



BOTA CONGRESS 2025
LEEDS

Dibotermin alfa (BMP-2) use in revision surgery for fracture non-union

Miss Odiri Oniko MRCS, Mr John Ferns FRCS (Tr & Orth), Mr Asan Rafee FRCS (Tr & Orth)
Trauma and Orthopaedics Department, Salford Royal Hospital



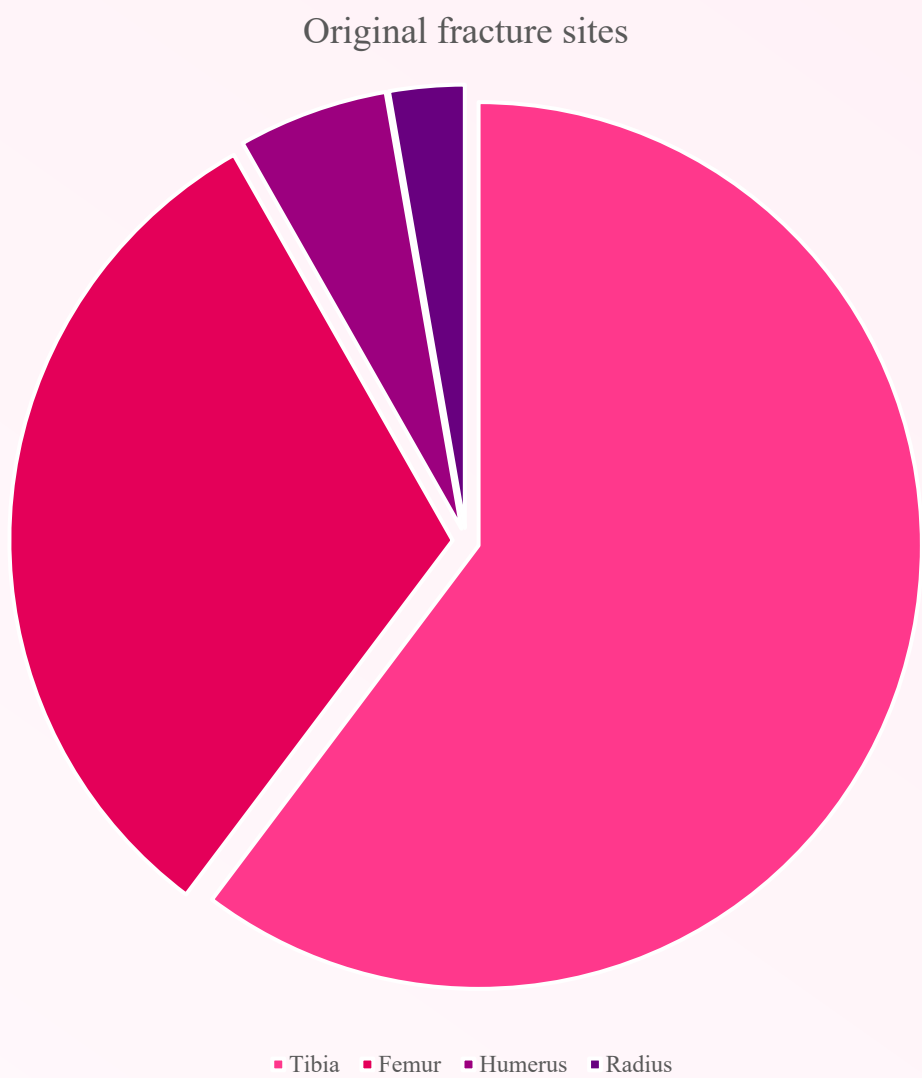
Introduction

- Non-union of fractures is a significant financial and healthcare burden, with a huge socioeconomic impact on patients and their families. It remains a major challenge in Trauma & Orthopaedic surgery, causing prolonged morbidity.
- BMP-2 (bone morphogenetic protein) is an osteoinductive agent that enhances bone healing. However, it is quite costly; therefore, its use requires judicious application.
- AIM: To demonstrate the usefulness of BMP-2 as a potential adjunct in revision surgery and to assess union rates and adherence to existing guidelines.
- NICE: No comprehensive guidelines or recommendations on the use of BMP, ABG (autologous bone graft) remains the gold standard.
- BOA: No guidelines on BMP as a first line but recommended as a valuable adjunct in complex cases, particularly after failed standard treatments.



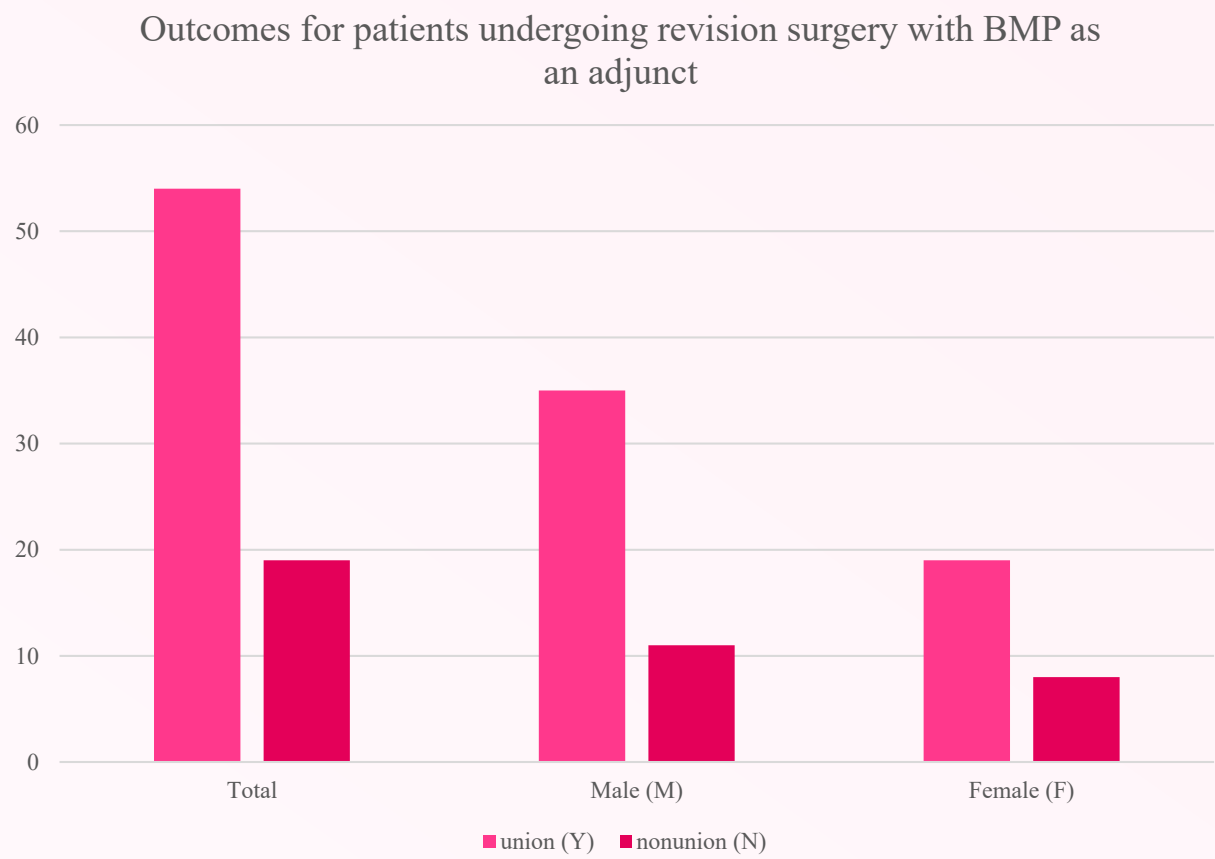
Methodology

- Design: Retrospective review (2019 – 2023)
- Inclusion criteria: 80 patients with long bone non union undergoing revision surgery with BMP-2.
- Data: demographics, socioeconomic factors, co-morbidities, fracture site and characteristics, original and revision fixation methods, post op infection and union outcome (confirmed radiologically)



Results

- Total patients: 80 (M:52 , F:29); mean age = 50yrs.
- BMP2 used in all cases, with or without bone graft (autograft, allograft or both)
- 73 patients had established outcomes (union or non union), 6 patients were lost to follow up and 1 died.
- UNION ACHIEVED IN 73.9% with an average time of 10 months (M: 76% average 8 months, F: 70% average 13 months)
- Sites: Tibia = 44, Femur = 23, Humerus = 4, Radius = 2.
- Diabetics and nondiabetics had similar union rates (75% vs 74%)
- Smokers' vs nonsmokers' union rate = 70% vs 76%
- Open and closed fractures had the same rate = 73%



Limitations

- Small sample size (81 patients)
- Retrospective design
- No control group
- No clear guidelines to compare to/ assess compliance
- Unclear timelines to define outcomes e.g some patients were reoperated on within 6 months due to "non union" while some surgeons waited longer than 18 months for union to be achieved.
- Multiple previous revision surgeries

Discussion

- There is limited cost effectiveness data.
- Adding dibotermin significantly increases the costs of treatment of non unions however, this is partially offset by the reduced number of secondary interventions, infection rates and outpatient clinic visits
- There is also a net incremental cost per quality adjusted life year gain due to faster healing times
- Cost analysis highlights need for clear selection criteria
- Future direction: implement standardized BMP request pro-forma and re-audit after 6–12 months.

Conclusion

- BMP achieved satisfactory union rates, including in adverse hosts.
- Supports its role as an adjunct in managing complex non-unions.
- There is a need to streamline indication criteria to optimise cost effectiveness and patient outcomes
- Action plan:** Introduce protocol checklist → education session for T&O team → **Re-audit scheduled [Month 2026]**

Key Learning points

- BMP is a valuable adjunct for biologically inactive non-unions when used appropriately.
- Regular audit of indications and outcomes is essential to ensure cost-effective practice.
- Establishing a standard protocol can reduce unnecessary BMP usage.

References

- NICE IPG 159 (2016) – BMP-7 for Non-union Fractures.
- BOA Standards for Trauma 2023.
- Giannoudis PV et al., Injury 2021; 52(3): S12-S20.