

# Human Papillomavirus

## Association of Human Papillomavirus with Human Colorectal Cancer

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**Purpose :** The aim of this study is to confirm the association of human papillomavirus with colorectal cancer.

**Methods :** We studied 44 patients who were receiving operation for colorectal cancer from 1, Jan. 1997 Dec. at Korea University Guro Hospital. We used para-embedded tissue sections of colorectal adenocarcinoma and human cervical cell lines as a positive control. We studied 10 cases of anal canal squamous cell carcinoma. The extracted DNA were analyzed by polymerase chain reaction and enzyme restriction method.

**Results :** Human papillomavirus DNA was not detected in all specimens of colorectal adenocarcinomas. But in (30%) of anal canal squamous carcinomas, human papillomavirus DNA was detected. We identified this human papillomavirus DNA as type 16 by enzyme restriction technique.

**Conclusions :** Human papillomavirus usually associated with malignant transformation are present in anal canal squamous cell carcinomas. This study also showed same result that this association was absent from adenocarcinoma of colon and rectum. *J Korea Soc Coloproctol 2001;17: 336*

**Key Words :** Colorectal cancer, Human papillomavirus, anal canal squamous carcinoma

가 가

가

40

가

. Human

papillomavirus (HPV)

1,2

3-6

HPV type 6 11

(cervical intraepithelial neoplasia)

7 HPV type 16 18

HPV type 16

HPV type 18 33

8

HPV

HPV

. Kirgan

43%

가 HPV viral genome

(PCR)

32%

HPV viral genome

10

McGregor

11

Cheng

12

HPV genome

Shroyer

13

HPV genome

100% HPV ge-

nome

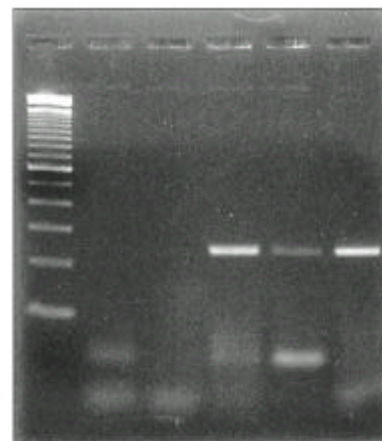
nome

HPV genome

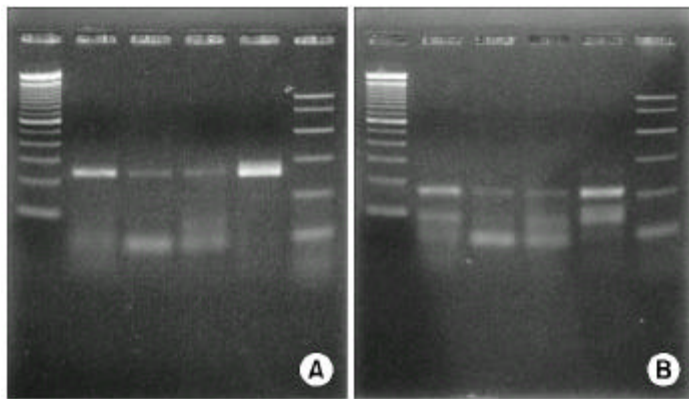
1997 1 1 12 31  
61 44  
19  
25 19 : 25  
8 , 3 , 2 ,  
S 6 , 25 가  
1992 1997  
10  
HPV genome DNA  
5 μM 37°C  
12 proteinase K , 300  
μl phenol/chloroform 가 ,  
12,000 rpm, 10 ( )  
300 μl chloroform/isoamyl alcohol  
가 , 12,000 rpm, 10  
. Ethanol 600 μl, 3 M  
CH<sub>3</sub>COONa 30 μl 가 -20°C, 1  
12,000 rpm, 10  
80% ethanol , genome  
DNA . PCR  
TaKaRa Taq (TaKaRa Code No. R001A/B/C)  
, Mineral oil 100 μl , 94°C  
30 , 55°C 2 , 72°C 2 30 cycles  
PCR . mineral oil  
10 μl 4% NuSieve 3 : 1  
Agarose , DNA  
DNA  
phenol/chloroform , chloroform , ethanol  
DNA . DNA  
Enzyme Set A (TaKaRa Code No. 6604)

HPV . Afa I  
HPV type 6 11 , Ava II  
HPV type 16, 18, 33

TaKaRa PCR Human Papillomavirus Typing Set  
type Human papillomavirus  
primer consensus  
HPV E6 E7  
primer (228 268 bp) PCR  
HPVpU-1M/HPVpU-2R primer HPV 16, 18, 31,  
33, 35, 52b 58 , HPVpU-31B/HPVpU-2R pri-  
mer HPV 6, 11 ,  
HPV Human cervical cell  
line .  
44 PCR HPV  
DNA , 10  
10 3  
230 bp  
HPV DNA가 30%  
(Fig. 1). DNA Afa I  
(Fig. 2A), Ava II 가 157  
bp 81 bp HPV type 16  
(Fig. 2B).



**Fig. 1.** PCR products of anal squamous carcinoma. Used 3% agarose gel. Lane 1 is size marker (100 bp), lane 2 is blank control, lane 3-5 is sample, and lane 6 is positive control. The lane 4 show the same PCR products as positive control, the size is around 230 bp.



**Fig. 2.** Restriction enzyme digestion. Used 3% agarose gel. Lane 1 is size marker (100 bp), lane 2-5 is sample, and lane 6 is promega size marker. (A) Under the Afa I digestion, the PCR products was not digested. (B) Under the Ava II digestion, the PCR products was digested and showed the band around 160 and 80 size marker.

**Table 1.** Reports-association HPV with colorectal tumors

Author	Colorectum (% Detection rate)			Anal cancer	Year	HPV
	Normal mucosa	Benign tumor	Malignant tumor			
Palmer JG, et al	—	—	—	56%	1989	HPV 16 DNA
Kirgan D, et al	23%	60%	97%		1990	HPV Ag
Kirgan D, et al		27%	43%		1990	HPV genome
Shroyer KR, et al			—	100%	1992	HPV genome
McGregor B, et al	8%	38%	32%		1993	HPV genome
Cheng JY, et al		28%			1995	HPV DNA
Cheng JY, et al		29.7%	52.9%		1995	HPV DNA

1987 Ostrow  
 16 HPV  
 1989 Palmer 17  
 56% HPV genome  
 Human Papillomavirus  
 , 1989 Kirgan 9  
 HPV  
 , 1990  
 6-8 Human papillomavirus  
 in situ DNA hybridization HPV  
 genome HPV  
 . 10 1993 McGregor 11  
 38%,  
 HPV type 16  
 8% HPV genome , 1995  
 6 가 Cheng 12  
 29.7%,  
 52.9% HPV genome  
 . 14 Human papillomavirs  
 HPV  
 , 1992 Shroyer 13  
 HPV type 16, 18, 31, 33, 35, 45, 51, 52, 58, 59  
 ,  
 가 type 16 18 HPV  
 , HPV  
 . 15 HPV  
 (Table 1). HPV

HPV

me DNA가 viral geno-  
 가  
 .<sup>18</sup> HPV type 16 E6 oncoprotein  
 , E7 on-  
 coprotein  
 .<sup>19</sup>  
 p53 pRb  
 .<sup>19</sup>  
 McGregor Cheng  
 HPV가  
 30 40%  
 가  
 Cheng  
 HPV-  
 16 가  
 HPV-16 가  
 44 10  
 HPV  
 HPV  
 30% HPV  
 Shroyer  
 HPV  
 HPV  
 HPV  
 HPV

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