

가 3

:				가
:		3		가
:	1 ~ 20		3	
		6		132 2
	가			(ABG)
			2 ~ 56	3
			65	30
가				(ABG)
			HDMTX, ADR, CDDP	
3 ~ 46		65	30	가
			(Protek)	
		/		
:			1 7	
	Ennecking		가 53%	가
1	1 6			
			2 3 6	
		가	60%	가 3 7

: 28

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가 63% 가 .
 : 가 3
 : , , , , ,
 가

132 2 1 2
 가 65 30 .

1
 20 3
 , 가 , 가
 , Girdlestone , ,
 2,11,27) 가 2 가 6 132
 (ABG)
 3,5,8,10,13,14,18,25) , 가 (Fig. 1).
 4)
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 , 56 3
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 (ABG)
 15).
 3 CDDP HDMTX, ADR,
 (Fig. 2).
 가



Fig. 1. (A) This is preoperative simple X-ray of the case 1 after curettage and cementing. (B) This is MRI of the case 1. (C) This is final simple X-ray of the case 1 after 7 years from the operation.



Fig. 2. (A) This is preoperative simple X-ray of the case 2. (B) This is preoperative MRI of the case 2. (C) This is final simple X-ray of the case 2 after 3 years and 6 months from the operation.

Table 1. Patient's data

Patient No.	Age (years)	Gender	Site	Stage	Diagnosis	Margin	Resection type	F/U (months)	Outcome
1.hoh	27.9	F	acetabulum+ ilium	Ib	W/D OSA	wide	II+H	84	CDF
2.kjj	59.4	F	acetabulum+ ilium	I Ib	Fibroblastic OSA	wide	II+H	42	CDF
3.kjs	46.7	F	acetabulum + pubis	I Ib	Chondrosarcoma	wide	II+H	7	CDF

Table 2. Reconstruction Types and Functional Evaluation According to Enneking et al.⁹⁾

Patient No.	Reconstruction	Pain	Function	Emotional Acceptance	Supports	Waking Ability	Gait	Rating (percent)
1	autoclaved	5	2	2	3	2	2	53
2	extracorporeal low heat-treatment	5	2	3	3	1	2	60
3	extracorporeal low heat-treatment	5	2	4	2	3	3	63

3
46
65 30
가 (Protek)
2/3 (Fig. 3).
Type Type
Type , Type Type +
가 가 가
1.
7 1 24). Langlais 10
3 6 2 3
3 7 가 63% , 6 , 2 , 2
가 . 60 , ,
2.
Enneking 가 9). 1 1 Nagoya 15). 가
53% 가 6 4



Fig. 3. (A) This is preoperative simple X-ray of the case 3. (B) This is preoperative MRI of the case 3. (C) This is post-operative simple X-ray of the case 3 after 7 months from operation.

		¹⁹⁾	Aboulafia	17	
Ozaki	12				가가 가
		39%	9	7	, 2
		²²⁾ Schwameis			
19					
		²⁴⁾	Abudu		¹⁾
		70%	Ozaki	22	
		²⁾			2
(23%)	(26%)		8		
Campanacci	Wirbel			²¹⁾	
^{7,27)}			Harrington	10	2 가 가

Loty 15%, Mnaymneh 25%
 Joyce Makley 50% 가
 13,17)
 가
 Chen 14 3
 300 Gy
 가
 80%
 8). Araki
 50 Gy
 20% 15% 3)
 Suk 12
 83.3% 5 76.7%
 56.8%
 91.7%, 4.6
 5, 23, 25)
 70 1
 가 18, 20, 26)
 가
 45 11
 65
 60 30
 5, 6, 12, 16)
 가 4)

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Recycling Bone Autotransplantation with Extracorporeal Heat-Treatment for Malignant Bone Tumors of Pelvis

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Study Design: A retrospective clinical and radiographic review.

Objectives: The purpose of this study was to suggest recycling bone autotransplantation with extracorporeal heat-treatment as one of favorable reconstruction method for malignant bone tumors of pelvis through 3 cases.

Summary of Literature Review: There are many biologic and nonbiologic reconstruction method in pelvic reconstruction.

Cases: Case 1- A 20-year-old women had chief complaint of right hip and thigh pain started 3 months ago and done curettage and bone cementing at right ilium at other hospital. She had impression of malignant bone tumor and undergone postoperative radiation therapy for 6 cycles. After that she was referred to our hospital and undergone wide excision of right ilium and recycling bone autotransplantation with extracorporeal heat-treatment at 132 degree celsius for 2 minutes internal fixation with pelvic reconstruction plate and total hip replacement arthroplasty (ABG®). There was no evidence of distant metastasis and revealed well-differentiated osteosarcoma on postoperative pathology. Neither adjuvant nor neoadjuvant chemotherapy were done. Case 2- A 56-year-old women who suffered right thigh pain for 3 months was detected radiologic abnormality at right pelvis. After incisional biopsy, osteosarcoma was diagnosed. We had undergone wide excision of right ilium and recycling bone autotransplantation with extracorporeal low heat-treatment at 65 degree celsius for 30minutes internal fixation with pelvic reconstruction plate and total hip replacement arthroplasty (ABG®). There was no evidence of distant metastasis and revealed high-grade osteosarcoma which was fibroblastic type on postoperative pathology. Adjuvant chemotherapy (HDMTX, ADR, CDDP) was done immediate after wound healing was completed. Case 3- A 46-year-old women was incidently found mass at left ilium which was suspected chondrosarcoma. We had undergone wide excision of left ilium and recycling bone autotransplantation with extracorporeal low heat-treatment at 65 degree celsius for 30minutes internal fixation with pelvic reconstruction plate and total hip replacement arthroplasty (Protek®). There was no evidence of distant metastasis and revealed chondrosarcoma which was graded / on postoperative pathology.

Results: Oncologic and functional outcome at final follow-up were for case 1, final follow-up time was 7 years, is no evidence of disease and functional score is 53% according to Enneking et al. During follow-up, evidence of radiologic union was at about 1 and 6 months after operation. The case had breakage of pelvic reconstruction plate and some resorption of autotransplated bone, but no symptom present. For case 2, final follow-up was 3 years and 6 months, is no evidence of disease and functional score is 60%. For case 3, final follow-up was 7 months, no evidence of disease and functional score is 63% which is improving state.

Discussion: 3 cases which were undergone recycling bone autotransplantation with extracorporeal heat-treatment and total hip replacement arthroplasty had relatively successful oncologic

and functional outcome. Taking account that difficulty in using allograft in Korea this method is thought to be one of the useful way to reconstruct pelvis after resection of primary malignant bone tumor of the pelvis.

Key Words: Pelvis, Osteosarcoma, Chondrosarcoma, Total hip replacement arthroplasty, Recycling bone autotransplantation with extracorporeal heat-treatment

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