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Osteoinductive Calcium Phosphate Bioceramics for the Treatment of Bone Defects in Recurrent Anterior Shoulder Dislocation

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Introduction and Background

Glenoid bone grafting is a core surgical technique for treating recurrent anterior shoulder dislocation accompanied by significant bone defects, aiming to restore the glenoid anatomy and stability. Current primary methods include autologous bone grafting, allogeneic bone grafting, and artificial bone grafting. Autologous bone grafting can, to varying degrees, affect the donor site. Allogeneic bone grafting faces the challenge of donor shortage in our country. Therefore, artificial bone grafting represents the future direction of development.

Material and Method

Osteoinductive calcium phosphate bioceramics is a material with excellent biocompatibility and osteoinductive properties, widely used in the fields of bone tissue engineering and regenerative medicine.

Since January 2025, our research team has been exploring the use of osteoinductive calcium phosphate bioceramics to treat anterior glenoid bone defects in recurrent anterior shoulder dislocation. This approach is combined with Bankart repair, Remplissage procedure, and long head of biceps tendon transfer technique to restore shoulder joint stability.

Results

To date, none of the 12 patients under follow-up have experienced re-dislocation postoperatively. Both UCLA and ASES scores showed significant improvement at the three-month and six-month postoperative marks. Postoperative CT scans confirmed new bone formation at the site of the artificial glenoid graft, along with some degree of remodeling, providing reliable assurance for anterior shoulder stability.

Conclusions

The local implantation of osteoinductive calcium phosphate bioceramics offers a new approach for treating bone defects in recurrent anterior shoulder dislocation. Longer-term follow-up and continued expansion of the sample size are required to further validate the osteoinductive efficacy of these bioceramics in managing bone defects associated with recurrent anterior shoulder dislocation.

