

calcium sulfate

: calcium sulfate
 : 2000 12 2001 11 18 , 18
 calcuim sulfate(Osteoset :Wright Medical Co. USA)
 . 11 , 7 28.4 .
 Osteoset , 가 가 6 ,
 가 2 , Osteoset 가 10 . 8
 19 12.3 . Osteoset
 : 3 92% , 6 89%
 . Osteoset 가
 : Calcium sulfate ,
 가 가 .
 , 가
 : , , calcium sulfate

가 .
 가 가
 가 가

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* 23

가, calcium sulfate 98% Osteoset

6 calcium sulfate 가, 2

calcium sulfate , 10

calcium sulfate 가

8 19

12.3

3 , 6 , 12

2000 12 2001 11

calcium sulfate(OsteosetWright Medical Co. USA)

18 , 18

가 11 , 7

7 62 28.4

9

4 , 3

2 . 8 , 4

, 3 , , 1

가 , , (Table 1),

2.8

cm³ 29.2 cm³ 11.5 cm³ (Table 2).

- a (medial to lateral) : $(a1+a2)/2$
- b (cephalic to caudal) : $(b1+b2)/2$
- c (anteroposterior) : $(c1+c2)/2$

size of bone defect = a × b × c

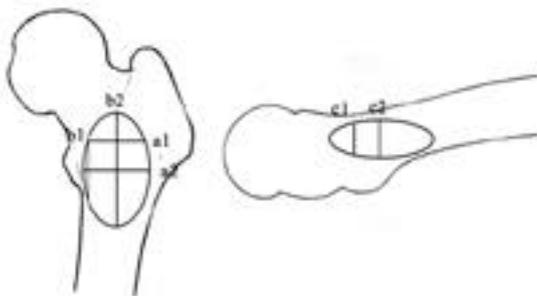


Table 1. Method of calculating the size of bone defect

calcium sulfate 98% Osteoset

6 calcium sulfate 가, 2

calcium sulfate , 10

calcium sulfate 가

8 19

12.3

3 , 6 , 12

calcium sulfate (%)

calcium sulfate 가

calcium sulfate

calcium sulfate

Kruskall-Wallis test

calcium sulfate 3

92%, 6 100%

3 82%, 6 89%

. 1

10 12 94%

Table 2. Preoperative bone defect size

Bone defect (cm ³)	Case	Average volume (cm ³)
0~5	4	3.1
5~10	3	6.9
10~15	6	11.1
15~20	2	17.5
20~25	2	21.3
25~30	1	29.2
	18 case	11.5

Table 3. Resorption and new bone formation by preoperative diagnosis

Diagnosis	Resorption(%) 3/6 month	New bone formation(%) 3/6 month
Fibrous dysplasia	91/100	81/87
Intraosseous lipoma	94/100	84/92
Simple bone cyst	92/100	81/91
Giant cell tumor	92/100	84/89
average	92/100	82/89

Table 4. Resorption and new bone formation by bone graft method

Bone graft	Resorption(%) 3/6 month	New bone formation(%) 3/6 month
Osteoset alone	91/100	84/87
mixed with autograft	94/100	80/92
mixed with allograft	91/100	78/90
average	92/100	82/89

가
가 7 가
calcium sul- calcium sulfate
fate (Fig. 1-B).
(Table 3). 3
가 calcium sulfate가
, calcium sulfate (Fig. 1-C) 7
calcium sulfate
(Fig. 1-D).
(Table 4).
2
18
1
7
(Fig. 1-A).
가 calcium sulfate
(Fig. 2-A).



Fig. 1. Simple bone cyst of proximal femur in 7-year-old boy.

- A:** Preoperative AP radiograph shows bone loss in proximal femur
- B:** Immediate postoperative radiograph taken after curettage and defect filling with calcium sulfate alone.
- C:** At postoperative 3 month, calcium sulfate was nearly resorbed.
- D:** At postoperative 7 month, bony trabeculation fills a preoperative bone defect.



Fig. 2. Fibrous dysplasia of proximal femur in 18-year-old girl.

- A:** Preoperative AP radiograph shows lytic bone lesion in proximal femur
- B:** Immediate postoperative radiograph taken after curettage and defect filling with calcium sulfate and auto-bone graft.
- C:** At postoperative 3 month, calcium sulfate was nearly resorbed.
- D:** At postoperative 6 month, bony trabeculation fills a preoperative lytic bone lesion.

(Fig. 2-B).

(Fig. 2-D).

3 calcium sulfate가
(Fig. 2-C) 6

Calcium sulfate

17)

가 가 . 가 calcium sulfate 가

calcium sulfate

15,16)

(surgical grade)

가

calcium sulfate 8)

가 가

가 calcium sulfate 가

alpha crystal

가 가 가, 가 가

9)

Calcium sulfate

12)

가

가 17) 가

1,7)

calcium sulfate

가

Calcium sulfate

가

3,4,9)

가

가

hydroxyapatite, tricalcium

phosphate, calcium sulfate

5,11)

calcium sulfate 1892 Dreesman 10)

가

. 1978 Peltier

Jones 13,14)

26 unicameral bone cyst

calcium sulfate

calcium sulfate

가

2,6,13)

hydroxyap

, Coetzee 6) 1980 calcium sulfate atite tricalcium phosphate

, calcium

sulfate 가 가

. Yamazaki

19) calcium sulfate , 3 , 6

BMP(bone morphogenic protein) 100%

8,13)

- graft substitute for benign bone lesions. *Orthopadics*, 24:162-166, 2001.
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Abstract

The Use of Calcium Sulfate as a Treatment of Benign Bone Tumor

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Introduction: The purpose of this study is to assess the efficacy of calcium sulfate as a bone graft substitute in the treatment of benign bone tumor.

Materials and Method: Between December 2000 and November 2001, 18 patients with a benign bone tumor were treated with crettage and the defects were filled with calcium sulfate (Osteoset®:Wright Medical Co. USA) as a bone graft substitute. Average age was 28.4 years and mean follow up period was 12.3 months. Calcium sulfate mixed with autograft was used in 6 cases, calcium sulfate with allograft in 2 cases, and calcium sulfate alone was used in 10 cases. The degree of absorption of calcium sulfate and new bone formation at plain radiograph was analyzed at immediate postoperative and postoperative 3 months and 6 months follow up.

Results: At 3 months postoperatively, 92% of calcium sulfate was absorbed, and at 6 months postoperatively, 89% of new bone formation was observed. There was no difference in the resorption and new bone formation between the group using bone graft and the group osteoset® alone, different preoperative diagnosis and even different locations. There was no complication.

Conclusion: Calcium sulfate(Osteoset®) is a safe and effective bone graft substitute in the treatment of benign bone tumors, especially for the children in whom autograft is not recommendable.

Key Words: Benign bone tumor, Bone defect, Calcium sulfate.

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