

RISK OF HYPERCALCEMIA FOLLOWING CALCIUM SULFATE BEAD IMPLANTATION IN DIABETIC FOOT INFECTIONS

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BACKGROUND

- Calcium sulfate (CaSO₄) beads are increasingly utilized for local antibiotic delivery and dead space management in diabetic foot infections (DFI).
- However, concerns persist regarding postoperative hypercalcemia following implantation.

AIM

- This study aimed to evaluate the incidence and magnitude of early postoperative changes in serum calcium in patients with DFI treated with antibiotic-loaded CaSO₄ beads.

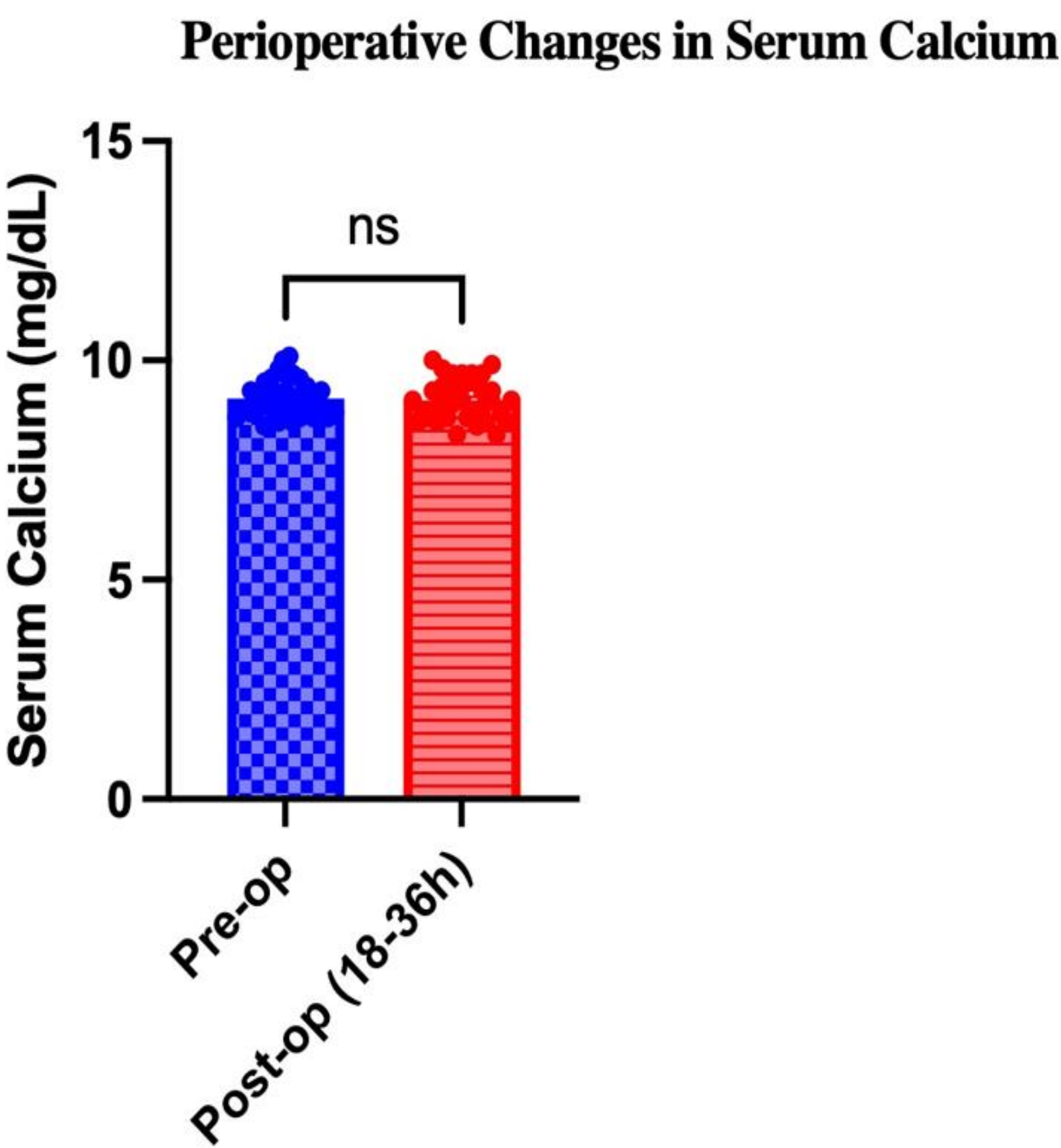
METHODS

- We conducted a retrospective review of adult patients with DFI who underwent surgical management with implantation of antibiotic-loaded CaSO₄ beads.
- Patients with available serum calcium levels preoperatively and within 18–36 hours postoperatively were included.
- Data collected included demographics, comorbidities, and serum calcium levels.
- The primary endpoint was the change in serum calcium from preoperative baseline to early postoperative levels.
- Hypercalcemia was defined as serum calcium >10.5 mg/dL. Paired t-test analysis was used to compare preoperative and postoperative calcium levels.

RESULTS

- A total of 35 patients met inclusion criteria. The mean preoperative serum calcium level was 9.13 ± 0.42 mg/dL, compared to 9.09 ± 0.47 mg/dL postoperatively (18–36 hours).
- The mean change in serum calcium was –0.04 mg/dL (95% CI: –0.10 to 0.02), with no statistically significant difference observed (*p* = 0.206) (Fig 1).

Fig.1



DISCUSSIONS & CONCLUSIONS

- In this cohort, the use of antibiotic-loaded CaSO₄ beads was not associated with a clinically meaningful increase in early postoperative serum calcium levels, supporting a favorable short-term safety profile.
- Although hypercalcemia has been reported in association with CaSO₄ implantation, it is thought to be influenced by factors such as bead volume, resorption kinetics, and patient-specific characteristics including renal function and baseline calcium metabolism.
- The lack of significant calcium elevation within the early postoperative window is reassuring, particularly in a medically complex DFI population. However, delayed calcium changes beyond 36 hours cannot be excluded and may warrant further evaluation.
- Limitations of this study include its retrospective design, small sample size, and lack of standardized data on bead volume and antibiotic composition.
- Overall, these findings support the continued use of CaSO₄ beads as a safe adjunct for local antibiotic delivery and dead space management in DFI, with a low risk of early postoperative hypercalcemia.
- Future prospective studies with larger cohorts and extended follow-up are needed to better characterize the temporal profile of calcium changes and identify patients at higher risk.

ACKNOWLEDGEMENTS

Illustrations made with GraphPad Prism