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Treatment of Unicameral Bone Cysts by Curettage and Packing with Plaster-of-Paris Pellets

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ABSTRACT: Long-term follow-up of twenty-six patients with unicameral bone cysts treated by curettage and packing with plaster-of-Paris pellets showed a recurrence in only two cases and no serious complications.

While there is agreement that the best material for packing defects remaining after the curettage of a uni-

by thorough curettage, followed by packing with pellets of sterile plaster of Paris. This report is the summary of our experience.

Dreesmann, working in Trendelenburg's clinic in Bonn, first introduced the use of plaster of Paris (CaSO_4) as a material for packing bone defects in 1892. Since then, this material has had wide clinical application, especially in the treatment of infected cavities⁹⁻¹⁷. Animal experi-

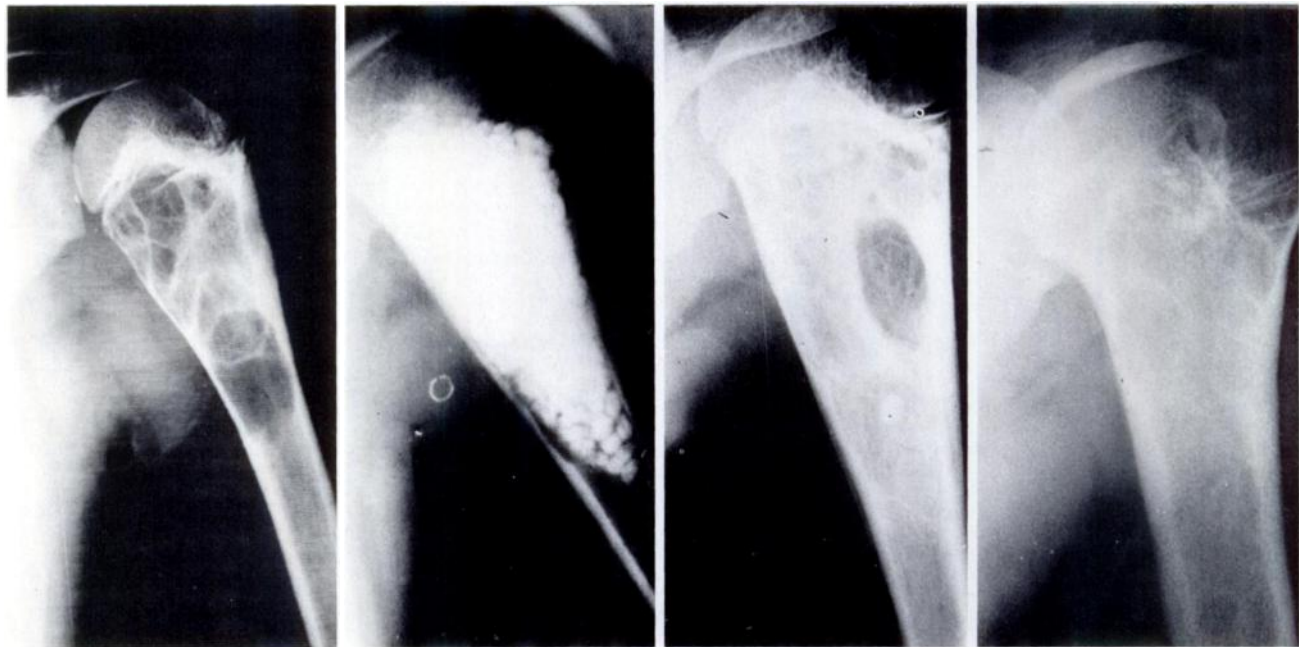


FIG. 1-A

FIG. 1-B

FIG. 1-C

FIG. 1-D

Figs. 1-A through 1-D: Roentgenograms of the humerus of a twelve-year-old boy.
Fig. 1-A: Large cyst of the humerus.
Fig. 1-B: Cyst filled with plaster-of-Paris pellets.
Fig. 1-C: One year after operation.
Fig. 1-D: Three years after operation.

cameral bone cyst is fresh autogenous bone grafts^{2-4,12,15,24}, the large size of most of the defects and the small size of most of the patients often makes this solution impractical or ill advised. This has led to the use of procedures not requiring grafts^{13,20} or to the use of substitutes for fresh autogenous bone grafts such as allografts or xenografts^{1,6,16,21}. These alternatives have not given uniformly good results^{2,5,12,16,21,23}. It has been our practice during the past twenty years to treat unicameral bone cysts

ments have shown that the plaster of Paris is absorbed and that the cavity fills in with new bone^{7,18,19,22}. As a material for packing bone cavities, plaster of Paris has many excellent properties. It is cheap, readily available, simple to fabricate into rods and pellets, and easy to sterilize^{10,11,14}. It has a shelf-life of at least several years. It is radiopaque and one can monitor its disappearance on roentgenograms as an indication of its absorption. It generally is well tolerated by tissue and its use usually is not accompanied by local inflammation or foreign-body reaction. In the presence of infection, the plaster of Paris liquefies and can easily be evacuated. We have used it extensively¹⁷ to pack

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TABLE I
EXPERIENCE WITH TWENTY-SIX PATIENTS WITH UNICAMERAL BONE CYSTS TREATED BY CURETTAGE
AND PACKING WITH PLASTER-OF-PARIS PELLETS

Case	Age (Yrs.)	Sex	Location	State of Cyst	Time to Consolidation (Mos.)	Complications
1	10	M	Humerus	M	3	—
2	2	F	Humerus	I	3	—
3	11	M	Humerus	M	3	—
4	7	M	Humerus	I	—	Partial recurrence
5	7	M	Femur	I	5	—
6	12	M	Humerus	R-I	5	—
7	12	M	Humerus	I	4	—
8	14	M	Calcaneus		3	—
9	12	M	Radius	M	5	—
10	8	M	Humerus	M	3	—
11	2	F	Radius	M	4	—
12	8	M	Humerus	M	3	—
13	6	M	Humerus	M	5	—
14	11	M	Humerus	M	—	Drained (see text)
15	6	M	Humerus	I	3	—
16	9	M	Femur	I	—	Drained (see text)
17	4	F	Humerus	M	2	—
18	10	F	Femur	M	4	—
19	14	F	Humerus	M	3	—
20	10	F	Femur	R	4	—
21	14	M	Humerus	M	3	—
22	8	M	Femur	I	3	—
23	12	M	Femur	I	4	—
24	6	F	Humerus	I	2	Infection (see text)
25	9	M	Femur	I	3	—
26	9	M	Humerus	R	6	—

* I = immature cyst; M = mature cyst; R = recurrent cyst.

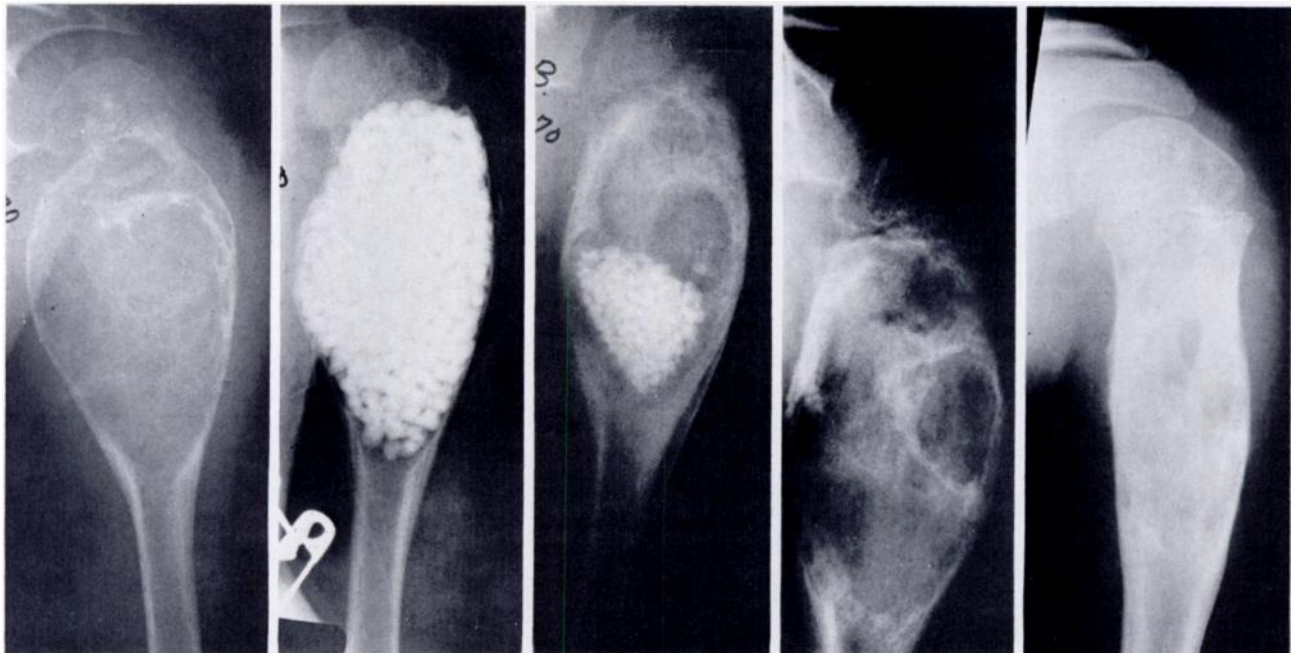


FIG. 2-A

FIG. 2-B

FIG. 2-C

FIG. 2-D

FIG. 2-E

Figs. 2-A through 2-E: Case 24.

Fig. 2-A: Roentgenogram of large cyst of the humerus of a six-year-old girl.

Fig. 2-B: Cyst packed with plaster-of-Paris pellets.

Fig. 2-C: Wound breakdown with drainage of pus and plaster.

Fig. 2-D: Resolution. Infection subsides.

Fig. 2-E: Eighteen months following operation, there is no residual infection.

cavities in bone in a wide variety of circumstances, including osteomyelitis, and we have not encountered any significant complications.

The patients included in this report, for the most part, were treated at the Shriner's Hospital for Crippled Children, Minneapolis; the Kansas University Medical Center,

Kansas City; and the Arizona Medical Center, Tucson. Additional cases contributed by colleagues have been added to extend the experience. All of the patients were treated by simple curettage of the bone, followed by packing of the cavity with plaster-of-Paris pellets (Ethicon, Inc.).

The minimum follow-up period has been one year and the maximum, twenty years (Table I). There were two procedures that were complicated by drainage and in both

of these patients the cyst recurred. These two patients required a second operation. One patient had a staphylococcal infection that was treated by débridement of the wound. The cyst went on to heal. One cyst recurred partially but did not require reoperation. Of the twenty-six patients, only two required reoperation for recurrence. This figure compares favorably with the recurrence rate of 8 per cent reported by Boseker and associates following a much more extensive operation.

References

1. AGERHOLM, J. C., and GOODFELLOW, J. W.: Simple Cysts of the Humerus Treated by Radical Excision. *J. Bone and Joint Surg.*, **47-B**: 714-717, Nov. 1965.
2. BAKER, D. M.: Benign Unicameral Bone Cyst. A Study of Forty-five Cases with Long-Term Follow Up. *Clin. Orthop.*, **71**: 140-151, 1970.
3. BENSANEL, H., and BAUM, CH.: Traitement des kystes osseux solitaires du col du femur chez l'enfant. *J. Chir.*, **107**: 61-66, 1974.
4. BOSEKER, E. H.; BICKEL, W. H.; and DAHLIN, D. C.: A Clinicopathologic Study of Simple Unicameral Bone Cysts. *Surg., Gynec. and Obstet.*, **127**: 550-560, 1968.
5. CHAKOUR, K.: Klinische Untersuchungen über die Leistungsfähigkeit des Kieler Knochenpannes. *Zeitschr. f. Orthop.*, **112**: 207-217, 1974.
6. DEDERICH, R.: Kieler Spongiosa-Granulat. Eine neue praktische Form des Heteroplastischen Knochenmaterials. *Zeitschr. f. Orthop.*, **111**: 106-108, 1973.
7. DEWET, I. S., and JANSEN, C.: Personal communication, 1975.
8. DRESMANN, H.: Ueber Knochenplombierung. *Beitr. klin. Chir.*, **9**: 804-810, 1892.
9. DU TOIT, G. T.: Personal communication, 1965.
10. GIBBONS, R. J., and EWING, J. B.: Sterilization of Plaster of Paris Bandages. *Canadian Med. Assn. J.*, **61**: 618-620, 1949.
11. GREENBERG, L.: A Bacteriological Analysis of Plaster of Paris Bandages. *Canadian Med. Assn. J.*, **60**: 4-7, 1949.
12. KREBS, H.; DAUM, R.; PFLUGFELDER, H.; and ROTH, F. J.: Die juvenile Knochenzyste. *Diagnostik, Therapie und Spätergebnisse. Beitr. klin. Chir.*, **220**: 19-34, 1973.
13. MCKAY, D. W., and NASON, S. S.: Personal communication, 1976.
14. MURRAY, E. G. D., and DENTON, G. D.: Plaster of Paris as a Source of Infection in Tetanus and Gas Gangrene. *Canadian Med. Assn. J.*, **60**: 1-4, 1949.
15. NEER, C. S., II; FRANCIS, K. C.; JOHNSTON, A. D.; and KIERNAN, H. A., JR.: Current Concepts on the Treatment of Solitary Unicameral Bone Cyst. *Clin. Orthop.*, **97**: 40-51, 1973.
16. NEER, C. S., II; FRANCIS, K. C.; MARCOVE, R. C.; TERZ, JOSEPH; and CARBONARA, P. N.: Treatment of Unicameral Bone Cyst. A Follow-up Study of One Hundred Seventy-five Cases. *J. Bone and Joint Surg.*, **48-A**: 731-745, June 1966.
17. PELTIER, L. F.: The Use of Plaster of Paris to Fill Defects in Bone. *Clin. Orthop.*, **21**: 1-31, 1961.
18. PELTIER, L. F., and LILLO, ROBERT: The Substitution of Plaster of Paris Rods for Portions of the Diaphysis of the Radius in Dogs. *Surg. Forum*, **6**: 556-558, 1956.
19. PELTIER, L. F., and ORN, DUANE: The Effect of the Addition of Plaster of Paris to Autogenous and Homogenous Bone Grafts in Dogs. *Surg. Forum*, **8**: 571-574, 1958.
20. SIEGEL, I. M.: Brisement Forcé with Controlled Collapse in Treatment of Solitary Unicameral Bone Cyst. Presentation of Two Cases. *Arch. Surg.*, **92**: 109-114, 1966.
21. SPENCE, K. F., JR.; BRIGHT, R. W.; FITZGERALD, S. P.; and SELL, K. W.: Solitary Unicameral Bone Cyst: Treatment with Freeze-Dried Crushed Cortical-Bone Allograft. A Review of One Hundred and Fifty-four Cases. *J. Bone and Joint Surg.*, **58-A**: 636-641, July 1976.
22. TARSOLY, E.: Aüsfüllung der Knochenhöhlen mit Eierschalen-Gips-Gemisch. *Acta chir. Acad. sc. Hungaricae*, **4**: 63-72, 1963.
23. WILBER, M. C., and HYATT, G. W.: Bone Cysts: Results of Surgical Treatment in Two Hundred Cases. *In Proceedings of The American Academy of Orthopaedic Surgeons. J. Bone and Joint Surg.*, **42-A**: 879, July 1960.
24. WITT, A. N.; WALCHER, K.; and ZENKER, H.: Die Resektionsbehandlung rezidivierender juveniler Knochenzysten. *Arch. f. Orthop. Unfall-Chir.*, **74**: 105-115, 1972.