

# 가

, 가 \*

. . . \*

: 가

: 1996 1 1999 2

7

가

가 4 ,

가 3 , 10 (6~15),

35.6 (20~52) .

가 3 ,

가 3 , (Ilium) 1

14.7 cm<sup>2</sup>(10~23) .

6 , 1

5

3.2 .

14.3 ml(10~20) ,

Lubboc(Transphyto S.A.

Clermont Ferrand, France)

6.4 (5~10) .

Neer

: 가

가 5 ,

가

가 2 ,

: 가

, , , 가

: , 가

가

4,5,10,12)

:

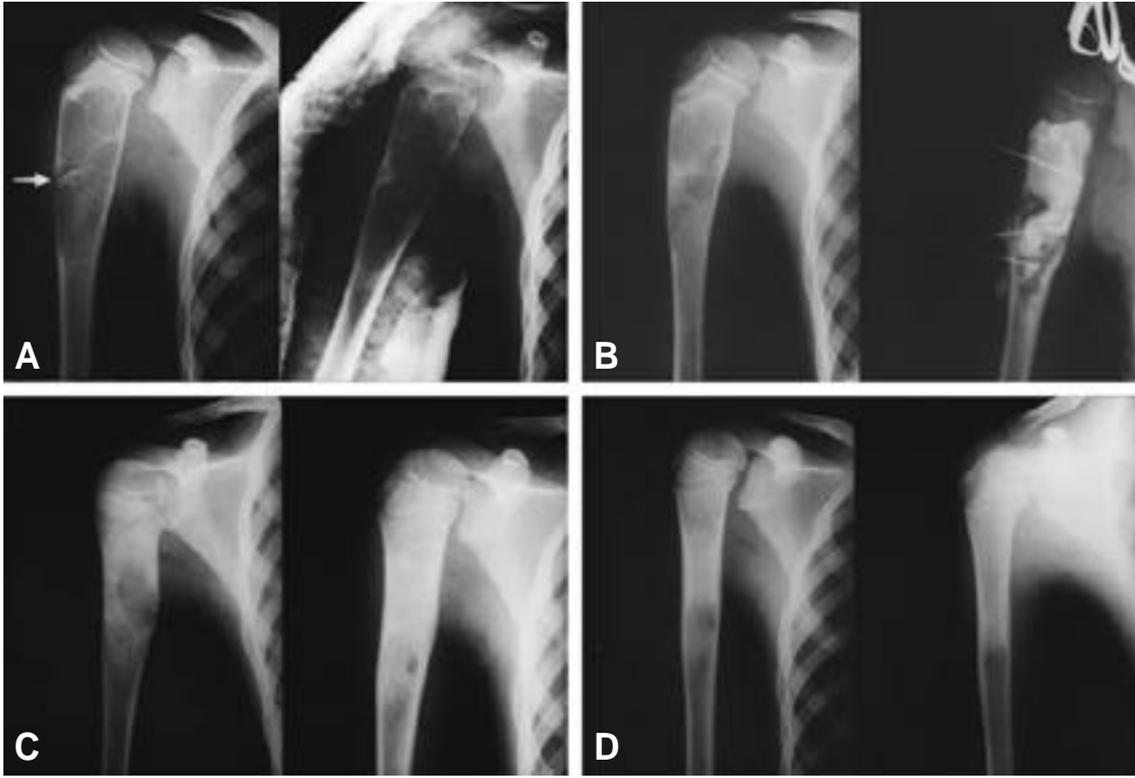
8

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\*

2000





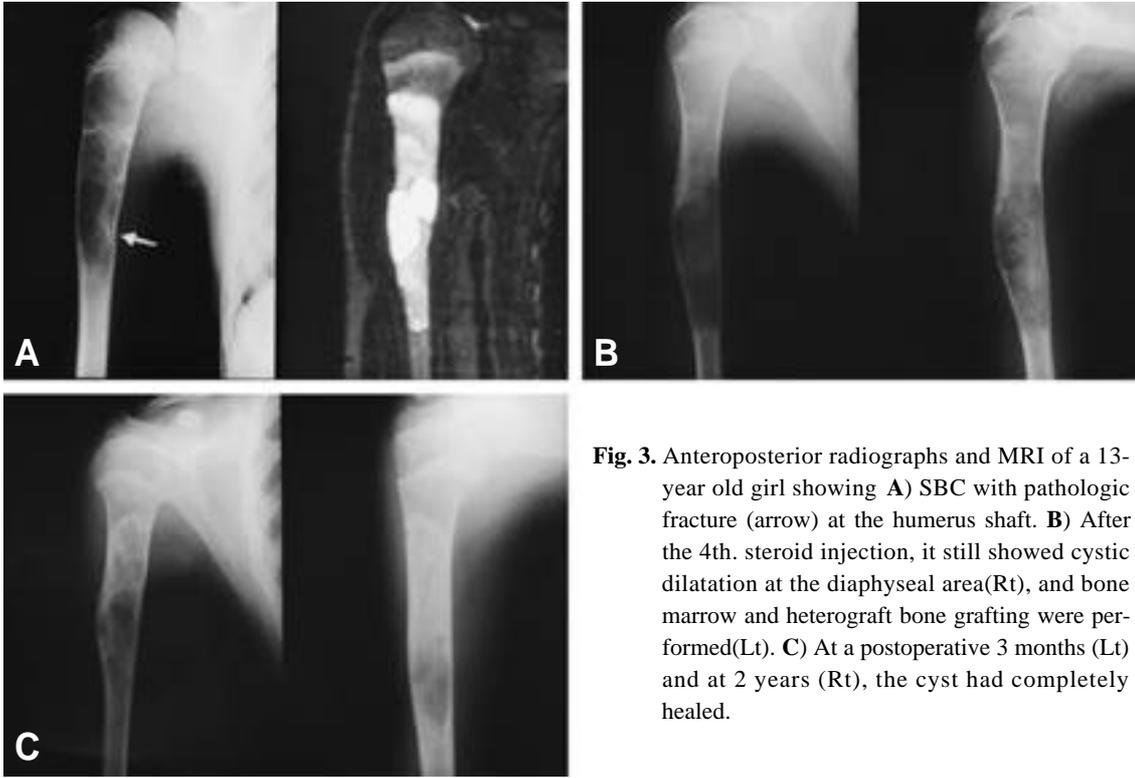
**Fig. 1.** Anteroposterior radiographs of a 7-year-old boy showing **A)** pathologic fracture (arrow) of the proximal humerus (Lt), and treatment with coaptation splint (Rt). **B)** After the 2nd. steroid injection, the cyst showed no evidence of healing (Lt) and the intraoperative cystogram (Rt). **C)** At a postoperative 3 and 6 months, there was evidence of healing and cyst obliteration. **D)** At the 12months and 3 years 4 months follow-up, the lesion had completely healed.

가 , 가 , Grade 4(Fig. 1,2,3), 가 , Grade 3, Grade 2, (catheter) 1 cm Grade 1 3,4 (window) , 1,2 . 3~6 mL 가 (Lubboc) (Fig. 2,3). 14.7 cm<sup>2</sup>(10~23) , 6 3. 14.3 ml(10~20) , Lubboc 6.4 (5~10) . Neer <sup>12)</sup> 가



**Fig. 2.** Anteroposterior radiographs and MRI showing **A)** simple bone cyst of the proximal femur in 6 year-old boy. **B)** After a 2nd steroid injection, the lesion did not improve with time follow up. **C)** At 1 day and postoperative 3 months after bone marrow and heterograft bone grafting, the cyst was observed progressing sclerosis. **D)** At 12 months and 4 years and 4 months, the lesion completely healed.

가 5 (Fig. 1,2,3),  
 가  
 가 2 ,  
 (Table 1).  
 가  
 가 5),  
 cal) 9) 가  
 가 2-5,10,12),  
 가 11),  
 (oxygen radi-  
 가 15,19)  
 가 14),  
 3,6,13,16,18),  
 19), 가  
 15), 17)  
 가  
 50~76%  
 , 10% 10%  
 가  
 5~15%  
 가 2,3,13,16)  
 가 가  
 가 15,19)  
 가



**Fig. 3.** Anteroposterior radiographs and MRI of a 13-year old girl showing **A)** SBC with pathologic fracture (arrow) at the humerus shaft. **B)** After the 4th. steroid injection, it still showed cystic dilatation at the diaphyseal area(Rt), and bone marrow and heterograft bone grafting were performed(Lt). **C)** At a postoperative 3 months (Lt) and at 2 years (Rt), the cyst had completely healed.

Lokiec <sup>10)</sup> 25 가 22 (84%) 1

Yandow <sup>19)</sup> 12 가 8 (67%) 2 (17%) , 2 (17%) 가

Scaglietti <sup>16)</sup> 1 가 24% 75% 7

Killian <sup>8)</sup> 11 (demineralized bone matrix) 2 9 (Septum)

Salama <sup>15)</sup> 5 28

28

(Osteoprogenitor cell)가  
3~6 mL

가

가

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## Percutaneous Autologous Marrow and Heterograft Bone Grafting in a Treatment for Simple Bone Cyst

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**Purpose:** To clarify the results of simple bone cyst (SBC) treatment in children by percutaneous autologous bone marrow grafting and xenografting.

**Materials and Methods:** We studied seven cases (4 males, 3 females) of SBC, which were treated by percutaneous autologous marrow and heterograft bone grafting from January 1996 to February 1999. Their mean age at surgery was 10 years (6 to 15), and the mean follow-up period was 35.6 months (20 to 52). Three cases were located in the proximal and middle humerus; three cases were in the proximal femur; and one case occurred in the ilium. Mean volume was 14.7 cm<sup>3</sup> (10 to 23). Six cases were active, and one was inactive. Five patients had a history of receiving a mean of 3.2 steroid injections. The mean quantity of bone marrow used in treatment was 14.3 ml (10 to 20), and the mean amount of Lubbo<sup>®</sup> heterograft bone (Transphyto S.A. Clermont Ferrand, France) used was 6.4 blocks (5 to 10). Results were analyzed using the modified Neer classification.

**Results:** Five cases completely healed with obliteration of the cyst cavity (Grade IV). Two cases demonstrated sclerosis around a partially visible cyst (Grade III). All treatment results were satisfactory and without intraoperative or postoperative complications.

**Conclusion:** Percutaneous autologous marrow and heterograft bone grafting is recommended as an effective treatment method for simple bone cyst. It offers ease of operative technique, a high rate of healing, a low recurrence rate, low morbidity, a low incidence of postoperative complications, and free from bone graft donor site problems.

**Key Words:** Simple Bone Cyst, Percutaneous Autologous Marrow, Heterograft

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