	<0.0001
Re-operation (average, %)	34.8%	3.9%	0.00001

HP provided a statistically significant improvement in postoperative CMS and ASES scores, whilst CCLR provided a statistically significant improvement in postoperative VAS scores and an overall lower complications profile

Results: Complications and Re-Operations

Complication	HP	CCLR
Implant-related discomfort	16.7%	-
Soft-tissue related	4.9%	3.4%
Peri-prosthetic Fractures	2.7%	-
Symptomatic non-union	-	1.3%
Failure of fixation	-	0.5%
Infection	1.95%	1.35%

Reason for re-operation	HP	CCLR
Hardware removal (symptomatic)	29.4%	-
Infection	-	1.95%

Conclusion

- DDCF have high union rate with both HP and CCLR.
- However, incidence of postoperative complications and subsequently re-operation for removal of hardware was significantly higher with hook plates.
- When discussing treatment options with patients, it is important to highlight complication profile when using HP.

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