

• •

가  
(variability)

I.  
.  
.  
.  
V.

1983 Fuji (Tokyo,  
Japan) (computed  
Radiography; CR)1,2,7,8,11,12,13,14)

I.

Broadbent5)

X  
plate) X  
laser imager  
(imaging

가

( 1).

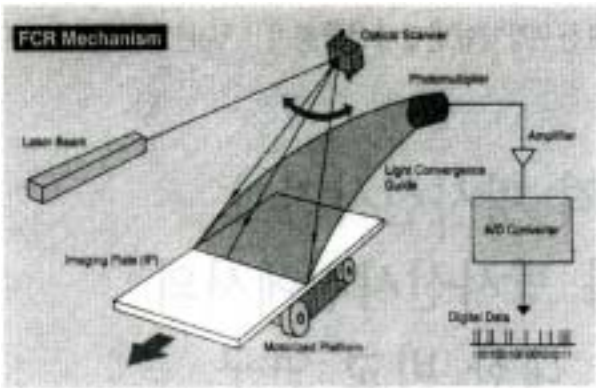
Bjork4), Baumrind Frantz3),  
Richardson9,10) gravely Benzies6)

가 ,  
가 , X

(reproducibility)

가  
(variation)

( )



1. FCR(Fuji Computed Radiography)

X 가 (imaging plate) laser

beam scanning 가

가

(variation)

가.

28

Cranex 3+

Ceph(Soredex, Orion Co., Helsinki, Finland)

75~77kVp, 10mA,  
1.0~1.2 , 10X12  
Fuji New Rx (Fuji Photo  
Film Co., Ltd., Tokyo, Japan) Kyokko HS  
(Kasei Optonix, Ltd., Tokyo, Japan)

73kVp, 10mA, 0.8~1.0 ,  
10X12 Fuji Imaging Plate ST -  
V(Fuji Photo Film Co., Ltd., Tokyo, Japan)

가  
Fuji  
FPM 3500(Fuji Photo Film Co., Ltd., Tokyo,  
Japan) 80

(Imaging Plate) laser  
FCR AC-3(Fuji Photo Film Co., Ltd.,  
Tokyo, Japan)  
( 1) HI-  
C654(Fuji Photo Film Co., Ltd., Tokyo, Japan)

Fuji medical laser imager  
FL-IM D(Fuji Photo Film Co., Ltd., Tokyo,  
Japan)  
28

4

24 ( 2).

x 0, y 0 x( )  
y( ) SAS 6.04

(mean coefficient of variation)  
paired t-test

x , y



그림 2. 계측점

1. S	Sella	2	N	Nasion
3. Or	Orbitale	4	P	Porion
5. Ar	Articulare	6	ANS	Anterior nasal spine
7. PNS	Posterior nasal spine	8	A	Point A
9. B	Point B	10	Pog	Pogonion
11. Me	Menton	12	UIE	Upper incisor edge
13. LIE	Lower incisor edge	14	UIA	Upper incisor apex
15. LIA	Lower incisor apex	16	L6C	Lower first molar의 mesiobuccal cusp tip
17. G	Glabella	18	Cm	Columella point
19. Sn	Subnasale	20	StrnS	Stomion superius
21. StrnI	Stomion inferius	22	Pog'	Soft tissue pogonion
23. Me'	Soft tissue menton	24	C	Cervical point

표 1. x 2

	In FCR Ceph. Mean coefficient of variation	In Conventional Ceph. Mean coefficient of variation	t-test
Sella	0.37	0.36	
Nasion	0.36	0.32	
Orbitale	0.72	0.79	
Porion	0.73	0.71	
Articulare	0.46	0.46	
ANS	0.78	0.65	*
PNS	0.56	0.76	*
A point	0.38	0.44	
B point	0.35	0.33	
Pogonion	0.31	0.27	
Menton	0.48	0.39	
UIE	0.31	0.24	
LIE	0.36	0.28	
UIA	0.63	0.54	
LIA	0.47	0.60	
L6C	0.47	0.55	
Glabella	0.26	0.20	**
Columella	0.56	0.65	
Subnasale	0.30	0.27	
StrnS	0.49	0.42	
StrnI	0.50	0.42	
Pog'	0.44	0.58	
Me'	0.55	0.57	
Cervical point	0.80	1.51	**

P<0.05 \*    P<0.01 \*\*

표 2. y 값

	In FCR Ceph. Mean coefficient of variation	In Conventional Ceph. Mean coefficient of variation	t-test
Sella	0.50	0.30	**
Nasion	0.70	0.91	*
Orbitale	0.65	1.13	**
Porion	0.70	0.61	
Articulare	0.58	0.61	
ANS	0.86	1.00	
PNS	0.59	0.60	
A point	0.79	1.16	**
B point	1.22	2.56	**
Pogonion	1.28	2.82	**
Menton	0.68	1.19	**
UIE	0.46	0.49	
LIE	0.43	0.66	**
UIA	0.82	1.43	**
LIA	1.27	2.54	**
L6C	0.52	0.97	**
Glabella	0.96	1.32	**
Columella	0.78	1.02	*
Subnasale	0.48	0.49	
StrmS	0.49	0.48	
Strml	0.50	0.55	
Pog'	2.64	7.89	**
Me'	0.84	2.07	**
Cervical point	1.51	9.06	**

p<0.05 \* , p<0.01 \*\*

24 (mean coefficient of variation) paired t-test 가  
 x y 1, 2 (laser image reader)  
 (Imaging Plate) X / X

CRT

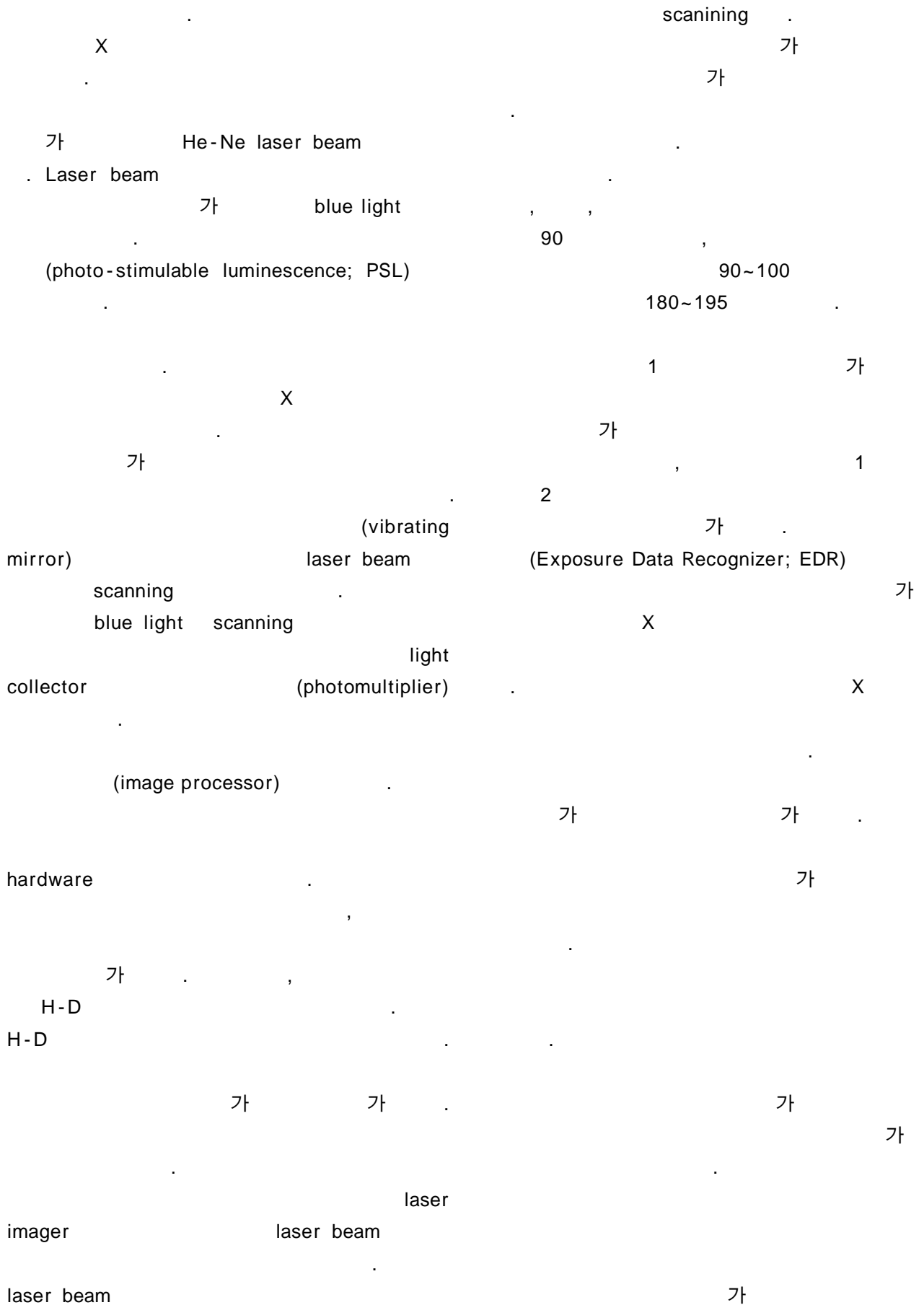
laser imager

1983 Fuji (Tokyo, Japan) (computed Radiography; CR)<sup>1,2,7,8,11,12,13,14)</sup>

polyester base europium-activated barium fluorohalide compounds

1mm , 가

X



Bjork4)  
 (reproducibility) 가  
 Baumrind Frantz3)  
 (variability) ,  
 Richardson9) 가  
 Gravely , 24  
 Benzies6) 4  
 가 ANS Glabella  
 가 PNS Cervical point  
 (reliability) (mean 24 16  
 coefficient of variation) Sella 15  
 (reliability)가  
 (repeated  
 identification)  
 (variability)  
 Glabella, UIE, Sn, Pog, LIE, B, Na,  
 Sella LIA, UIA, Orbitale, Porion,  
 PNS, ANS, Cm, Cervical point  
 , UIE, Sella, Sn, StmS, Stml,  
 LIA, Articulare , UIA, Glabella, B,  
 LIA, Pog , Pog', Cervical point  
 . Sella, Orbitale, Porion, PNS, StmS  
 Stml  
 가 V.  
 가  
 UIE LIE edge가 sharp , Pog,  
 Cervical point edge가 gradual curve 28  
 edge contrast , 28  
 4 가 24  
 1.

(mean coefficient of variation)

가  
2.

24                      4  
가  
16

20(4+16)                      17

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14.                      :                      가?,                      34: 177-184, 1996

- ABSTRACT -

**A COMPARATIVE STUDY OF COMPUTED RADIOGRAPHIC CEPHALOMETRY AND  
CONVENTIONAL CEPHALOMETRY IN RELIABILITY OF HEAD FILM  
MEASUREMENTS (LANDMARKS IDENTIFICATION)**

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The purpose of this study was to compare & to find out the variability of head film measurements(landmarks identification) between Fuji computed radiographic cephalometry and conventional cephalometry.

28 Korean adults were selected. Lateral cephalometric FCR film and conventional cephalometric film of each subject was taken. Four investigators identified 24 cephalometric landmarks on lateral cephalometric FCR film and conventional cephalometric film. The comparable measurements between lateral cephalometric FCR film and conventional cephalometric film were statistically analysed.

The results were as follows :

1. In FCR film & conventional film, coefficient of variation (C.V.) of 24 landmarks was taken horizontally & vertically. There is no significant difference of rank order of landmarks in C.V. between two films
2. In comparison of significant differences of landmarks variability between FCR film & conventional film, horizontal value of coefficient of variation showed significant differences in four landmarks among twenty-four landmarks, but vertical value of coefficient of variation showed significant differences in sixteen landmarks among twenty-four landmarks.

FCR film showed significantly less variability than conventional film in 17 subjects among 20(4+16) subjects that showed significant difference.