

# Indications For Bone Allografts In The Treatment Of Benign Bone Tumors Of The Upper Limb: A Study Of 28 Cases

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## Abstract

Benign bone tumors are non-malignant neoplasms that can affect all parts of the skeletal system. Surgical treatment remains the primary approach. The first stage of surgical treatment may involve:

- A simple or wide excision for extraosseous tumors
- Curettage

The second stage involves bone reconstruction (filling). Usable materials include autografts, allografts, and bone substitutes.

The objective of our study is to demonstrate the benefit of using bone allografts in cases of bone substance loss due to tumors.

This is a prospective, single-center study over a period of seven years, involving 28 cases: 12 men and 16 women, with an average age of 32 years.

Diagnosis was based on clinical examination and radiology, using the TOD classification (Type-Bone-Dimension) for bone substance loss. Histological types in our study included: chondroma (16 cases), benign giant cell tumor (3 cases), simple bone cyst (4 cases), aneurysmal cyst (2 cases), Osteoid osteoma (2 cases), Chondroblastoma (1 case)

Treatment involved curettage with filling using bone allografts (cryopreserved femoral heads).

Results after an average follow-up of 46 months showed: Bone integration in 22 cases, Partial lysis in 4 cases, Total lysis in 2 case

In conclusion, benign bone tumors are generally well-evolving lesions but may become serious in complicated forms (growth disorders, bone deformities, malignant transformation). Surgical treatment should remain the primary approach, and recurrence is a complication of incomplete resection.

**Keywords:** allograft, bone bank, benign bone tumor, reconstruction

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## I. Introduction:

The treatment of benign tumors involves either monitoring or surgical excision. The first stage of surgical treatment may include:

A simple or wide excision for extraosseous tumors, which involves monobloc resection of the tumor. Curettage, an intralesional surgery where the tumor is entered and its contents are removed. The second stage is bone reconstruction (filling).

Materials that can be used include: autografts, allografts, and bone substitutes.

The objective of our study is to demonstrate the benefits of using bone allografts in cases of bone substance loss caused by tumors.

## II. Materials And Methods:

This is a prospective study conducted over seven years, involving a series of 28 patients who had segmental or cavitory bone substance loss of tumor origin in the upper limb (benign tumors). These patients underwent bone reconstruction using cryopreserved femoral head allografts.

The study includes 28 patients, consisting of 12 men and 16 women, with an average age of 32 years. Tumor location was as follows: 6 cases in the humerus, 6 cases in the forearm, and 16 cases in the hand. Diagnosis was based on clinical examination and radiological imaging.

We used the TOD classification (Type-Bone-Dimension), defined by the Association for the Study of Tissue Grafts and Substitutes in Orthopedics (GESTO) (Figure 1).

This classification is based on three criteria:

Type of bone substance loss

The bone that borders the cavity and will be in contact with the substitute Dimension of the bone substance loss



**Figure 1: TOD Classification**

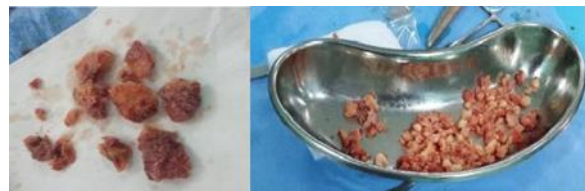
The histological types observed in our series were as follows:

Chondroma: 16 cases

Benign giant cell tumor (GCT): 3 cases Simple bone cyst: 4 cases

Aneurysmal bone cyst: 2 cases Osteoid osteoma: 2 cases Chondroblastoma: 1 case

Treatment involved curettage followed by filling with cryopreserved femoral head bone allografts (Figure 2).



**Figure 2: Bone Allograft**

### III. Results:

Histological analysis following surgical curettage confirmed the initial diagnosis. Evaluation focused on radiological progression (osteointegration, partial or total lysis). After an average follow-up of 46 months, the results were as follows:

Osteointegration in 22 cases (Figure 3) Partial lysis in 4 cases (Figure 4)

Total lysis in 2 cases, which were surgically revised with a wide resection



**Figure 3: Osteointegration**



**Figure 4: Total lysis**

#### **IV. Discussion:**

Bone grafts are a key component of the therapeutic arsenal in musculoskeletal surgery. The properties of these various human tissues are well documented.

Autografts remain the gold standard in grafting techniques, contrasting with allografts.

The latter are devitalized due to preservation methods, whether through freezing or lyophilization.

This preservation occurs in specialized facilities known as tissue banks, whose activities are regulated by law. The ability to preserve tissue post-harvest provides the advantage of offering suitable reconstruction materials for the musculoskeletal system, allowing for various surgical applications.

#### **V. Conclusion:**

Bone allografts are essential in the therapeutic repertoire of surgeons. They can effectively restore the patient's anatomy. While allografts may present more complications during the initial months post-surgery, once this critical period is well managed, their outcomes appear to stabilize over time, yielding satisfactory functional results.

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