10745 - Bone-In-Bone Allograft In Benign Bone Tumors

Carlos E. Cuervo Lozano M.D , Adriana Hernández López M.D

Orthopedic and Trauma Surgery Department, Hospital Universitario “José E. González” – Universidad Autónoma de Nuevo León

Purposes:

To show the superior integration rate of bone allografts used in large defects caused by benign bone tumors when placed within the hostage bone, taking advantage of the biological scaffold created by the tumor curettage.

Compare the results of the bone-in-bone technique with a group of patients treated with curettage and cancellous bone chips allograft in terms of recurrence and integration rate in benign bone tumors.

Background:

Management of residual bone defects posterior to the treatment of benign bone tumors represent a challenge. Bone defects can be classified on whether they are small or large depending on the relationship between the involved bone segment and the bone loss length as follows: 3 cm for the arm, 5 cm for femur and tibia and 6 cm for the humerus. The management goal for this kind of lesions is to successfully curette the tumor, and to strengthen the segment, thus preventing pathological fractures.

When the frozen allografts are implanted inside the scaffold created by the tumor curetting, some of the autogenous tissue advantages are present. Because of the preservation of the cortical bone during curettage, the vascular supply to the distal segment is practically unaltered, which promotes the allograft integration and by doing so, lowering the risk of complications.

Patients and methods:

This is a retrospective case-series study which included patients ages 1 month to 90 years diagnosed with a benign bone tumor that where treated with a bone-in-bone allograft. All the patients were treated with curettage, frozen nitrogen and allograft placement. The patients were diagnosed both clinically and radiologically with benign bone tumors prior to the procedure and the diagnosis was confirmed by the histologic evaluation of the piece. Follow up consisted in postop visits at week 2, 4, 6 and after that of monthly visits until clearance, in which X-rays were taken and evaluated with the allograft radiographic evaluation scale. The patients were compared to a similar group of patients with aneurysmatic and simple bone cysts treated with allograft chips. Statistical analysis was made with IBM SPSS versión 20 (SPSS, Inc.,Armon,NY) using Chi Square and unconditional logistic regression. The results are expressed in mean (±) standard deviation (range) or number (%) with a P value of 0.005.

Results:

We examined the results in 16 patients with confirmed benign bone tumors that where treated with a bone-in-bone allograft in addition to the standard curettage and frozen nitrogen who had a big defect as previously defined. There were 18 recorded procedures, and only one patient needed 3 bone-in-bone

procedures in different locations in the same surgical time. The location of the defects are tailed in table 1 and the diagnosis are detailed in Table 2. The average length of the allograft depended upon the location of the defect, the mean was 8.1 cm, distributed as follows: sternum 6 cm, distal femur (6.4 cm), proximal femur (11.9 cm), humerus (8.3cm), distal radius (5.4 cm), ulna (4 cm), proximal tibia (8.4 cm) and distal tibia (11.6 cm). The average follow-up was 12 months (48 $\pm$ 6 months). and we have had 0% recurrences or complications both wound and bone related. Compared to a previous study involving patients treated with curettage and cancellous bone chips allograft, we observed that in the curettage + cancellous chips there was a 56% complication rate, including a 40% chance on residual cyst and recurrence, as well as a 10% chance of partial or incomplete consolidation. The time until integration was similar in both groups (8.2 weeks in bone-in-bone group vs 8.8 in chips group), with a p value of 0.034.

Table 1

Location	**procedures (n)**
Sternum	1
Distal femur	2
Proximal femur	1
Humerus	3
Distal radius	4
Ulna	1
Proximal tibia	3
Distal tibia	2

Table 2

Diagnosis	**patients (n)**
Simple bone cyst	3
Aneurysmatic bone cyst (ABC)	7
Giant cell tumor (GCT)	4
Hyperparathyroidism	1

Conclusions:

In conclusion, the patients that had the bone-in-bone procedure had a better result in terms of prognosis, recurrence and integration rate in comparison to those in which cancellous chips were placed. Until the time this abstract was written, there were no reports regarding complications in the bone-in-bone group, representing a viable treatment for patients with benign bone tumors with considerable residual bone loss. Because the integration time is similar to the cancellous chips, there is still room for improving, this means either by looking for better integration catalysts and improving residual bone quality. The current trend in this subject is also using mesenchymal or stem cells to cover the allograft, as they promote the integration of the segment as well.