Recurrent Laryngeal Papillomatosis

Francis Sánchez de Losada

Recurrent laryngeal papillomatosis (RLP) constitutes the most common benign tumor of the larynx in the pediatric age group. The RLP is caused by the human papilloma virus (HPV). More than 100 types of HPV have been identified, based on nucleic acids sequencing, polymerase chain reaction (PCR) and direct hybridization analysis.

HPV types 6 and 11 have been isolated more frequently in RPL and represent almost 90% of all cases. HPV types 16 and 18 are less frequent yet have most often been associated with cancer. HPV type 11 has greater replication ability and a high tendency to recur.

Symptoms usually begins with progressive hoarseness, stridor and respiratory obstruction. A high inex of suspicion must be maintained for children who are misdiagnosed with recurrent laryngotracheitis; endoscopic evaluation is needed to rule out the presence of laryngeal papillomas.

This illness is frustrating and difficult to treat, due to its tendency to recur both locally and lower in the respiratory tract. The clinical course of laryngeal papillomatosis is unpredictable. RLP might respond to one or two surgical procedures or might be progressive or spontaneously disappear at puberty. No treatment, alone or combined, is able to successfully eradicate HPV.

Although histologically a benign lesion, the behavior of RLP is not benign. Due to location, small lesions in the airway of the child can produce a severe respiratory obstruction that is life threatening.

HPV establishes itself in the non-ciliated squamous epithelium, if during the surgical procedure or in the endotracheal intubation we traumatize the ciliated epithelium this heals as a non-ciliated epithelium. This action incites the transformation of the mucosa to papilloma formation.

The larynx is always at risk, the glottis is the most affected, followed by supraglottis and subglottis, but RLP may also be located at extra-laryngeal sites such as the trachea, bronchial tree, lungs, nasal cavity, oral cavity and esophagus.

Symptom onset is variable. HPV has been reported to manifest as early as the first day of life or as late as the octogenarian years.

Three clinical patterns are described according to symptoms onset:
1.- childhood-onset laryngeal papillomatosis;
2.- adult-onset laryngeal papillomatosis;
3.- childhood-onset laryngeal papillomatosis with persistence in the adulthood.
Sexual contact is considered the most common mode of virus transmission. However, inanimate objects, water and the birth canal have been implicated in HPV transmission. It is important in these patients to investigate whether the mother has active condylomatous lesions or previous genital condylomata because HPV has been recovered on nasopharyngeal swab from a third of infants born to mothers with active uterine HPV. Presumably the RLP occurs during exposure of a child's upper aerodigestive tract to the cervix and vagina of a mother with genital HPV infection during normal vaginal delivery. However, there are children that have contracted HPV and produced RLP in spite of being born by cesarean procedure, for which the spread way suspected is the hematogenous.
Macroscopically laryngeal papillomas are appreciated as irregular nodular masses of various sizes. RLP can be solitary or widespread, the surface is pale yellow to red, and the tissue bleeds easily. Histologically RLP is characterized by papillary fronds of multilayered benign squamous epithelium that contain fibrovascular cores, are extremely vascularized and the most important histological finding is the keratinization.
Children under age of three can be carriers of HPV type 11 and generally come from families from a low economic level and have high-risk factors to develop RLP.
Treatment goals: 1.- To keep a free airway. 2.- To Improve voice quality. 3.- To Prevent complications.
During the surgical procedure, preservation of the normal tissues as intact helps to prevent scarring in the larynx. Avoidance of unnecessary trauma to the epithelium helps to prevent stenosis and future papillomas.
Surgical management involves microsurgical instruments, laser or microdebrider. Even though laser has been used for a very long time, using the microdebrider technique has proved to be superior in the management of RLP due to its advantages like decreased surgical time, trauma to soft tissues, less cost and personnel, better voice quality and no differences in postoperative pain. Even though advantages exist, reports of increased rate of recurrences using the microdebrider are noted.
Several medical therapies have been tried as adjuvant therapy for RLP. Currently different alternatives have been used like: interferon alpha, indole-3-carbinol, photodinamic therapy (PDT), cidofovir, acyclovir, ribavirin, Isotetrinoin (cis-retinoid acid) and mumps vaccine. This therapy is used in those children in whom recurrence is frequent.
Finally although promising treatment for the RLP has been used, still no procedure alone or combination exists that can permanently eradicate the HPV. It is our commitment to improve the diagnosis and management of the disease and allow these patients to reach a better quality of life.

Recommended readings

1. Pediatric Otolaryngology. Bluestone y cols. Recurrent Respiratory Papillomatosis. Fourth edition. Vol.2, 1558-1563
2. Head and Neck Surgery Otolaryngolgy. Byron J. Bayley. Recurrent Respiratory Papillomatosis. Third edition. Vol.1, 1025-1038
3. Laryngosope: Jan 2003; 113 (1): 139-143
4. Myer et al: Laryngoscope, Vol. 109(7, Part 1). July 1999. 1165-1166. Use of a Laryngeal Micro Resector System.
5. El Bitar Arch Otol HNS, 2002; 128
6. J. Virol. 2003 February; 77 (3): 1927-1939. HLA Class II Polymorphisms and Susceptibility to recurrernt respiratory papillomatosis.
7. Anales Españoles Pediatr 2001; 55: 558-560. Papilomatosis laríngea recurrente: una causa de dificultad respiratoria progresiva.
8. Acosta L., Carrasquel B. Papilomatosis Laríngea en el Hospital de Niños J. M. de Los Ríos. 1990-1995. Acta Otorrinolaringológica de Venezuela, 1997;9 (2): 43-47.
9. Tipificación de Virus Papiloma Humano por reacción en cadena de polimerasa en Hospital de Niños J. M. de Los Ríos Caracas. Bastidas Yanet y cols. Acta Otorrinolaringológica de Venezuela