A NOVEL PROLIPOSOMAL ROPIVACAINE OIL: PHARMACOKINETIC–PHARMACODYNAMIC STUDIES AFTER SUBCUTANEOUS ADMINISTRATION IN PIGS

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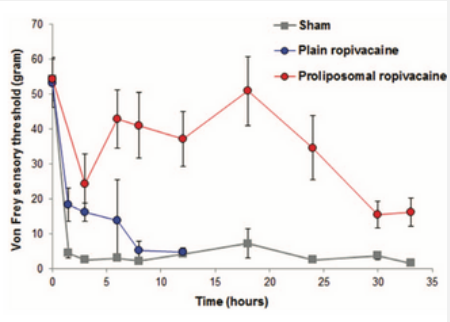
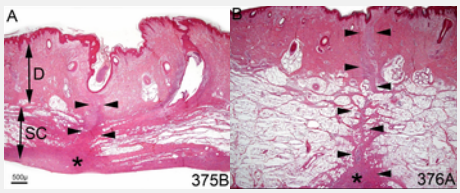
RESULTS



Pharmacodynamic data: von Frey sensory threshold measured at repeated intervals over time in 3 groups of pigs in a surgical incision model. Proliposomal ropivacaine provided sensory anesthesia in this model for up to 30 hours, compared with 6 hours for plain ropivacaine.



Wound healing histology: All incisions healed in both pig models. By day 14, a thin fibrous scar formed. Figure A shows the epidermis (red line), dermis (D), and subcutis (SC), while Figure B highlights a well-defined scar across the dermis and subcutis.

OBJECTIVES

This study aimed to evaluate the efficacy, pharmacokinetics, and safety of a novel proliposomal ropivacaine formulation, which generates liposomes in situ upon exposure to aqueous media, providing extended anesthesia and improved shelf stability compared to conventional liposomal formulations.

PRECLINICAL MODEL

Surgical Wound Porcine Model (Young Pigs): A long incision was made through the skin and fascia in the left flank and then sutured. Drugs were administered via subcutaneous injection into the fascial pockets on either side of the wound.
Surgical Wound Porcine Model (Adult Pigs): Long incisions were made, with one receiving subcutaneous injections into the fascial pocket below the closed surgical wound, while the other received direct intraoperative instillation into the open wound.
Pharmacodynamic and Pharmacokinetic Piglet Study: Tactile threshold was assessed using von Frey filaments applied to the surgical wounds.

Surgical wounds and injection sites were inspected and evaluated both clinically and histologically.

CONCLUSIONS

Proliposomal ropivacaine exerted prolonged anesthesia with delayed elimination, typical for liposomal drugs. All incisions were acceptably healed in both the single-incision piglet models and the multiple- incision large adult pig models. The advantage of this novel proliposomal ropivacaine is its ease of preparation and its extended shelf-stability (>2 years) at room temperature.

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