

Intraoperative Placement of Analgesic Calcium Sulfate Beads Speeds Postoperative Recovery in Thoracolumbar Spine Surgery: A Case-Matched Cohort Study

Vigneshh Kumar MD, Stephen S Burks MD, Michael Y Wang MD

Department of Neurological Surgery, University of Miami



Introduction

- Synthetic calcium sulfate beads serve as a vehicle for delayed release of medication into a surgical wound
- Bead size can be customized, allowing medication effect to last days to weeks, typically lasting 18-24 days
- This rapid degradation directly into a surgical wound has 3 benefits:
 1. Medication is released quickly in the postoperative period
 2. It reaches high concentrations in the local wound environment
 3. It is unlikely to cause systemic toxicity
- The use of beads in spine surgery is new: this study is the first to show analgesic beads speeds immediate postoperative recovery after spine surgery



Methods

- Beads consisted of 12 mg of morphine sulfate and 1 g of vancomycin powder mixed into a calcium sulfate base
- Beads were prepared immediately prior to placement
- Beads were placed within posterior spine incisions in the space of the paraspinal musculature deep to the fascia
- Pain scores, pain medication usage, and ambulation data were recorded postoperatively



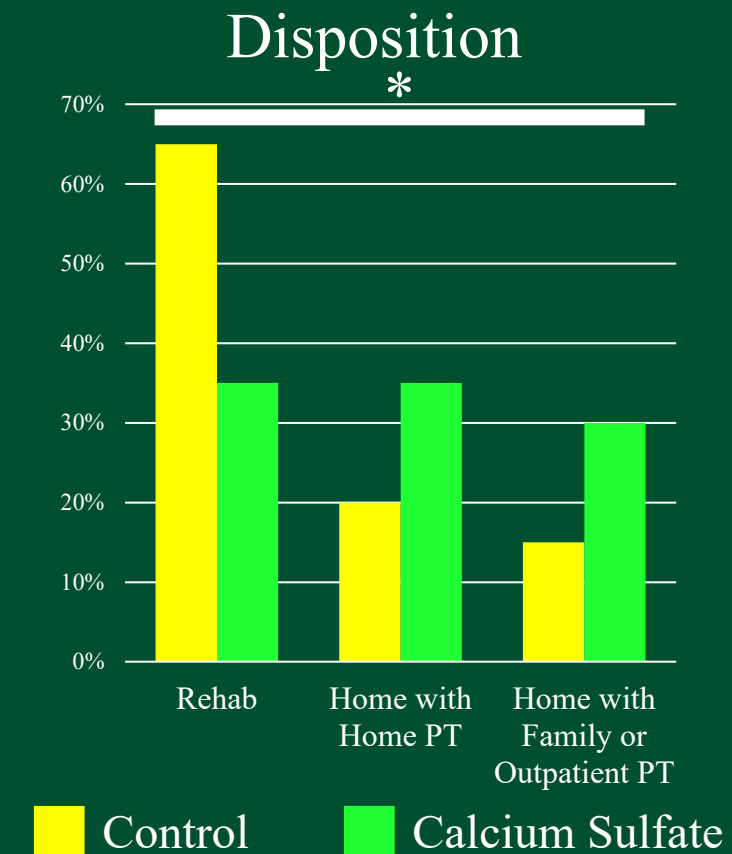
Results

- 20 patients were included in each group
- There were no differences in demographics, preoperative functional status, or surgical characteristics: number of levels performed, percentage of surgeries comprising revisions, percent of posterior-only versus multi-approach surgeries, or percent of surgeries using an interbody



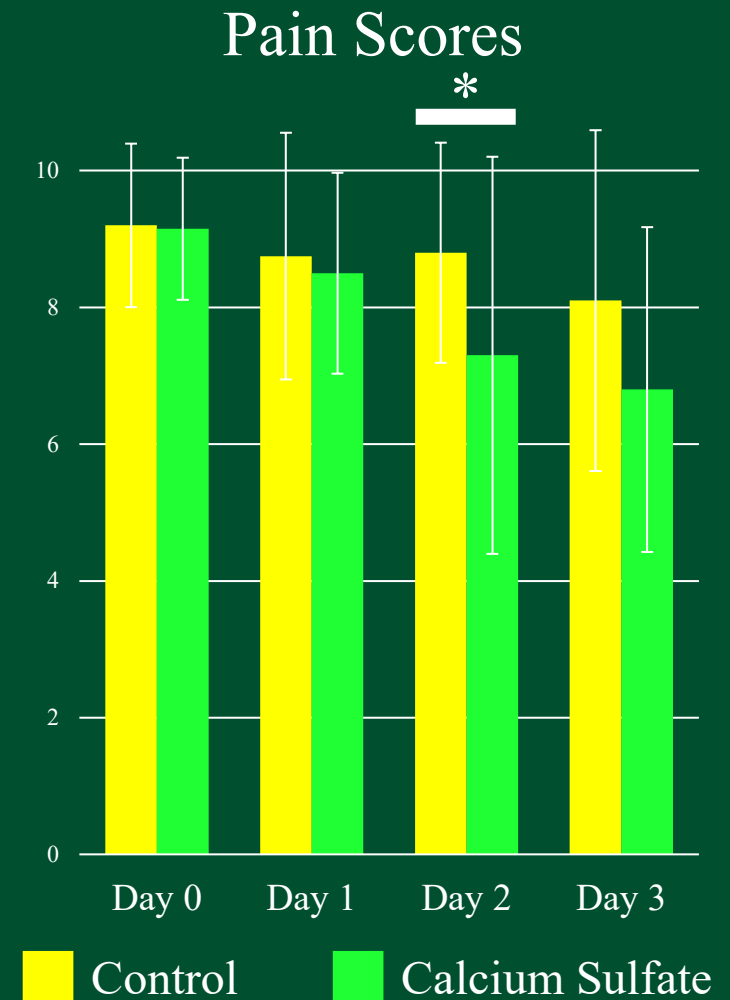
Results

- Patients in the calcium sulfate group had a one-day shorter length-of-stay (4.25) compared to the control group (5.60), $p=.012$
- A greater percentage of patients were discharged home in the calcium sulfate group (65.0%) than the control group (35.0%), $p=.018$



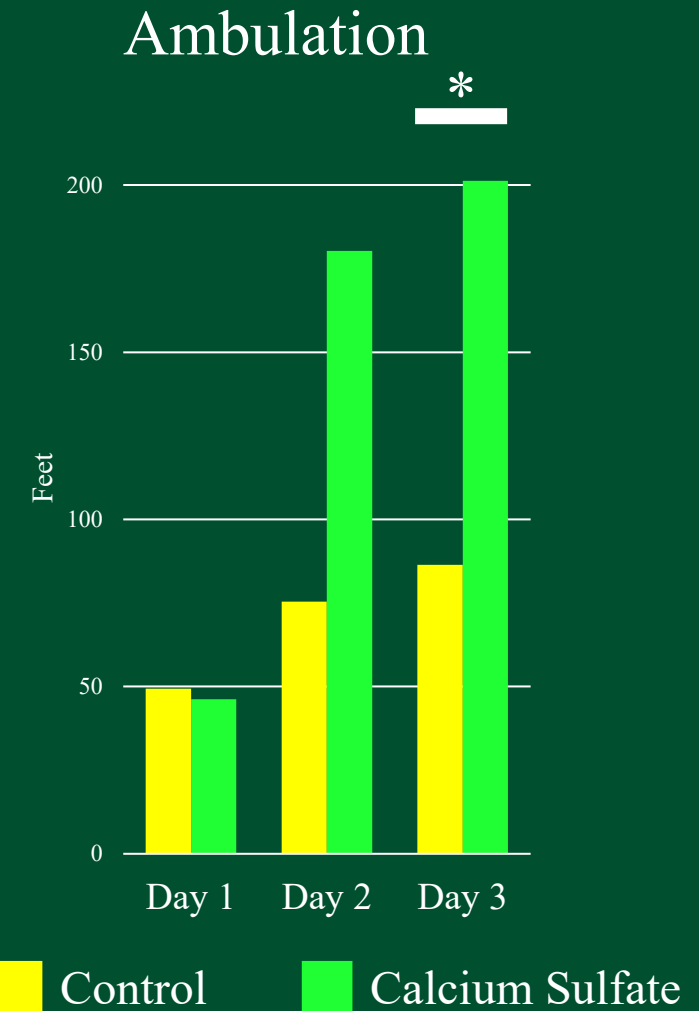
Results

- Patients in the calcium sulfate group reported better pain control throughout the postoperative period ($p=.050$ on postoperative day 2).



Results

- Patients in the calcium sulfate group ambulated a greater distance after postoperative day 1 ($p=.024$ on postoperative day 3)



Results

- Patients in the calcium sulfate group had less pain medication usage, although not significant.

