Invasive Squamous Cell Carcinoma of the Cervix Following HPV Immunization in a Nineteen-Year-Old Woman

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Abstract

The incidence of cervical cancer is very low in the United States. The American College of Obstetricians and Gynecologists' (ACOG) recommendations suggest cervical cancer screening (Pap tests) beginning at age 21 regardless of when sexual activity may have begun. However, there are a few young women who will develop cervical cancer. This paper presents a case of invasive cervical cancer in a 19-year-old female who had previously received the HPV vaccine series.

The incidence of cervical cancer continues to decrease with the current screening methods.[1] Cervical cancer is still the second most common cancer in women worldwide.[2,3] There are an estimated 11,270 new cases of cervical cancer along with 4,000 deaths in the United States annually.[1] Worldwide, there are about 500,000 cases and 270,000 deaths annually.[2] Human papillomavirus (HPV) infections are the most common sexually transmitted disease in this country; there are 20,000,000 American that are infected.[4] Six million people in this country become infected with the virus yearly.[4] Human papillomavirus infections are obtained after their sexual debut, but natural immunity in most healthy young women clears the infection within two years.[1] HPV infections are greatest in young women and decrease with ensuing age.[2] Most infections are asymptomatic.[5] Dysplasia is common in adolescents but most clears spontaneously.[1]

The HPV vaccine is effective immunologically against HPV types 16 and 18 but may not protect against other types.[1,6] Approximately 30% of cervical cancer is caused by other HPV types.[1] Currently there are 120 types of HPV.[2,5,7] Previous infections with HPV do not confer lasting immunity.[8] Persistent infection with an HPV is necessary for the development of cervical cancer.[8]

The ACOG Guidelines recommend initiating screening at age 21 years regardless of age of sexual debut; then screening every other year until age 29.[1] The incidence of cervical cancer in women younger than 21 years is 0.1%.[1] The American College of Obstetricians and Gynecologists reported 14 cases of cervical cancer in females aged 15 to 19 with an incidence of one to two women with cervical cancer in 1,000,000 females.[1,5] Beller and Abu-Rustum reported two cases of cervical carcinoma in 2009.[9] One of the cervical cancers was a poorly differentiated type with clear cell features on histological examination and was unrelated to HPV.[9] The other cancer was caused by HPV type 31 and not covered by the HPV vaccine.[9]

The following is a case of invasive squamous cell carcinoma of the cervix in a 19-year-old woman who had received the HPV vaccine at age 16.

Case Report

A 16-year-old female presented with her mother to get the HPV immunization series. She received the complete series of three shots. The following year she presented for prenatal care. A Pap test was performed as part of the prenatal profile; the results were mild dysplasia. Following delivery of her baby, a Pap test was performed as part of her postpartum check-up. The results

were Atypical Squamous Cells of Undetermined Significance – HPV High Risk sub-type negative. Following the guidelines, she was asked to return in one year for repeat Pap test. She did not return nor have a Pap test anywhere else. The following year, a Pap test was performed by a nurse practitioner at a rural clinic. The results were Atypical Squamous Cells- cannot rule out high grade-lesion. She was referred for colposcopy. The patient had recently married and was hoping for another child. Colposcopic examination suggested a high-grade lesion, confirmed by cervical biopsies showing carcinoma-in-situ (possibly early invasive squamous cell carcinoma). Loop electrosurgical excision procedure performed in our office showed micro-invasive squamous cell carcinoma.

She was referred to a gynecologic oncologist for consultation. A repeat cervical conization was performed showing invasive squamous cell carcinoma. A radical hysterectomy with pelvic and peri-aortic lymph node dissections was performed. The pathology report revealed moderately to poorly differentiated squamous cell carcinoma. No residual disease was present, and the lymph nodes were negative for tumor. The patient did well postoperatively. The long-term prognosis is excellent, although, of course, she cannot have more children.

Cervical cancer unfortunately does occur in young women less than 20 years of age. The ACOG Guidelines do not recommend beginning pap smears until age 21 regardless of age of sexual debut so traditional screening can miss the few cases. The case presented does not meet the recommendations for Pap test screening as above but was diagnosed by a Pap test as part of prenatal care initial studies. At the time the standard of care was initiating Pap tests three years after beginning sexual activity. With the current recommendations, Pap testing would not have been performed in this young woman.

Current explanations for cervical cancer in young women following HPV vaccination include:

- Approximately 30% of cervical cancer is caused by HPV types other than 16 and 18.[1]
- Some cervical cancers are unrelated to HPV infections altogether.[9]
- Adenocarcinoma of the cervix is unrelated to HPV.[9]
- Interval after vaccination may be unknown.[10,11]
- Vaccination may not be as effective as those vaccinated before sexual intercourse.[5]
- Cervical cancers related to currently undiscovered HPV types.[7]
- Poorly differentiated cancers may not have a relationship to HPV types.

Physicians who care for adolescent females should be aware of the ACOG Guidelines but at the same time realize that there are a few young women that will develop cervical malignancies. Postcoital bleeding or spotting, multiple sexual partners, and other high-risk factors may alert the physician that enhanced cervical cancer screening may be appropriate for the patient.

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