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Introduction

Shoulder osteochondritis dissecans (OCD) is a common orthopedic disorder in large, fast-growing dogs. It causes pain, lameness, and progressive joint degeneration. Surgical treatment is required but current options have limitations. Curettage leads to fibrocartilage of poor quality. Osteochondral autograft transplantation is limited by donor site morbidity and lesion size. Resurfacing implants may cause wear, instability, or inflammatory reactions depending on the material. Bioceramic are highly biocompatible, resistant, and show low wear. Their use is well established in human orthopedics and is emerging in veterinary medicine. This study evaluates the feasibility, safety, and short-term outcomes of a novel biphasic bioceramic implant for treating humeral head OCD in dogs.

Materials and Methods

Study design

- Prospective clinical study
- Five client-owned dogs (six shoulders) with forelimb lameness due to humeral head OCD

Diagnosis & Inclusion criteria

- Confirmed by clinical exam, radiography, and CT
- Single humeral head OCD lesion
- Lesion diameter ≤ 12 mm
- No concurrent joint disease or systemic illness
- Informed owner consent

Implant

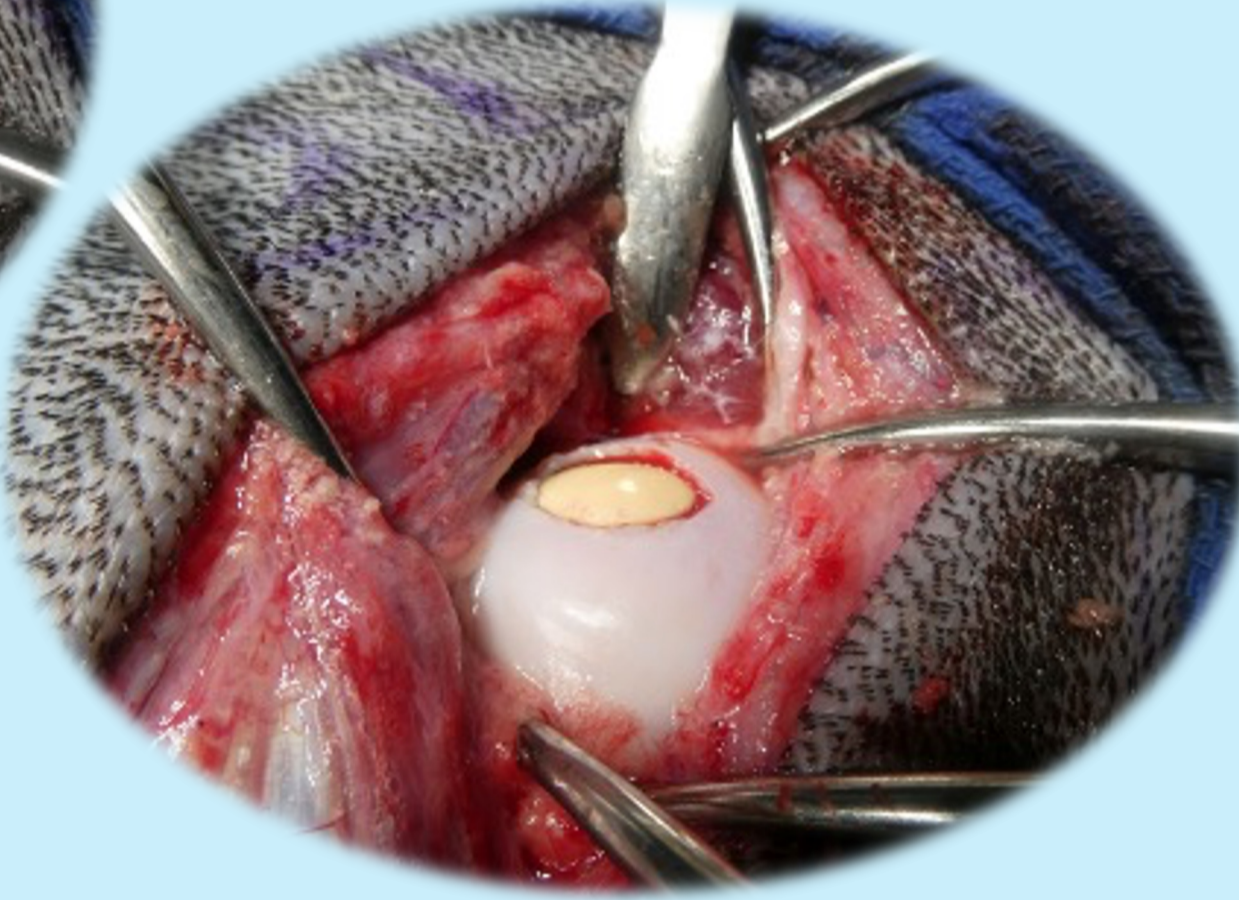
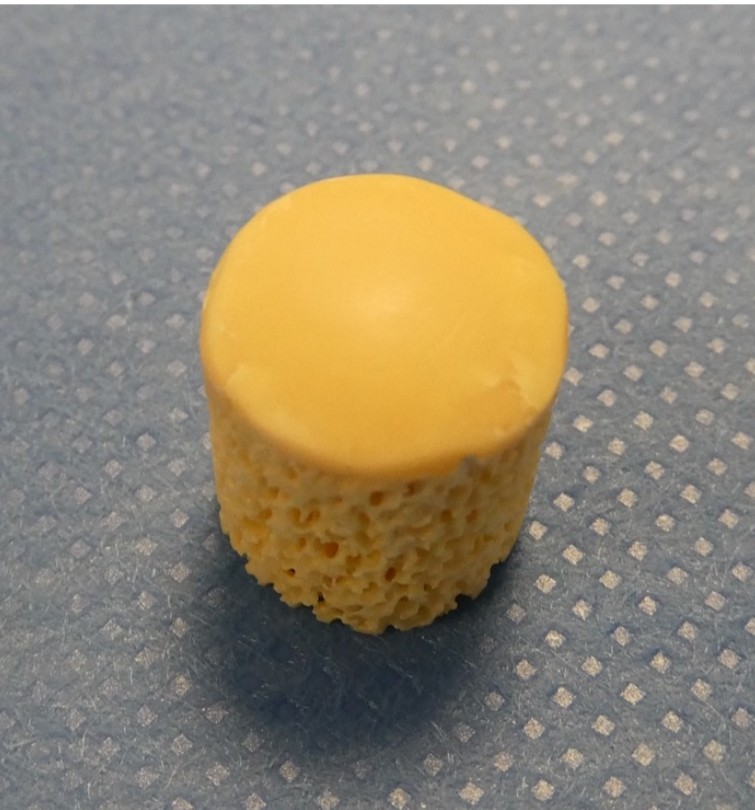
- Novel biphasic bioceramic device (Icéram®)
- Porous alumina for osteointegration
- Dense, smooth surface mimicking articular cartilage
- Designed for intra-articular use, providing support and minimizing wear/inflammation

Surgical procedure

- Performed under general anesthesia via craniolateral approach
- OCD lesion debridement and preparation with custom reamer
- Press-fit implant placement flush with surrounding cartilage
- No prophylactic postoperative antibiotics
- Standard analgesia and activity restriction

Postoperative evaluation

- Clinical and radiographic follow-up at days 15, 30, and 90
- Lameness scored on 0–5 scale
- Radiographs assessed for implant position, loosening, and OA progression
- Complications (intra- and postoperative) recorded



Results

Study population

- 5 dogs (6 shoulders): Beauceron (n=2), Border Collie (n=2), Bernese Mountain Dog (n=1)
- Age: 9–23 months
- Weight: 15–39 kg
- Lesion size: 4–12 mm (median 7.7 mm)
- One dog treated bilaterally

Complications

- Intraoperative: 1 humeral head fracture during implant insertion (large lesion:12 mm) → stabilized with 2 screws, implant not used
- Postoperative: 1 case of bicipital tendinopathy (resolved with NSAIDs)
- No infection, local inflammation, implant instability, migration, or periprosthetic lysis observed

Clinical outcomes

- Preoperative lameness: grade 3/5 to 4/5
- Day 90:
 - 3 dogs → normal gait (0/5)
 - 2 dogs → mild intermittent lameness (1/5) during intense activity
 - Humeral fracture case → mild intermittent lameness
 - Bicipital tendinopathy case → lameness resolved after treatment

Radiographic outcomes

- Stable implant positioning
- No implant migration, loosening, or progressive OA changes
- Bone integration observed around porous ceramic structure
- Joint surface congruent in all evaluable cases



Discussion

Feasibility & safety

- Biphasic bioceramic implant well tolerated
- Significant short-term clinical improvement in most cases
- No major infectious or inflammatory complications, despite no postoperative antibiotics
- Supports potential to reduce reliance on systemic antimicrobial prophylaxis

Implant design & properties

- Biphasic structure: porous alumina for bone ingrowth + dense surface for articulation
- Advantages over polycarbonate urethane implants (wear, degradation)
- Ceramics provide durability, low friction, resistance to deformation
- May help prevent synovitis and osteoarthritis (longer-term data needed)

Integration & complications

- No implant loosening, failure, or radiographic instability observed
- Good early bone integration and joint congruency
- One intraoperative fracture highlights need for careful planning in large/fragile lesions

Study limitations

- Small sample size
- Short follow-up (90 days)
- No control group or comparison with standard techniques (OAT, synthetic resurfacing)

Perspectives

- Promising short-term results
- Bioceramic implant shows strong potential for veterinary joint repair
- Larger, controlled, long-term studies needed to confirm benefits and durability

Conclusion

This preliminary study shows that a biphasic bioceramic implant is feasible and safe for treating humeral head OCD in dogs, providing good short-term clinical outcomes without postoperative antibiotics. No implant loosening, infection, or inflammation was observed. Larger, long-term studies are needed, but bioceramics show strong potential for intra-articular use in veterinary orthopedics.

