

stage 3

가

:	3	,
	:	1991 3 2000 2 3
	21	1 9
5.7	.	11
	, 7	
가	.	가 3
:	가	가 13 , 4 , 가 4 .
		4
3 , 1 ,		가 16 , 5 . ,
	11	1 (9.1%) , 1
(9.1%)		
	7 2 (28.6%)	, 1 (14.5%)
:		3
,		,
.		
:	,	,

5%가

2)

3%

가 65-1
 Tel: 031) 820-3066, Fax: 031) 847-3671, E-mail: wjbahk@cmc.cuk.ac.kr

3).

3 가

(, ,

) ,

3 2

Huckstep nail

, 1

(allograft-prosthesis composite)

가

가 11

가 10

31.4 (15~57)

1

9

. Marcove ^{11,12)}

5.7

. 12

3

cavity

, 9

margin 2 cm

가 Mankin 9)

가

가

가

가

가

¹³⁾

stage3

가

가 13

(Fig. 1),

4

가 4

1991 3

2000 2

4

3

21

1

가 16

Campanacci

3

5

3 (14.3%)

11

1 (9.1%)

3

18

7

2 (28.6%)

3

3

2

18

11

Marcove가

(direct pour technique)

3

7

4

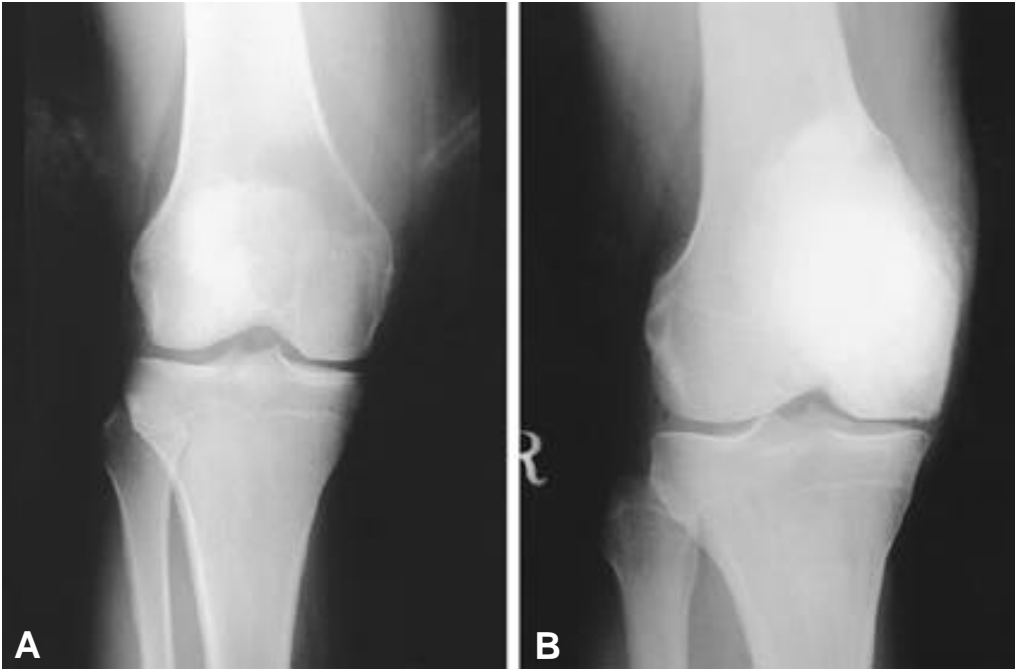


Fig. 1. 36-year old patient with giant cell tumor of distal femur. (A) Plain radiograph shows a large epi-metaphyseal osteolytic lesion extending close to joint. (B) The articular surface of the medial femoral condyle has been maintained without evidence of collapse at 3 years after primary surgery (curettage, cryosurgery and cementing).

1 8 ,
 , , .
 .
 2 1
 ,
 9 ,
 , 17 .
 .
 . 24 1 , ,
 . , ,
 .
 가 3 mm 가 40.8%, 21.9%,
 12.9% ⁸⁾, Campanacci ⁶⁾
 1 , 27%, 7%
 , 1 .

가

Mojoberg ¹³⁾

가

가

, Durr ⁵⁾

1~2 mm

9.1%

가

^{6,8,11,12,14)} 가

가

¹⁾

1969 Marcove

가 Miller¹⁰⁾

, 1970

Marcove ¹²⁾

(direct pour tech-

nique)

Mjoberg ¹³⁾

1.5 mm 2

mm,

0.5 mm

Wilkins

3

¹⁵⁾

60 °C

2 cm

, 50~60 °C

가

, 48 °C

가

PMMA 46 °C

, PMMA

가

36%

가

, Wilkins ¹⁵⁾

가

12%

. Malawer ⁸⁾

Bini ¹⁾ 11%

. Campanacci ⁴⁾

2~3%

1 cm

1 cm

7.9%

가

2.5

4

2

⁷⁾

3

³⁾

1.9%

11

1

(9.1%)

, 1

(9.1%)

2 (28.6%)
(14.5%)

Malawer 8)

가

1

3

가

REFERENCES

- 1) **Bini SA, Gill K and Johnston JO**: Giant cell tumor of bone. Curettage and cement reconstruction. *Clin Orthop*, 321:245-250, 1995.
- 2) **Boons HW, Keijser LC, Schreuder HW, Pruszczynski M, Lemmens JA and Veth RP**: Oncologic and functional results after treatment of giant cell tumors of bone. *Arch Orthop Trauma Surg*, 122:17-23, 2002.
- 3) **Campanacci M, Baldini N, Boriani S and Sudanese A**: Giant cell tumor of bone. *J Bone Joint Surg*, 69-A:106-113, 1987.
- 4) **Campanacci M, Capanna R, Fabbri N and Bettelli G**: Curettage of giant cell tumor of bone: reconstruction with subchondral grafts and cement. *Chir Organ Mov*, 75:212-213, 1990.
- 5) **Durr HR, Maier M, Jansson V, Baur A and Refior HJ**: Phenol as an adjuvant for local control in the treatment of giant cell tumour of the bone. *Eur J Surg Oncol*, 25:610-618, 1999.
- 6) **Gitelis S, Mallin BA, Piasecki P et al.**: Intralesional excision compared with en bloc resection for giant-cell tumors of bone. *J Bone Joint Surg*, 75-A:1648-1655, 1993.
- 7) **Goldenberg R, Campbell C and Bonfiglio M**: Giant cell tumor. An analysis of 218 cases. *J Bone Surg*, 52-A:619-664, 1970.
- 8) **Malawer MM, Bickels J, Meller I, Buch RG, Henshaw RM and Kollender Y**: Cryosurgery. In the treatment of the giant cell tumor: a long term follow-up study. *Clin Orthop*, 359:176-188, 1999.
- 9) **Mankin HJ, Doppelt SH, Sullivan TR and Tomford WW**: Osteoarticular and intercalary allograft transplantation in the management of malignant tumor of bone. *Cancer*, 50:613-630, 1982.
- 10) **Marcove RC and Miller TR**: Treatment of primary and metastatic bone tumors by cryosurgery. *JAMA*, 207:1890-1894, 1973.
- 11) **Marcove RC, Sheth DS, Brien EW, Huvos AG and Healey JH**: Conservative surgery for giant cell tumors of the sacrum. The role of cryosurgery as a supplement to curettage and partial excision. *Cancer*, 74:1253-1260, 1994.
- 12) **Marcove RC, Weis LD, Vaghaiwalla MR, Pearson R and Huvos AG**: Cryosurgery in the treatment of giant cell tumors of bone: a report of 52 consecutive cases. *Cancer*, 41:957-969, 1978.
- 13) **Mjoberg B, Pettersson H, Rosenqvist R and Rydholm A**: Bone cement, thermal injury and the radiolucent zone. *Acta Orthop Scand*, 55:597-600, 1984.
- 14) **O'Donnell RJ, Springfield DS, Motwani HK, Ready JE, Gebhardt MC and Mankin HJ**: Recurrence of giant cell tumors of the long-bones after curettage and packing with cement. *J Bone Joint Surg*, 76-A:1827-1833, 1994.
- 15) **Wilkins RM, Okada Y, Sim FH, Chao EYS, Gorgki J**: Methylmethacrylate replacement of subchondral bone: A biomechanical, biochemical, and morphological analysis. In Enneking WF ed. Limb-sparing surgery in musculoskeletal oncology. *New York Churchill Livingstone*, 479-485, 1987.

Treatment of stage 3 giant cell tumor around the knee

Won-Jong Bank, M.D., Seung-Koo Rhee, M.D., Yong-Koo Kang, M.D.
Oh-Soo Kwon, M.D., Yang-Guk Chung, M.D.

Musculoskeletal Oncology Group, The Catholic University of Korea

Purpose: To analyze the clinical outcome and radiological features after surgical treatment of stage III giant cell tumor around the knee.

Materials and Methods: 21 patients with stage III giant cell tumor around the knee joint, who were operated at our institutes between March 1991 and February 2000, were selected for this study. The average follow-up was 5.7 years (range, 1~9 years). After thorough curettage using high speed burr, cryosurgery and cementing with polymethylmethacrylate (PMMA) were performed in 11 patients. 7 patients were treated with PMMA cementing (4 patients) or bone grafting (3 patients) after curettage without cryosurgery. Reconstruction with prosthesis composite allograft and knee fusion with Huckstep nail were performed in 3 patients with huge defect and joint perforation.

Results: Local recurrence developed in 1 out of 11 patients who was treated with curettage and cementing with cryosurgery (9.1%) and 3 out of 7 patients who underwent curettage and cementing without cryosurgery (28.6%). Joint space narrowing more than 3mm was noted in 1 patient (9.1%), who treated with cryosurgery and another patient (14.5%) who treated without cryosurgery. There was no local recurrence in case of wide resection and reconstruction.

Conclusion: Thorough curettage and PMMA cementing with cryosurgery as an adjuvant is thought to be effective modalities in the treatment of stage 3 giant cell tumors around the knee. Wide resection and reconstruction can be reserved mainly for the cases of stage 3 giant cell tumor with significant cortical destruction and marked joint destruction, and the cases of local recurrence with poor bone stock.

Key Words: Knee, Giant cell tumor, Knee, Curettage, Cryosurgery, Cementing

Address reprint requests to

Won-Jong Bank, M.D.

Department of Orthopedic Surgery, The Catholic University of Korea, Musculoskeletal Oncology Group
Geumo-dong, Uijeongbu-si, Gyeonggi-do 480-717, Korea

TEL : 82-31-820-3066, FAX : 82-31-847-3671, E-mail : wjbahk@cmc.cuk.ac.kr