

## **Papilomatosis laríngea: presentación de un caso de necrocirugía**

*Laryngeal papillomatosis: presentation of a case of necrosurgery*

*Papilomatose laríngea: apresentação de um caso de necrocirurgia*

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## Resumen

**Introducción.** La papilomatosis laríngea (PL) es una enfermedad causada por el virus papiloma humano (VPH) con obstrucción de vías aéreas superiores. Su forma de contagio es mediante contacto directo, y es más frecuente en adultos, aunque puede aparecer desde la niñez y persistir durante la vida debido a la contaminación del producto al salir por el canal vaginal, donde la laringe generalmente es la más afectada y puede presentar desde signos leves como disfonía hasta otros más severos de obstrucción aérea. **Presentación del caso.** Corresponde a una femenina de 30 años con un embarazo de 37 semanas, la cual inició con síntomas de obstrucción de vías respiratorias superiores que desencadenó una muerte por anoxia causada por una papilomatosis laríngea. **Discusión.** La práctica de la necrocirugía conlleva a un proceso de enseñanza y aprendizaje que data de tiempos tan remotos como la antigua Grecia. Durante su procedimiento genera conocimientos para los expertos como para los alumnos que en ella participan, lo que coadyuva al proceso pedagógico del médico. Para el caso presentado cobra importancia la correlación fisiopatológica de una enfermedad dejada a libre evolución y las consecuencias tan funestas que provocó en una paciente obstétrica. **Conclusiones.** Con la presentación de este caso pretendemos visibilizar a las necropsias como un elemento formativo de inmenso valor para el estudiante y los expertos del área médica y afines, así como el valor para las ciencias en general por la aportación sobre patología, epidemiología de las enfermedades, fisiopatología, entre otras, y la necesidad de realizar una exploración complementaria a lo pautado por las guías de práctica clínica en México a fin de evitar muertes como la presentada.

**Palabras clave:** anoxia, autopsia, laringe, neoplasia, papiloma, virus.

## Abstract

**Introduction:** Laryngeal papillomatosis (LP) is a disease caused by the human papillomavirus (HPV), with obstruction of the upper airways. Direct contact is the most frequent form of contagion in adults, although it can appear from childhood and persist throughout life due to contamination of the product when it comes out through the vaginal canal where the larynx is generally the most affected and can present mild signs such as dysphonia to severe signs of airway obstruction. **Case report:** corresponds to a 30-year-old female with a 37-week pregnancy, which began with symptoms of upper respiratory tract obstruction, which triggered death due to anoxia caused by laryngeal papillomatosis. **Discussion:** the practice of necrosurgery entails a teaching-learning process that dates back to times as remote as ancient Greece, during its procedure it generates knowledge for the experts as well as for the students who participate in it, contributing to the

pedagogical process of the doctor, to The presented case takes on the importance of the pathophysiological consequence of a disease left to evolve freely and the dire consequences that it caused in an obstetric patient. Conclusions: with the presentation of this case we intend to make necropsies visible as a formative element of enormous value for the student and experts in the medical area, as well as the value for the sciences in general for the contribution on pathology, epidemiology of the diseases, pathophysiology, among others, and the need to carry out a complementary examination as prescribed by the clinical practice guidelines in Mexico in order to avoid deaths such as the one presented.

**Keywords:** Anoxia, Autopsy, Larynx, Neoplasia, Papilloma, Virus.

## Resumo

**Introdução.** A papilomatose laríngea (LP) é uma doença causada pelo papilomavírus humano (HPV) com obstrução das vias aéreas superiores. Sua forma de contágio é por contato direto, sendo mais comum em adultos, embora possa surgir desde a infância e persistir ao longo da vida devido à contaminação do produto ao sair pelo canal vaginal, onde geralmente a laringe é a mais afetada e pode apresentar desde sinais leves, como disfonia, até sinais mais graves de obstrução aérea. **Apresentação do caso.** Corresponde a uma mulher de 30 anos, com gestação de 37 semanas, que iniciou com sintomas de obstrução de vias aéreas superiores que desencadearam óbito por anóxia causada por papilomatose laríngea. **Discussão.** A prática da necrocirurgia envolve um processo de ensino e aprendizagem que remonta a tempos tão antigos quanto a Grécia antiga. Durante seu procedimento gera conhecimento tanto para os especialistas quanto para os alunos que dele participam, o que contribui para o processo pedagógico do médico. Para o caso apresentado, torna-se importante a correlação fisiopatológica de uma doença que evoluiu e as consequências desastrosas que ela causou em uma paciente obstétrica. **Conclusões.** Com a apresentação deste caso pretendemos dar visibilidade às autópsias como um elemento de formação de imenso valor para o estudante e especialistas das áreas médicas e afins, bem como de valor para a ciência em geral pelo contributo na patologia, epidemiologia das doenças, fisiopatologia, entre outros, e a necessidade de realizar exame complementar conforme prescrito pelas diretrizes de prática clínica no México, a fim de evitar mortes como a apresentada.

**Palavras-chave:** anóxia, autópsia, laringe, neoplasia, papiloma, vírus.

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## Introduction

Cervical uterine carcinoma is one of the most frequent causes of public health in developing countries, which is generally caused by the human papillomavirus. In the case of Mexico, the country ranked fourth internationally in 2020 as a cause of death from cervical cancer (Roesch-Dietlen *et al.* , 2018)

The human papillomavirus occurs with various serotypes that affect the genital and extragenital regions. The laryngeal presentation is a site that is rarely explored during the comprehensive evaluation of the pregnant patient, hence its incidence is uncertain. In the case of maternal-fetal transmission, the virus is transmitted directly from the affected mother in the cervical-vaginal canal at the time when the product of conception passes through the birth canal and the fluids pass through the laryngeal cavity of the baby.

Laryngeal presentation in Mexico is around 48.7%, while in the USA a frequency of 21% -47.6% is reported, and in the United Kingdom a rate of 12.5% is reported; However, in Central America, a region with a greater cultural and epidemiological relationship (as in the Republic of Panama), it shows a higher laryngeal incidence of up to 65%. (Hernández-Girón *et al.* , 2005)

Symptoms can range from simple dysphonia to later changes that, depending on the lesions and size, can cause upper airway obstruction (Centurion Villalba *et al.* , 2018) . In more extreme situations, it can cause death, such as the case reported in Mexico, where the human papillomavirus was found by PCR in paraffin blocks with two high-risk genotypes: 18 and 16 (Jiménez-Herrera *et al.* , 2021 ; Tinoco and Juárez, 2019) .

During pregnancy, adaptive changes occur as a consequence of the relationship between the mother, the placenta and the fetus, within which there is predominantly a transitory state of immunosuppression caused by hormonal changes during pregnancy, which cause impaired cellular responses that increase the risk of certain infections, such as that generated by the human papillomavirus (Ramos-e-Silva *et al.* , 2016) .

Because it is such a common infection - between 10% and 60% of the condition in the general population, in the case of genital polypomatosis during pregnancy, there is a risk of evolving into pathological states such as mild, moderate dysplasia. or, in severe cases, carcinomas, a situation that favors transmission to the fetus during vaginal delivery (Alberico *et al.* , 1996) . Furthermore, as is known, maternal mortality is higher in developing countries, where almost a thousand women are reported per day, a situation that is not different in Mexico (Souza, 2015).

polypomatosis has a variable incidence and is caused by the human papillomavirus, especially subtypes six and eleven. Its transmission occurs directly during risky sexual practices,

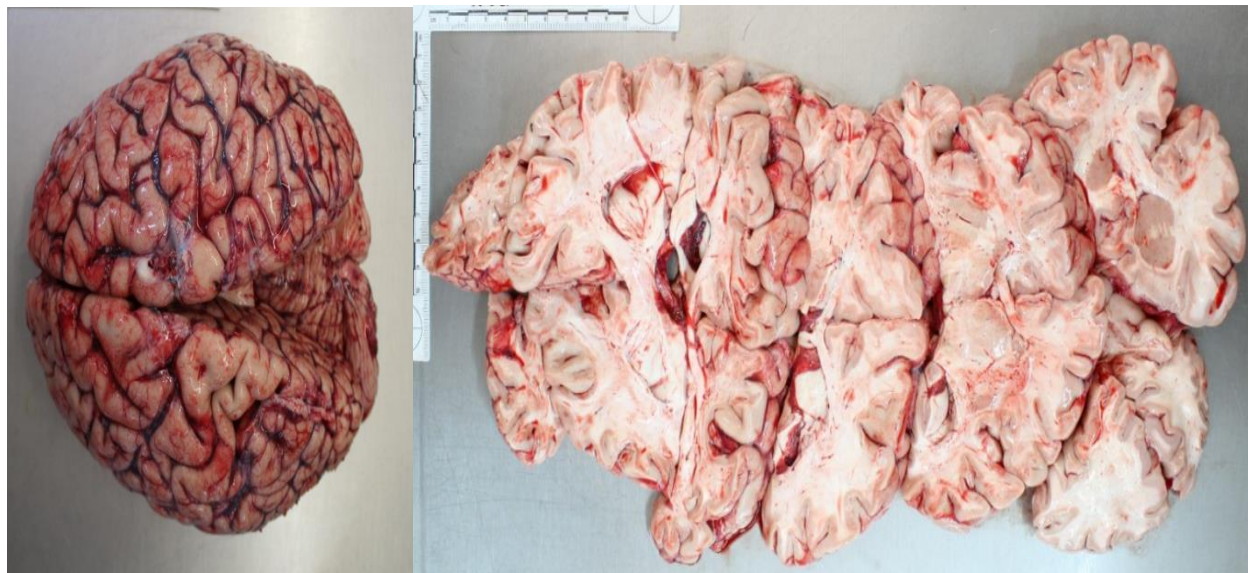
as well as through maternal-fetal transmission during childbirth. This virus is the cause of carcinoma in the cervix (Alvarado Ramírez, 2019) , and can be highly recurrent even in adults, with high recurrence rates.

Now, through the autopsy (internal and external examination of a corpse) four fundamental questions related to the case can be known: 1) determine the cause of death, 2) help establish the mechanism of death, 3) determine the interval *postmortem* and 4) help establish the identity of the deceased. Therefore, the practice of autopsy is a very useful technique for the doctor and the student, since it provides key information that helps the professional to establish an opinion in accordance with the elements reported by the medical examiner. In addition, it provides epidemiological data, natural history of the disease, disease-death causal relationship, diagnosis of pathologies not previously established, pathophysiological analysis of diseases and their organic manifestations. Therefore, its implementation in the forensic field contributes to the education of both health professionals and other areas as diverse as criminology, criminology, forensic photography, pedagogy, mathematics, statistics, etc. (Vargas-Alvarado, 2022) .

### **Case presentation**

The case of a 30-year-old woman is presented, who at the time of performing the required necrosurgery was seven months pregnant. His condition began at home with difficulty breathing until he reached a pure anoxic state, where a diagnosis of death was established due to secondary mechanical anoxia due to airway obstruction due to laryngeal polypomatosis, which obstructs more than 90% of the lumen. During the opening of the cranial cavity, congestive brain tissue secondary to cerebral edema was observed (figure 1).

**Figure 1.** Photography of internal organs



Note: At first glance, the findings in the cranial cavity are observed, which consisted of a congested brain with areas of pinpoint hemorrhage and flattening of convolutions, as well as narrowing of the fissures secondary to cerebral edema. In the right image, coronal sections of the brain are visible with generalized congestion and flattening of fissures. Source: Own elaboration.

Upon opening of the thoracic cavity, congested lungs were observed, with the presence of Tardieu spots, as well as crepitation upon manipulation, with no fluid outlet through the bronchial tree or trachea (figure 2).

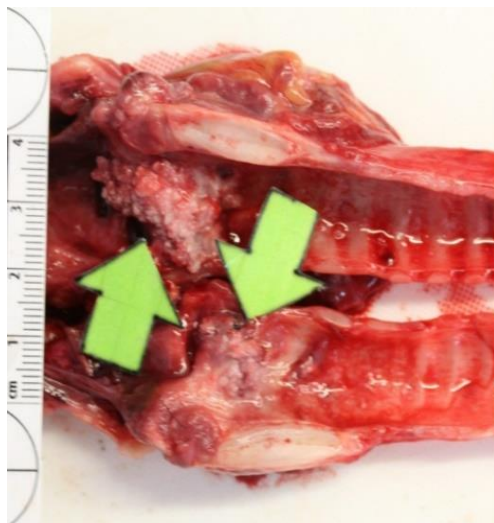
**Figure 2.** Photograph of lung tissue



Upon examination of internal organs, it reveals a macroscopic image corresponding to the lungs without prior fixation, in which generalized vascular congestion is observed, as well as the presence of subpleural petechial lesions consistent with Tardieu's spots. No pathological alterations were found in the cutting of lung parenchyma and trachea. Source: Own elaboration.

When the neck was opened through anatomical planes, the larynx was taken to the subglottic level; After the thyroid cartilage, an exophytic lesion was observed (figures 3 and 4), which obstructed a large part of its lumen, a situation that caused a hypoxic state and subsequently death due to anoxia. Other organs without visible lesions, genital area without lesions.

**Figure 3.** Photograph of the larynx through a posterior section

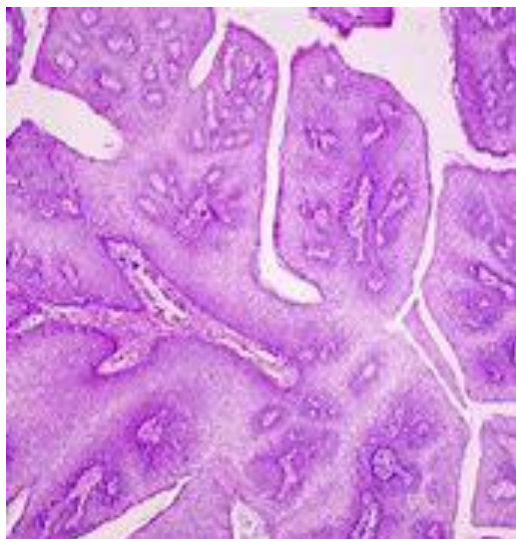


Note: Macroscopic photograph of the larynx with an anterior and posterior cut where an exophytic lesion is observed on the posterior and lateral aspects of the thyroid cartilage, which obstructed more than 90% of the upper airway. Source: Own elaboration.

The observed lesion was subjected to histopathological examination by routine histological technique using tissue previously fixed with 10% buffered neutral formalin. Subsequently, the tissue was processed in 70°, 80°, 96° and 100° alcohols to transfer the sample to the diaphanization process with xylene and embed the tissue in paraffin. Histological blocks were then made, as well as sections with a rotating microtome (Leica RM 2125) at 4 microns thick using a hematoxylin and eosin-based stain. In the microscopic evaluation (Olympus Cx22 microscope) it was confirmed that the lesion observed during necrosurgery corresponded to a laryngeal papillomatosis (figure 4), with which an accurate thanato -pathological diagnosis was determined.



**Figure 4.** Histological photomicrograph



Note: Photomicrograph at 10x with H&E technique, where the lesion showing acanthosis, papillomatous stalks, exophytic growths, without cellular atypia, and a prominent vascular stalk can be observed. Source: Own elaboration.

## Discussion

When performing necrosurgery, the corpse is respected in all cultural areas and spheres. In fact, according to prevailing beliefs in many countries, you have personal protection rights that continue to be effective *postmortem* , meaning that a person's dignity must be respected even after death. The religious beliefs of the deceased and the bereaved require special consideration. The legal basis in Mexico for the autopsy is found, on the one hand, in the general health law, specifically in the regulations of the general health law regarding sanitary control of the disposal of organs, tissues and corpses of human beings and , on the other hand, in the federal criminal code regarding crimes for burials, exhumations and respect for the deceased ( Federal Penal Code, 1931; Reinhard *et al.* , 2014) .

The aforementioned laws contribute to the practice of necrosurgery for the assimilation of knowledge from both experts in the forensic field and other sciences and their students, based on a theoretical and practical teaching model that has been carried out since ancient times, such as example Alcmaeon of Crotona (5th century BC), Greek scholar and philosopher of the Pythagorean school , considered the first scientist who practiced anatomical dissections in order to know the

place where intelligence was located (in the Aristotelian conception, it was the heart). Likewise, the case of Hippocrates of Cos (460-370 BC), ancient Greek doctor, considered the father of medicine, who was the first to write about human anatomy based on the inspection of human skeletons and patients with various injuries. (Alvarado Ramírez, 2019) .

Now, in the context of the underlying pathology that caused the anoxic condition in the patient, a retrospective study carried out in the period 2012-2017 in Ecuador was located, where 34 patients with laryngeal papillomatosis, of which 88.24% began in adulthood with a male/female ratio of 2.09:1, the age of diagnosis varied between 3-75 years (with an average of 45.41 years), and its predominant symptom was dysphonia with 97.06%. The main anatomical site of injury was the vocal cords (85.29%), out of a total of 23 patients.

However, it should be noted that in the patient in the case presented, no other related symptoms were reported prior to the time of death by family members, and agreement was found with the site of presentation of the injury. On the other hand, the authors reported that 8% of the patients had a squamous papilloma without dysplasia (65.21%), a situation identical to our case. In another 5 patients they evolved towards remission, 5 with persistence and 13 with post-surgical recurrences (Ramos-e-Silva *et al .*, 2016) .

In the case of laryngeal papillomatosis, the condition in the upper airways is generally caused by human papillomavirus types 6 and 11. Although this virus does not generate malignant neoplasms, it does present metaplastic or dysplastic lesions at the site of infection, such as the genital and extragenital region (laryngeal region) (Cuestas *et al .*, 2018; Lugo *et al .*, 2017) .

The lesions are highly recurrent, recurrent and difficult to manage. These can be treated with medications such as cidofovir intralesional , which serve as an effective adjuvant treatment for recurrent respiratory papillomatosis (Ballestas *et al .*, 2021) . In addition, laser treatments can be used, as described in a series of cases reported in a total population of 227 patients, in which lesions compatible with papillomatosis were found in 185 patients (81.49%), of which the pathology was localized. in the larynx in 17 cases (7.48%) with a laryngotracheal condition, 11 (4.84%) presented tracheal involvement, 6 (2.64%) in the tongue, 4 (1.76%) in the pharynx, 2 (0.88%) in the nose and 1 ( 0.44%) in the esophagus and bronchi. Laser treatment resolved laryngotracheal lesions in a single session, and 31 patients in several sessions. Specifically, laryngeal papillomatosis and subglottic stenosis were the pathologies that required multiple treatments ( National Center of Technological Excellence in Health, 2017; Gutiérrez Castillo *et al .*, 2010) .

Pregnancy occurs with a temporary state of immunosuppression in which the immune system must adapt to a foreign organism and not generate an exaggerated immune response that ends up damaging the product of conception. During this state, pathologies that previously did not cause an alteration in the organism can emerge, as in the case of infection by the human papillomavirus, which tends to have a greater expression and severity of the lesions present in immunosuppressed organisms, which It causes rapid growth in the respiratory tract that can lead to death due to asphyxiation. This is without taking into account that pregnancy carries an intrinsic risk for the mother, especially in developing countries, where almost a thousand women have died from this cause (Souza, 2015).

In Mexico, there are national clinical practice guidelines related to pregnant women and their care at the three levels of health. These represent the cornerstone in the management of obstetric patients, and are the following: comprehensive preeclampsia care at the second and third levels of care; detection and treatment of hypertensive diseases in pregnancy; detection and treatment of obstetric emergencies; diagnosis and management of preterm birth; diagnosis and treatment of diabetes in pregnancy; diagnosis and treatment of obstetric hemorrhage; diagnosis and treatment of sepsis; prevention and management of postpartum hemorrhage; reduction in the frequency of cesarean section surveillance, and management of labor in low-risk pregnancy.

In none of them is the prophylactic performance of a laryngeal examination in search of papillomatous lesions recommended, so most of the time the detection of this pathology will be unnoticed by the clinician, especially if there are no clinical symptoms of obstruction in airways, as was the case of the patient presented. This means that in cases with transient events of dysphonia and stridor symptoms, alternating with periods of remission, they can lead the treating physician to a more or less timely diagnosis (Castillo *et al.* , 2015) .

Finally, it should be noted that laryngeal papillomatosis has a variable incidence, although it is more common in developing countries and in children born through childbirth, who become infected in the canal (Alvarado Ramírez, 2019) , and can be highly recurrent in children. adults with high recurrence rates. The predominant age in adults is between the second and fourth decades of life, a situation consistent with the case presented. That is, the younger a papillomatosis begins, the higher the recurrence and persistence tends to be, since it becomes malignant in an average of 20 years, with a location in the sinuses of Morgani and in the subglottic region of the larynx.

## Conclusions

Laryngeal papillomatosis is a complication caused by the human papillomavirus, which occurs more frequently in developing countries. There are various medications and treatments (for example, laser and surgical removal), which have greater therapeutic value. This condition is highly recurrent and on some occasions can have a malignant transformation towards a high or low grade squamous cell carcinoma, hence it is important that the entity is always confirmed with a histopathological study.

In the present case it had an outcome. The path of the disease to free evolution is shown, which lacked maternal and child management and a timely diagnosis. In other words, a maternal death could have been prevented if the glottic region and larynx had been explored early, since the diagnosis was late and was not carried out until necrosurgery. This case demonstrates the need to take laryngeal exploration as part of medical routine.

As a preventive measure to reduce the risk of contamination, experts recommend the application of the papillomavirus vaccine to all children between 11 and 12 years old. In this sense, there are bivalent and quadrivalent vaccine formats, also useful for men. In short, the pregnancy must be monitored by the specialist in the maternal and child stage to prevent diseases that alter the health of the couple, since, in the specific case of Mexico, the challenge of reducing maternal deaths remains pending.

## Future lines of research

Laryngeal papillomatosis is a condition that can become recurrent, occasionally producing symptoms such as hoarseness, stridor, and airway obstruction. The management of choice is surgical, and most surgeons use microdebrider laser techniques. Transoral robotic surgery (TORS) has been successfully used for the excision of oropharyngeal malignancies as well as pediatric airway surgery, so new therapeutic approaches could employ these novel surgical techniques (Tan Wen Sheng *et al.* , 2018) .

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