



## RESEARCH ARTICLE

### STUDY OF TREATMENT WITH LYOPHILIZED BONE GRAFTING IN BENIGN LITHIC BONE TUMORS: CASE SERIES

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#### ABSTRACT

Any bone defect of a limb affects the functional capacity of the body segment in this situation, doctors specializing in traumatology and orthopedics have faced, for which it is imperative to evaluate the safety and effectiveness of the use of lyophilized allograft. We understand by benignity, when the tumor is made up of cells of the size, type and characteristics of those of the normal tissue from which they originate, they are circumscribed, encapsulated and do not invade neighboring structures. A descriptive study was carried out since it is important due to its low prevalence to organize the data of the experience that has been had in this medical center with respect to this condition and the use of bone graft for the treatment of this type of injury that, although not are common they can have important sequelae in the functionality of the patient and to carry out the activities of their daily life. A total of 32 patients were obtained, of which 4 were eliminated because they did not meet the inclusion criteria, 21% were in the upper limb, 71% in the lower limb and 7% in the chest respectively, the histopathological diagnoses found that 29% of the patients presented an enchondroma, 25% presented simple bone cyst, fibrous dysplasia in 7% and osteochondroma in 39%, 14% presented chronic post-surgical pain, did not present infections, all recovered functional mobility and 93% of them recovered their complete mobility of the affected limb, which demonstrates their effectiveness and safety.

#### INTRODUCTION

Benign bone tumors such as giant cell tumors (simple bone cyst, enchondroma (EC), chondroblastoma) and aneurysmal bone cyst (Osteoclasts that tend to mature and are generally well defined with respect to the neighboring tissues, some of them tend to cause bone lithic lesions, surgical treatment is usually indicated in lesions with a high risk of pathological fracture, or with recurrent lesions and a complete resection guarantees their healing without recurrence. (2) Bony lithic lesions are tumor lesions where there has been destruction of bone tissue, therefore the structure does not have the same resistance as healthy bone and therefore tends to fracture, (4) these fractures are considered pathological, since the mechanism of the injury does not coincide with the type of fracture or the affected bone. (3) Any bone defect of a limb, affects the functional capacity of the body segment, this situation has been faced by doctors of yesteryear up to the present and many researchers have struggled to find a solution. (2). The diagnosis of bone tumors and lithic lesions is based on obtaining data and the interrelation of symptoms, images and pathological anatomy, supplementing with clinical data in the areas of biochemistry and hematology. (1)

Among the treatment options for benign bone lesions include curettage and application of a graft in the resulting defect with or without osteosynthesis, many studies recommend the use of autologous graft and allograft. (1,2,4-8) Some recent in vivo studies or in vitro report the efficacy of the use of synthetic bone substitute in the reconstruction of bone defects after curettage of benign lesions (9,10). In this retrospective study, we will describe the results of the use of lyophilized allograft for the treatment of benign lithic bone lesions with curettage and subsequent lyophilized bone allograft implantation.

#### MATERIALS AND METHODS

##### INFORMATION COLLECTION METHODS

The project was authorized and endorsed by the bioethics committee of the Naval Medical Center (number R- 021/2019) to Method. Data collection was carried out in the file of patients who meet the inclusion criteria, with prior informed consent in accordance with the health research standard to carry out the research.

##### Technique

##### Review of records

**Instrument:** Montoya radiographic scale

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Description of the instrument. For the collection of a sheet intended for the purpose of central measurement trends was used.

## RESULTS

A total of 32 patients were obtained, of which 4 were eliminated for not meeting the inclusion criteria, with respect to age groups we found that 39% of the patients were between 1 to 19 years old, 36% with Regarding 20 to 39 years and over 40 years, we found 36% with a mean age of 20.4 years, the average follow-up of the patients was 8 months, an average surgical time of 1.2 hours, no post-operative fractures were reported, the Average volume of the lesions was 55.3 mm<sup>3</sup>, with an average diameter of 5.4 cm, on average 36,384 patients were treated with a real prevalence of 0.77% of the disease at the time of the study, the average consolidation of the patients was 6.2 months, of which 25% were male and 64% female, the result regarding the affected anatomical region was found that 21% was in the upper limb, 71% in the lower limb and 7% in the thorax respectively, with respect to the histopathological diagnoses. icos we found that 29% of the patients presented an enchondroma, 25% presented simple bone cyst, fibrous dysplasia in 7% and osteochondroma in 39%, the affected bone we found that 50% was warm, 4% for phalanx, 7% for humerus, 11% for scapula and 29% for femur, 14% had chronic post-surgical pain, there were no infections and all recovered functional mobility; 93% of them recovered their complete mobility of the affected limb, time of consolidation we found that at 4 weeks 68% of our patients found consolidation grade I on the Montoya scale at 6 months they present a degree of consolidation grade IV a 43% and at 8 months 64%.

## DISCUSSION

The purpose of this study is to report the results of treatment with lyophilized bone graft of patients with lithic lesions as a result of benign bone tumors, although we are talking about a rare condition, it is important to emphasize that it can leave important functional sequelae as well as risk of fractures and increasingly bloody interventions with the risks of surgical interventions in fractures, which were subjected to surgical procedures with curettage plus allograft placement. We did not observe recurrences during our study of the 2-year-old evaluated patients, who were successfully treated with allograft, without presenting infectious complications. In our study there was no indication for the use of osteosynthesis since most were young patients with no history of concomitant disease. We did not report other types of complications during the follow-up of these patients in the outpatient clinic. In this study, the surgical approach depended on the location of the injury, the vessels and other structures involved, the approach had to be carefully planned to avoid complications such as neurovascular injuries. Nakamura et al. (33) Reported 13 patients with benign lithic lesions treated with lyophilized allograft, reported a blood order of 1088 ml, the average surgery time was 167 minutes, and reported superficial infections and chronic pain in 1 patient. Kundu et al. (37) conducted a study without the use of substitute material for the filling of lytic lesions in a patient with an average age of 28 years with a follow-up of 26 months, his most common histological type was the giant cell tumor followed by the cyst simple, aneurysmal cyst, in eonchondroma, and fibrous dysplasia, the maximum diameter for the lesions was 5.1 cm

and the average volume of the lesions was 34.5, none of their patients had sympathetic processes, however two of them with tumors of Giant cells had recurrence and a patient with a postoperative fracture reported, his radiographic follow-up only small lesions smaller than 70 cm<sup>3</sup> were completely repaired with bone and the rest tended to repair with septa throughout the lesion. Their results could support the use because precisely the main objective of the use of the bone graft is to avoid fractures in lytic lesions of any size, our work supports its support since none of our patients had post-operative complications or fractures, even though the majority of our patients had lesions smaller than 70 cm<sup>3</sup>. We are talking about a condition that is not common, however the treatment is a complex process in which special care must be taken due to the risk of fractures and recurrences that lead to increasingly large interventions and limitation of function in the affected limbs.

The objective was to evaluate the results, which were good for our study, and in terms of safety and efficacy, the results can be translated, although the number of patients was small, different treatment options such as local drug infiltration or cryoablation have also been reported. However, with these procedures there was a much greater theoretical risk that the ossification would be with septa and not with normal bone filling, in addition to a much higher theoretical risk of fractures since the defect is not replaced by some structure that can partially supporting loads, however the lyophilized allograft substitute provides a scaffold for cell migration and healthy bone repositioning. It is important to organize and group our experience in order to contribute to scientific knowledge to support decision-making.

## Conclusion

The use of lyophilized bone graft in lytic bone lesions in benign tumors is safe in terms of post-operative complications, which were not reported in our study population, as well as not leaving functional sequelae, and it is effective since consolidation was reported in all patients. in the expected time without leaving sequelae in the bone parenchyma of the treated lesions, for which it achieves its objective. However, our population sample is small and limits external validity to a certain extent. However, organize and present the results that we have obtained from the The experience of the use of lyophilized graft in lytic lesions provides data for future systematic reviews, we are talking about a rare condition, however of great relevance, since it occurs in patients of productive age and, economically, prevention is a much better investment.

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