



# Remodeling Characteristics of Arthrex Quickset™ Preclinical Studies Comparing Arthrex Quickset™ vs. Norian® SRS

Arthrex Research and Development

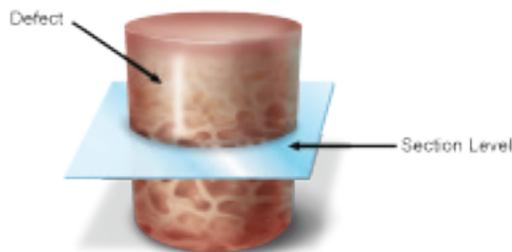
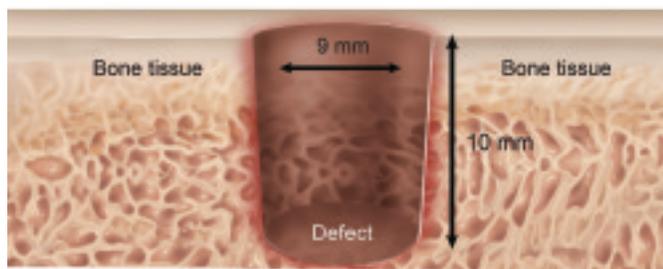
## Introduction

Arthrex Quickset™ is an injectable calcium phosphate featuring a full range of porosity including macroporosity (pore size greater than 100 µm).

The purpose of these studies was to evaluate the local tissue effects and the performance of two commercial bone void fillers, a second-generation calcium phosphate cement (Arthrex Quickset™) compared to a first-generation calcium phosphate bone cement (Norian®SRS).

## Study 1

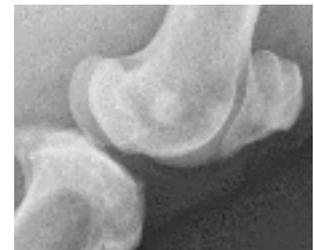
In this study, an intrasosseous implantation model with sheep was used by creating a 10 mm long and 9 mm diameter defect in sheep condyle (Good Laboratory Practice study report completed by NAMSA®). The defect was filled with either Arthrex Quickset or Norian® SRS, respectively. At 24 weeks postoperatively, the animals were euthanized and the sites were sampled (n=5 sites per product) as well as the local lymph nodes. The local tissue effects and the effects at the level of the draining lymph nodes were evaluated macroscopically and histologically. The performance (bone healing and material degradation) was evaluated by histopathological, fluorescent bone labeling and histomorphometrical analyses.



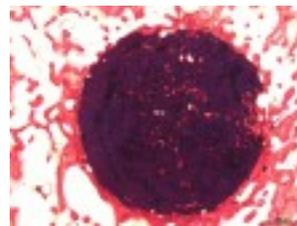
## Study 1 Results



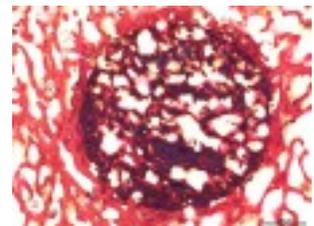
24 weeks postoperative  
X-ray - Norian® SRS



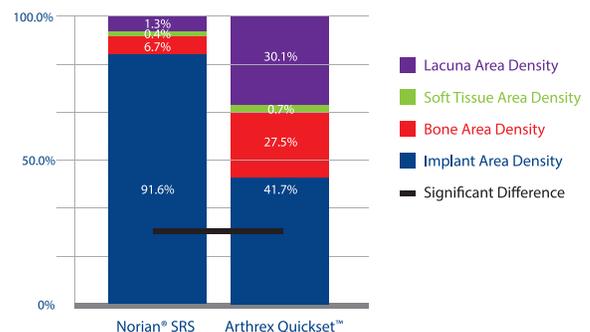
24 weeks postoperative  
X-ray - Arthrex Quickset™



24 weeks postoperative  
photomicrograph -  
Norian® SRS



24 weeks postoperative  
photomicrograph - Arthrex  
Quickset™



The results indicated no local adverse effects or significant signs of irritation or cytotoxicity in the surrounding tissues of the implanted sites and at the level of the draining lymph nodes. Arthrex Quickset showed histopathologically higher performance parameters than NorianSRS. Arthrex Quickset showed significantly higher degradation (implant area density) associated with higher osteoconduction (bone area density) for a better osteotransductive (material replacement by bone tissue) performance.

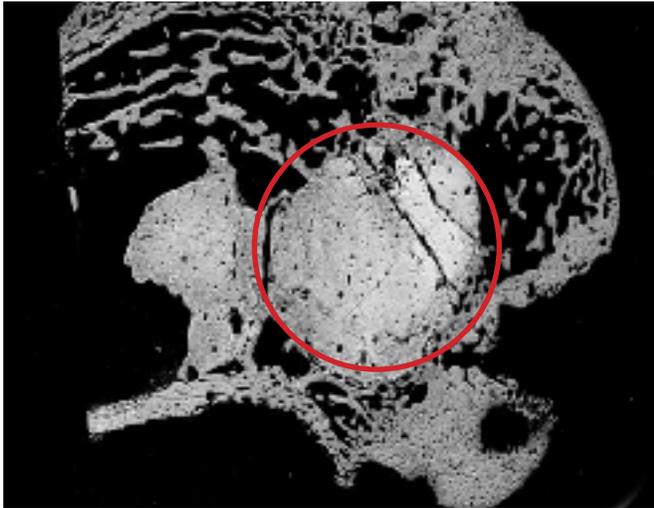
## Study 2

In this study, a critical-size bone defect model was used in the femoral lateral condyles of adult female New Zealand rabbits; this model was validated in Oniris at Nantes (National Veterinary School of Nantes, France). A cylindrical bone defect was created at the junction between the epiphysis and metaphysis. The defect was filled with Arthrex Quickset™ injectable calcium phosphate or Norian® SRS.

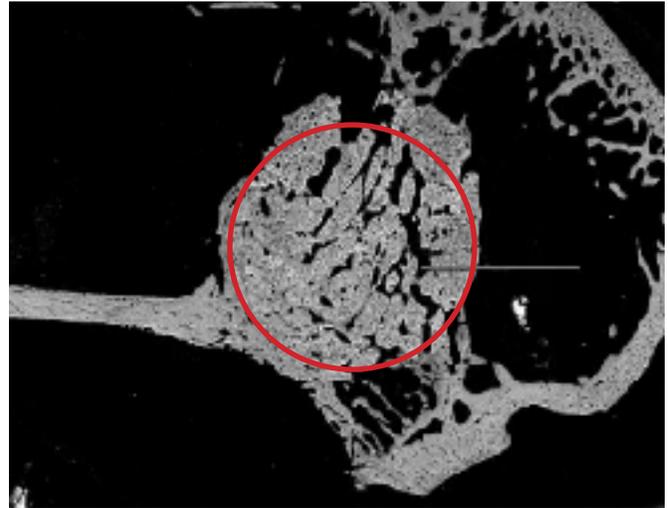


## Study 2 Results

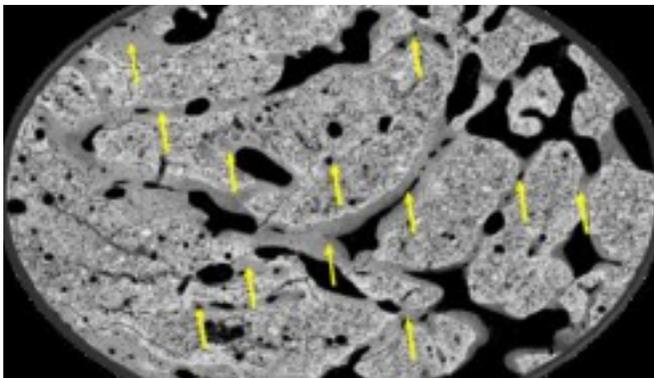
Histological data concerning the resorption/substitution process of Arthrex Quickset™ or Norian® SRS



8 weeks postoperative histology - Norian® SRS



8 weeks postoperative histology - Arthrex Quickset™



8 weeks postoperative histology - Arthrex Quickset™

The Arthrex Quickset injectable calcium phosphate demonstrated a good osteointegration and bone resorption/substitution at the center of the implant. Yellow arrows indicate the new bone formation.

The Norian® SRS is very dense and bone ingrowth inside the biomaterial is very limited after 8 weeks.

Arthrex Quickset and Norian® SRS are both showing good osteointegration. Arthrex Quickset shows a higher rate of resorption/substitution due to its porosity and permeability to bone cells.

## Conclusion

Macroporosity and permeability properties are essential to fluids and bone cell penetration and circulation, and consequently full remodeling of the biomaterial. Due to its porous structure, Arthrex Quickset promotes the remodeling to a larger extent than Norian® SRS.

*Disclaimer: The above mentioned studies have been carried out as contract research. Only extracts of the research are published in this paper. Quickset™ owned by Graftys, S.A.*