Meta-analysis of the Mid-foot Fusion Bolt in Charcot Neuroarthropathy

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Kings College Hospital, London

RS Ahluwalia, S O Dak, ILH Reichert, ME Edmonds, V Kavarthapu
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• Diabetic Foot Deformity
  – Charcot neuroarthropathy (CN) of the foot can cause severe bone and joint destruction
  – to prevent ongoing tissue damage – adequate assessment, medical stabilisation and surgical care combine to provide a limb salvage care.

• Early effective treatment is essential
  – long term infection is problematic & costly for the NHS; amputation leads to an increased risk of 5yr mortality
Aim

- Reconstruction can lead to stable foot shape
  - Increase in reported series, and improvement on long-term results preventing reduction in ulceration
  - The aim of surgical reconstruction is to correct the deformity and achieve bone fusion, provide a plantigrade foot to ambulate on using accommodative footwear.

- Column beaming using the MCB is a new technique described to stabilize the medial and/or lateral columns.

- We performed a meta-analysis to assess the outcome of the use of column beaming in treatment of CN.
Methods

• The review incorporated an electronic search of the Medline database using PubMed as search engine as well as Embase, The Cochrane Library, and ProQuest.

• We performed a search of the English literature for the following search terms:

• All studies published up until 2015 were included.
Results

- Only 10 studies met the inclusion criteria, and were identified for evaluation.

- There were a total of 197 feet in 191 patients; average age 58.1 years (29-81 years).

- Diabetes mellitus was the most common cause of CN (81.8%).

- The average follow-up duration post-operatively was 30 months (range 3-137 months).
Results

- All studies reported improvement in correction of these deformities both clinically and radiologically.

- Common to see an associated loss of correction over the follow-up period.

- 49.8% of patients experienced complications, resulting in revision and lower than expected fusion rates.
From the 9 studies and 149 reconstructions – 48.3% of patients had a complication which included:

- Screw breakage or migration (33)
- Infection (42)
- Wound dehiscence (20)
- Peri-prosthetic fractures (4)
Discussion

• The MCB provides excellent correction of deformity, but carries a high rate of failure.

• This is most likely due to the devise inability to provide enough compression and reduce shear stress at the bone inter-phases.

• Whilst there is significant heterogeneity in the literature; current evidence suggests surgeons should use this device with caution.
Conclusion

• Whilst there is significant heterogeneity in the literature:
  – Classification
  – Indications
  – Surgical indications
  – Surgical technique & philosophy

• **However, Current evidence suggests surgeons should use this device with caution.**