

가 7), , 6 MSTTS 가 63.3% , 가 70%, 가 50% (Table 2). 1 가 ,

1.(Fig. 1-3)

71

가

가

가

MSTTS 가 7 6 50%

2. (Fig. 4-10)

2000 5 2003 5 63 가

6 , 5 (

) 60.8 (48~71), 3:2

, () 2 23.2 (7~57)

2 , , ,

1

1 , 가 2

가

4 ,

가

2

(Table 1). 6

Musculoskeletal

Tumor Society(MSTS)

가 (1993

)³⁾

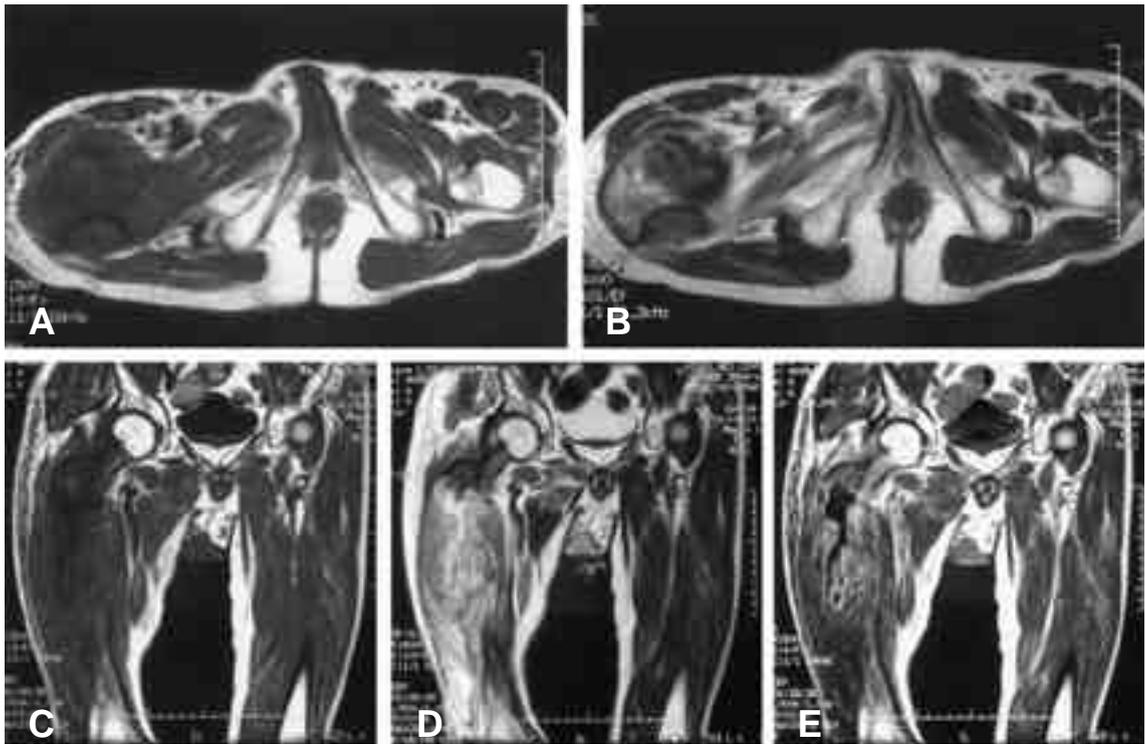


Fig. 1. 71 year-old-male. Lung cancer. Initial X-ray Osteolytic lesions are shown on subtrochanteric area of right femur with pathologic fracture.

Table 1. Characteristics of subjects

No	Age	Sex	Origin	Other Metastasis	Management	survival duration after surgery (month)
1	63	M	kidney	Humerus Both	W/E* ∅ IORBG [†] ∅ Bipolar hemiarthroplasty	57
2 [‡]					W/E ∅ IORBG ∅ Bipolar hemiarthroplasty	36
3	62	F	Multiple Myeloma	L5	W/E ∅ IORBG ∅ Bipolar hemiarthroplasty	21
4	48	F	Stomach		W/E ∅ IORBG ∅ Bipolar hemiarthroplasty	10
5	71	M	Lung		W/E ∅ pastuerization ∅ THA [§]	7
6	60	M	Lung	T9, L3	W/E ∅ pastuerization ∅ THA	8

*Wide excision

[†]Intraoperative radiated bone graft[‡]The identical patient as No 1.[§]Total hip arthroplasty**Fig. 2.** 71 year-old-male. Lung cancer. Initial thigh MRI

6 × 7 × 12 cm mass (low signal on T1 weighted image, Hi signal on T2 weighted image, high signal on post-contrast T1 weighted image) is shown on right proximal femur.

가

21

36 (57)
 6 MSTs 가
 80%, 70%

3. (Fig. 11-15)

60

3

가

9



Fig. 4. 63 year-old-male. Renal cell cancer. Initial X-ray Osteolytic lesions are shown on right femoral neck with pathologic fracture(Open reduction and internal fixation state with compressive hip screw in other hospital)



Fig. 3. 71 year-old-male. Lung cancer, Postoperative X-ray Recycling autograft-prosthesis composite with pasteurization of right proximal femur was done

Table 2. Musculoskeletal Tumor Society(1993) scores

No	Pain	Function	Emotional accept	Support	Walking ability	Gait	Sum	Score (%)
1	4	4	5	4	4	3	24	80
2	4	3	5	3	3	3	21	70
3	3	3	4	2	4	4	20	67
4	4	3	4	3	3	2	19	63
Subtotal mean score (W/E c IORBG c Bipolar hemiarthroplasty)							21	70
5	2	3	3	2	3	2	15	50
6	3	3	2	1	3	3	15	50
Subtotal mean score (W/E c pastuerization c THA)							15	50
Total mean score							19	63.3

가

3

6 MSTS 가 50% 가

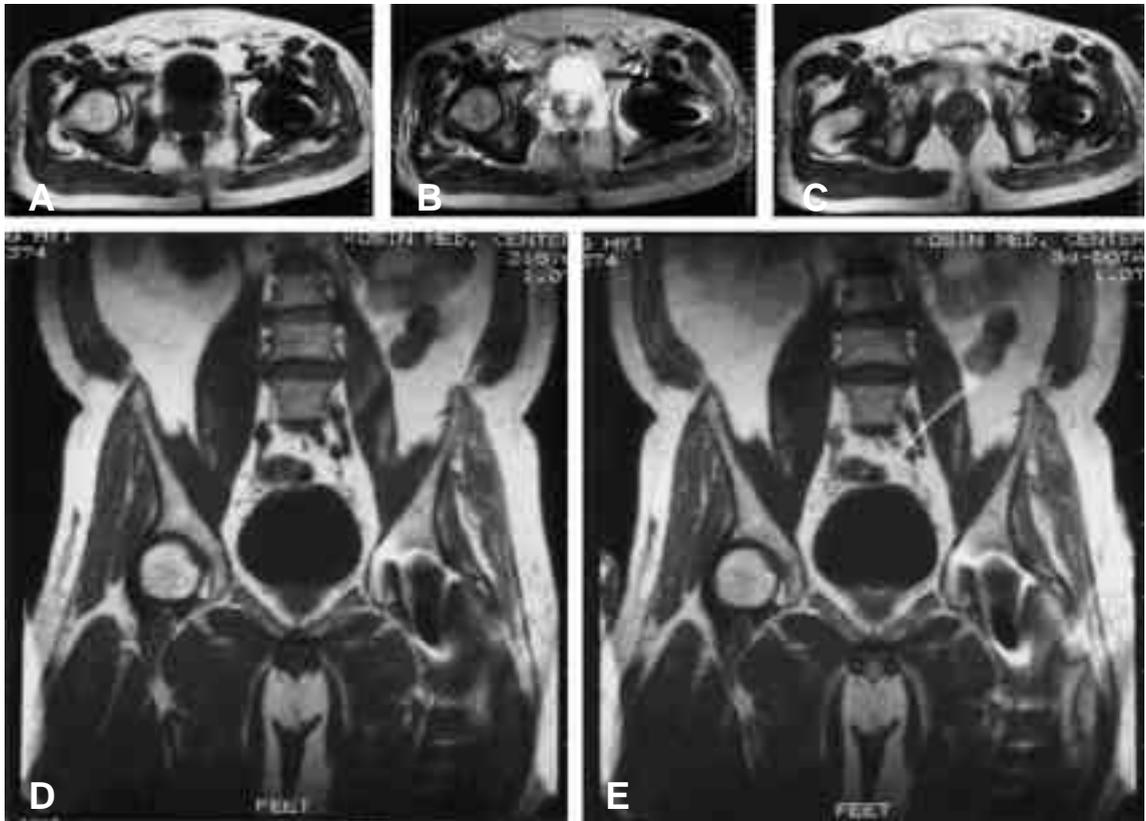


Fig. 5. 63 year-old-male. Renal cell cancer. Initial MRI
Indefinite mass due to interference phenomenon of metal is shown on left proximal femur.

Table 3. Comparison with other paper

Study	case	Hip Reconstruction	MSTS* score(93 %)
Our study	6	THA [†] 2 with Recycling Autograft Bipolar 4 with Recycling Autograft	63.3%
Ogilvie et al ¹¹⁾	34	THA 10, Bipolar 23	67.7%
Zehr et al ¹³⁾	10	THA 6, Bipolar 4	79.9%
McGoveran et al ¹⁰⁾	13	13 THA with Allograft	58.3%

* Musculoskeletal Tumor Society

[†]Total hip arthroplasty



Fig. 6. 63 year-old-male. Renal cell cancer. Postoperative X-ray
Recycling autograft-prosthesis composite with irradiation of left proximal femur was done



Fig. 7. 63 year-old-male. Renal cell cancer. Follow-up
X-ray after 1st surgery



Fig. 8. 63 year-old-male. Renal cell cancer. Initial X-ray
before 2nd surgery
Osteolytic lesions are shown on subtrochanteric
area of right femur.

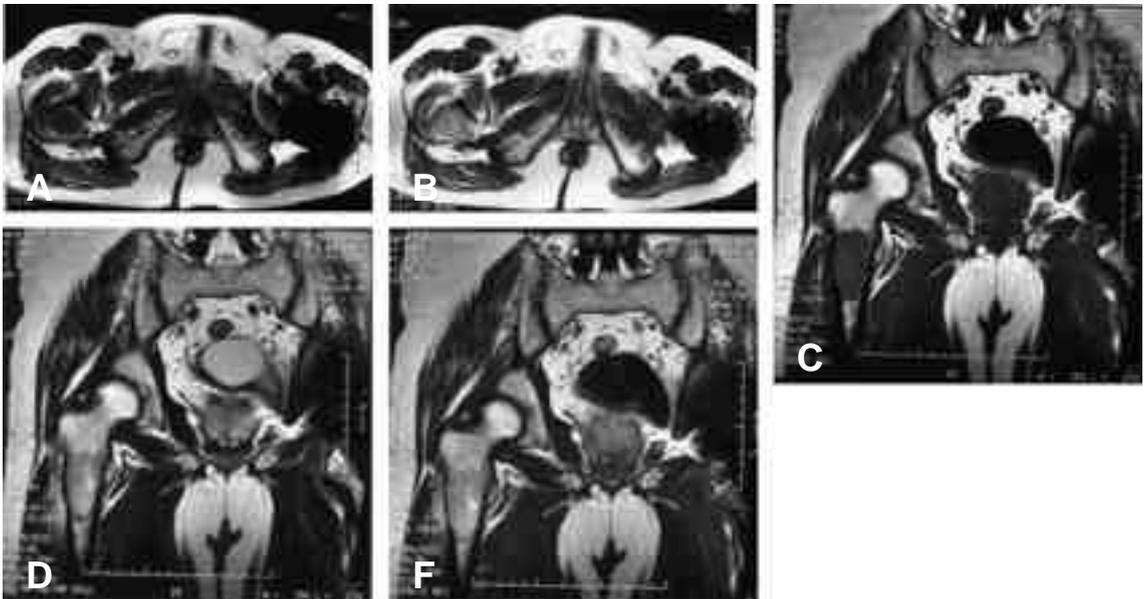


Fig. 9. 63 year-old-male. Renal cell cancer. Initial MRI before 2nd surgery
 3 × 3 × 5 cm mass(low signal on T1 weighted image, Hi signal on T2 weighted image, high signal on postcontrast T1 weighted image) is shown on right proximal femur.



Fig. 10. 63 year-old-male. Renal cell cancer. Postoperative X-ray after 2nd surgery
 Recycling autograft-prosthesis composite with irradiation of right proximal femur was done





Fig. 11. 60 year-old-male. Lung cancer. Initial X-ray
Osteolytic lesions are shown on neck and intertrochanteric area of left femur with pathologic fracture of femoral neck.

가 , 5
16%, 14%, 5%, 78%,
38%, 58%, 3%, 9%,
79%, 53%, 26%,
94%, 54%, 80%

Harrington
, 28 ,
20 . ,

가 .



Fig. 12. 60 year-old-male. Lung cancer. Initial MRI
3 × 4 × 6 cm mass(low signal on T1 weighted image, Hi signal on T2 weighted image, intermediate signal on postcontrast T1 weighted image) is shown on left proximal femur.



Fig. 13. 60 year-old-male. Lung cancer. Postoperative X-ray
 Recycling autograft-prosthesis composite with pastuerization of left proximal femur was done



Fig. 14. 60 year-old-male. Lung cancer. Follow-up X-ray(Hip dislocation state)
 Left hip dislocation was occurred on 3 months after surgery



Fig. 15. 60 year-old-male. Lung cancer. Postoperative X-ray(Open reduction state)

가 가
 , 가
 .
 , S-Rom
 .
 MSTs 가 63.3%
 10,11,13)
 (Table 3)
 . 2
 가
 7~8 , 가
 .
 6
 , , , ,
 가

REFERENCES

- 1) **Berrey Jr BH, Lord CF, Gebhardt MC and Mankin HJ:** Fractures of allograft: Frequency, treatment and end-result. *J Bone Joint Surg*, 72A:825-833, 1990
- 2) **Dobbs HS, Scales JT, Wilson JN et al:** Endoprosthetic replacement of the proximal femur and acetabulum. *J Bone Joint Surg*, 63B:219-224, 1981
- 3) **Enneking WF, Dunham W, Gebhardt MC,**

- Malawar M and Pritchard DJ:** A system for the functional evaluation of reconstructive procedures after surgical treatment of tumors of the musculoskeletal system. *Clin Orthop*, 286:241-246, 1993
- 4) **Harrington KD:** New trends in the management of lower extremity metastases. *Clin Orthop*, 169:53-61, 1982
- 5) **Horowitz SM et al:** Prosthetic and extremity survivorship after limb salvage for sarcoma, How long do the reconstructions last? *Clin Orthop* 293:280-286, 1993
- 6) **Jofe MH, Gebhardt MC, Tomford WW and Mankin HJ:** Reconstruction for defects of the proximal part of the femur using allograft arthroplasty. *J Bone Joint Surg*, 70A:507-516, 1988
- 7) **Kim KJ, Kang HS, Kim YI and Shin BJ:** Clinical analysis of metastatic tumors of bone. *J of Korean Bone & Joint Tumor*,7(4):133-138,2001
- 8) **Lord CF, Gebhardt MC, Tomford WW and Mankin HJ:** Infection in bone allografts : Incidence, nature and treatment. *J Bone Joint Surg*, 70A:369-376, 1988
- 9) **Mankin HJ:** The use of frozen cadaveric allograft in the management of patients with bone tumors of the extremities. *Orthop Clin North Am* 18:275-289, 1987
- 10) **Mcgoveran BM, Davis AM, Gross AE and Bell RS:** Evaluation of the allograft-prosthesis composite technique for proximal femoral reconstruction after resection of a primary bone tumor. *Can J Surg*, 42:37-45, 1999
- 11) **Ogilvie CM, Wunder JS, Ferguson PC, Griffin AM and Bell RS:** Functional Outcome of endoprosthetic proximal femoral replacement. *Clin Orthop*, 426:44-48, 2004
- 12) **Vincent T, Devita Jr:** Principles & practice of oncology, 4th ed, Rosenberg, Steven A, 160-161, 1993
- 13) **Zher HJ, Taminiau AH, Schimmel JW and van Horn Jr:** Allograft-prosthesis composite versus megaprosthesis in proximal femoral reconstruction. *Clin Orthop* 322:207-223, 1996

Abstract**Surgical Treatment of Metastatic Tumor in Proximal Femur with Recycling Autograft Prosthetic Composite after Wide Excision**

**Jae Do Kim, M.D., Pil Jae Park, M.D., Young Ho Kwon, M.D.,
Jae Ho Jang, M.D., Young Gu Lee, M.D.**

Department of Orthopaedic Surgery, Kosin University Gospel Hospital, Busan, Korea

Purpose: Due to local recurrence of tumor, metal failure usually develops in patients who underwent internal fixation or hip joint arthroplasty after curettage in the case of metastatic tumor of proximal femur. The aim of this study is to find out the appropriateness of reconstruction using recycling autograft after wide excision in the case of metastatic bone tumor by performing recycling autograft and hip joint arthroplasty after wide excision, and through presence or absence of local recurrence, functions of lower limbs and occurrence of complications.

Materials and Methods: Five patients, in 6 cases, who had undergone reconstruction using recycling autograft prosthetic composite after wide excision in the metastatic tumor from May 2000 to May 2003 were included in this study. The average age of the patients was 60.8 years of age with male to female ratio of 3:2. Average duration of lives following surgery was 23.3 month (7-57 months). Primary lesion included 2 cases of lung cancer, and 1 each of stomach cancer, renal cancer and multiple myeloma. After wide excision, the hip joint was reconstructed with recycling autograft prosthetic composite ; 4 cases of extracorporeal irradiation and 2 cases of pasteurization. Musculoskeletal Tumor Society (MSTS) score(1993) for 6-month period after surgery, as well as presence of complication and local recurrence during the rest of their lives, were studied.

Results: Average Musculoskeletal Tumor Society (MSTS) score over the 6-month period after surgery was 63.3% and 1 case of dislocation of hip joint, as a complication following surgery, was discovered. Local recurrence during the lives of the patients was not observed.

Conclusion: In the case of metastatic tumor of proximal femur, in which the life span following surgery is expected to be more than 6 months, undergoing reconstruction using recycling autograft after wide excision, in comparison to internal fixation or hip joint arthroplasty after curettage, is deemed to have better results in prevention of local recurrence, and preservation of the functions of all limbs during the life span of the patient.

Key Words: Proximal femur, Metastatic tumor, Wide excision, Recycling autograft prosthetic composite

Address reprint requests to

Jae Do Kim, M.D.

Department of Orthopaedic Surgery, Kosin University Gospel Hospital

Amnam-dong Seo-gu Busan, Korea 602-702

TEL: 82-51-990-6467, Fax: 82-51-243-0181, E-mail: jdkim@ns.kosinmed.or.kr