

Circumcision – a role in treatment and diagnosis of penile lesions caused by human papilloma virus (HPV)

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KEY WORDS

HPV ► penile cancer ► genital warts ► phimosis
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ABSTRACT

Introduction. Infections with genital types of human papillomavirus (HPV) occur in all populations worldwide. Although HPV infection not always leads to penile cancer development, extended diagnostic procedures should be definitely carried out to detect the viruses, and after finding the infection, sparing treatment, which is fundamental for penile cancer prophylaxis, should be given. Cancer development due to symptomatic or subclinical infection, requires many years of chronic inflammation and various additional factors. Smegma remaining under the foreskin and phimosis are the examples of favorable conditions for cancer development in males. Own studies and ways of treatment of males with phimosis and foreskin lesions associated with HPV infection are presented.

Material and method. Own studies involved 56 males treated surgically by circumcision for phimosis and foreskin lesions (extended circumcision, i.e. radical posthetyomy with total excision of the inner lamina) and then widely diagnosed including virological investigations.

Results. HPV DNA was detected in 90% of the treated subjects. Seven patients required extensive operation for confirmed penile cancer, and the remaining 49 patients required organ-sparing circumcision.

Conclusions. We think it is necessary to carry out virological tests and cooperate with gynecologists in the diagnosis and treatment, to make possible, through early detection of HPV infection in sexual partners, treatment of male patients limited to organ-sparing operation.

INTRODUCTION

Infection with human papillomavirus (HPV) causes cutaneous and mucosal precancerous and cancerous lesions in males, located in the region of the external genitals, particularly on the penis [1]. Penile cancers (PC), regardless of the pathological mechanism of their development, in 50% of examined patients contain oncogenic HPV types, especially 16 and 18 [2]. Only in cases of verrucous carcinoma of the penis, genomes were found of non-oncogenic HPV 6 and HPV 54 types, which were the cause of condylomata acuminata. However, in many cases of PC the viruses can not be detected [3, 4]. In PC prevention, examination

of sexual partners is indispensable, particularly in cases of development of condylomata acuminata lesions in males, complicated with phimosis [5].

The extent of surgical operation presents a problem in the treatment of precancerous and cancerous penile conditions in view of the quality of life and maintenance of sexual functions [6].

The aim of the study was the diagnostic and therapeutic assessment of male patients with macular and papular lesions on the glans penis, prepuce and the region of the external urethral ostium treated with extended circumcision for phimosis.

MATERIAL AND METHOD

Since 1994, during operations for phimosis in 56 (100%) selected males aged from 38 to 74 years atypical lesions of local diffuse macular papular appearance were detected on the glans penis and prepuce as well as in the region of urethral ostium. These lesions were growing slowly, painlessly and were sometimes bleeding. That was the reason of performing diagnostic procedures, extended to include: peniscopy (examination of the urethral ostium and accessible part of the glans with a colposcope); cytodiagnosis of swabs from the urethral ostium and navicular fossa; virological tests to detect HPV DNA by polymerase chain reaction (PCR) and Hybrid Capture 2 methods; tests of cell-mediated immunity – determination of natural killer (NK) cell activity in blood, and the rosette test; and histopathological examinations of specimens and tissues excised during the circumcision procedure.

RESULTS

The HPV etiology of benign and malignant lesions was confirmed in 50 (90%) studied male patients. Based on histopathological examination, the following was found: planoepithelial carcinoma G3 (HPV 16/18) in three men, in whom partial phallectomy was carried out; spinocellular carcinoma in another four males, in whom total phallectomy was performed. The results in the remaining patients were as follows:

- in 18 cases carcinoma planoepithelial keratodes G1 (HPV 16) was found
- in 11 – papilloma (HPV 11 and 43)
- in another 7 cases – condylomata acuminata (HPV 6, 11)
- in the remaining 13 patients – a chronic inflammatory condition was diagnosed. In the above mentioned 49 patients extended circumcision, i.e. radical posthetyomy with total excision of the inner lamina was carried out.

Malignant lesions were found in 25 (45%) patients, and in the remaining 31 (55%) patients, benign changes were observed.

In the follow-up of the patients, no recurrence of pathological lesions was found as yet, either clinically, or in diagnostic tests.

DISCUSSION

Since 2000, the number of diseases of the skin and mucosa in genital regions in men has increased, particularly on the penis, and the incidence of human papillomavirus (HPV) infections has increased proportionally [7].

Currently, HPV is the cause of the most frequently developing sexually transmitted diseases. A constant increase is observed in the incidence of diseases connected with infections with genital types of HPV [8]. Infection with genital types of HPV develops transiently in about 50% of sexually active men and can remain in the subclinical phase [1]. HPV produces mucosal and cutaneous lesions in the region of the genitals. Subclinical infections in men and penile intraepithelial neoplasia (PIN) failed to provide data on the development of cancers, but can be the source of infection in female partners [9]. Malignant transformation of PIN is very rare [10]. In the case of chronic PIN lesions, good effect is obtained through early circumcision [11]. Examination of men having intercourse with female partners, in whom HPV infection markers were found on cytological examination of the uterine cervix, should be regarded as indispensable.

Own material peniscopy supplemented with cytological examination of swab taken from the navicular fossa of the urethra, contributed to the detection of subclinical HPV infections. By means of peniscopy, mucosal blanching phenomenon was found after application of 5% acetic acid (the sign characteristic of infection or inflammatory condition), making an accurate assessment of lesion surface, vascularization and mucosal condition possible. That also enabled differential diagnosis with leukoplakia and pigmented condylomata. Peniscopy only demonstrates the probability of HPV infection and is not a decisive examination [12]. In positive peniscopy examinations by C. Rosenblatt et al. [13] no HPV DNA was demonstrated in 57% of patients. The virological HPV DNA test of the material taken from the glans and urethral ostium in our material confirmed latent HPV carrier state.

At the same time, the HPV infection markers derived from squamous epithelium, detected on histopathological examination, formed the basis for the decision about organ-sparing operation for removal of the primary focus on the penis, i.e. extended circumcision. Other authors support almost total excision of the inner lamina, and they suggest that the complications arise mainly from sparing of the inner lamina [14].

To date, no recurrence of pathological lesions or signs of HPV infection was found in any of our patients. Demonstration on histological examination of the markers of HPV infection in squamous epithelium is an indication to sparing operation for removal of the primary focus on the penis. On the other hand, if penile cancer is confirmed by diagnostic procedures and tests, then the patient requires extensive surgical treatment.

CONCLUSIONS

The extended diagnostics of penile lesions made confirmation of HPV etiology possible in 90% of the studied males with phimosis. Demonstration of HPV infection in examination of squamous epithelium is regarded as an indication to sparing operation on the penis – extensive circumcision with resection of lesions. This allows for sparing the organ.

REFERENCES

1. Majewski S, Jabłońska S: *Human papillomavirus – associated tumors of the skin and mucosa*. J Am Acad Dermatol 1997; 36: 659-685.

2. Cupp MR, Malek RS, Goellner JR et al: *The detection of human papillomavirus deoxyribonucleic acid in intraepithelial, in situ, verrucous and invasive carcinoma of the penis*. J Urol 1995; 154: 1024-1029.
3. Micoli G, Nasca MR, Innocenzi D, Schwartz RA: *Penile cancer*. J Am Acad Dermatol 2006; 54: 369-391.
4. Rubin MA, Kleter B, Zhou M et al: *Detection and typing of human papillomavirus DNA in penile carcinoma: evidence for multiple independent pathways of penile carcinogenesis*. AMJ Pathol 2001; 159: 1211-1218.
5. Walczak L, Majewski S, Jabłońska S: *Zakażenia genitalnymi typami HPV u mężczyzn jako czynnik ryzyka rozwoju raka szyjki macicy u kobiet*. In: Majewski S, Sikorski M (eds): *Szczepienia przeciw HPV. Profilaktyka raka szyjki macicy i innych zmian związanych z zakażeniem HPV*. Czelej, Lublin 2006; pp. 107-117.
6. Witeska A, Dutkiewicz S, Walczak L et al: *Operacje oszczędzające w stanach przednowotworowych i rakach prącia po wykryciu infekcji wirusem brodawczaka ludzkiego (HPV)*. Urol Pol 1994; 47: 4, 256-261.
7. Baseman JG, Koutsky LA: *The epidemiology of human papillomavirus infections*. J Clin Virol 2005; 32 (1): 16-24.
8. Bergeron C, Jeannel D, Poreda J et al: *Human papillomavirus testing in women with mild cytologic atypia*. Obstet Gynecol 2000; 95: 821-827.
9. Schiffman M, Kjaer SK: *Natural history of anogenital human papillomavirus infection and neoplasia*. J Nat Cancer Inst Monogr Ch 2003; 31: 14-19.
10. Park KC, Kim KH, Youn SW et al: *Heterogeneity of human papillomavirus DNA in a patient with bowenoid papulosis that progressed to squamous cell carcinoma*. Br J Dermatol 1998; 139: 1087-1091.
11. Majewski S, Walczak L, Jabłońska S: *Wirusy HPV w łagodnych i złośliwych zmianach okolicy narządów płciowych i odbytu*; w: Majewski S., Sikorski M.: *Szczepienia przeciw HPV. Profilaktyka raka szyjki macicy i innych zmian związanych z zakażeniami HPV*, Czelej, Lublin 2006, pp. 87-106.
12. Markos AR: *The management of penile intraepithelial neoplasia In genitourinary medicine*. Int J STD AIDS 2003; 14: 314-319.
13. Rosenblatt C, Lucon AM, Pereyra EAG et al: *HPV prevalence among partners of women with cervical intraepithelial neoplasia*. Int J Gynecol Obst 2004; 84: 156-161.
14. Stark E, Steffens J: *Fehler und Gefahren bei ambulanten Operationen: Zirkumzision*. Urologe A 2003; 42: 1035-1038.

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