Revista de Ciencias Médicas de Pinar del Río

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6983

CASE PRESENTATION

Clinical manifestations and management of tuberous sclerosis

Alison Dennise Santamaria-Enríquez[1], Giuliana Nicole Lara-Flores[1], Carlos Alberto Pérez-Padilla[1], Zaihrys del Carmen Herrera-Lazo[1]

[1]Universidad Regional Autónoma de Los Andes (UNIANDES). Ambato, Ecuador.

Received: December 16, 2025
Accepted: December 20, 2025
Published: December 23,2025

Citar como: Santamaria-Enríquez AD, Lara-Flores GN, Pérez-Padilla CA, Herrera-Lazo Z del C. Manifestaciones clínicas y manejo de la esclerosis tuberosa. Rev Ciencias Médicas [Internet]. 2025 [citado: fecha de acceso]; 29(S1): e6983. Disponible en: http://revcmpinar.sld.cu/index.php/publicaciones/article/view/6983

ABSTRACT

Introduction: tuberous sclerosis is an autosomal dominant genetic disorder that causes multisystemic benign tumors, with neurological, renal, ocular, and cutaneous involvement.
Objective: to describe the clinical manifestations and multidisciplinary management of a case of tuberous sclerosis in an adolescent.
Case presentation: a 15-year-old male patient of mestizo origin from Ambato, with a family history of similar cutaneous lesions, was evaluated. Physical examination revealed facial angiofibromas, shagreen patches, periungual fibroma, and hyperpigmented macules. Ophthalmologic assessment showed bilateral hamartomas in the papilomacular area with altered vascular pattern and decreased visual acuity in the right eye. Complementary studies demonstrated renal cysts and a left renal nodule classified as bosniak III. Consultations were carried out with dermatology, pediatrics, and ophthalmology, in addition to abdominal ultrasound, brain magnetic resonance imaging, and chest radiography. Management focused on multidisciplinary follow-up and periodic monitoring of clinical manifestations.
Conclusions: this case highlights the need for a comprehensive approach to tuberous sclerosis, where early identification of cutaneous and ocular lesions allows prevention of complications. Multidisciplinary follow-up is essential to preserve quality of life and functionality.

Keywords: Tuberous Sclerosis; Skin Manifestations; Neurologic Manifestations; Eye Manifestations; Signs and Symptoms.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6983

INTRODUCTION

Tuberous sclerosis (TS) is a hereditary, autosomal dominant neuro-oculo-cutaneous syndrome with systemic repercussions, where 80 % of cases present a mutation in the TCS2 gene and 20 % are caused by a mutation in TSC1.[1] It mainly affects children and adults, and being multisystemic, it affects many organs, causing tumors (hamartomas) in the skin, kidneys, brain, heart, eyes, lungs, or oral cavity. It can include disabling neurological disorders such as epilepsy, intellectual disability, and autism.[2]

Two genes responsible for ET have been identified. The TSC1 gene, located on chromosome 9q34, encodes a protein called hamartin, and the TSC2 gene, located on chromosome 16q13, encodes a protein called tuberin. Mutations in these genes lead to the development of hamartomas in various organs, which can become malignant.[3]

Clinical manifestations are varied, affecting most organs since hamartoma formation can occur in multiple systems. Ocular, cardiac, dermatological, renal, and neurological manifestations are the most frequent; some of the latter can occur from childhood, including infantile spasms, difficult-to-treat epilepsy, cognitive disabilities, and autism.[4,5,6] Similarly, it is recognized that approximately 50 % of patients are asymptomatic and have a normal IQ. The main neurological abnormalities in ET are occasionally visible prenatally, making neuroimaging essential for diagnosis. [7,8,9,10]

The diagnosis of ET can be clinical or genetic. The genetic criterion (identification of a pathogenic mutation in TSC1 or TSC2 by genetic testing [although between 10–25 % of clinically compatible cases do not present an identified mutation]) provides the definitive diagnosis if met. However, given the impossibility of performing this study due to its complexity and high cost, clinical diagnosis is generally used, based on a series of 11 major and six minor diagnostic criteria, recently revised in 2021 and universally accepted, which are:[11]

- Major Criteria (each one has high diagnostic value)eitherstic)
  - Facial angiofibromas (≥3) or forehead plaque.
  - Non-traumatic hypomelanic macules (≥3 of at least 5 mm in diameter).
  - Non-traumatic nail or periungual fibromas (≥2).
  - Shagreen plaque (connective tissue lesion in the lumbosacral region).
  - Multiple retinal nodular hamartomas.
  - Cortical tubers or cortical dysplasias.
  - Subependymal nodules.
  - Subependymal giant cell astrocytoma.
  - Cardiac rhabdomyoma (single or multiple).
  - Pulmonary lymphangioleiomyomatosis.
  - Renal angiomyolipomas (≥2).

- Minor Criteria (support the diagnosis)eitherstic if they are combined)
  - Dental pits randomly distributed in the enamel (≥3).
  - Oral fibromas (≥2).
  - Non-renal hamartoma (with histological confirmation).
  - Achromic retinal plaque.
  - Confetti-like skin lesions.
  - Multiple renal cysts (with histological confirmation).

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6983

A definitive diagnosis is considered to be made when the patient presents two or more major criteria, or one major criterion accompanied by at least two minor criteria, reflecting a high probability of the disease. On the other hand, a possible diagnosis is established in cases where only one major criterion or two or more minor criteria are identified, suggesting the need for clinical follow-up and further evaluation to confirm or rule out the condition. This classification helps guide the diagnostic and therapeutic approach, especially in contexts where genetic confirmation is unavailable or inconclusive.

Treatment for tuberous sclerosis (TS) can be specific and/or asymptomatic. Specific treatment consists of drugs that act on the mTOR pathway, slowing the growth of tumor lesions, but the optimal treatment duration, ideal maintenance dose, and long-term consequences are still unknown. Symptomatic treatment can be pharmacological and aims to improve the patient's quality of life, as well as prevent complications. It is varied and ranges from common medications such as simple analgesics to complex procedures such as organ transplants, depending on the patient's needs.[12] Considering the above, the present study was conducted to describe the clinical manifestations and multidisciplinary management of a case of tuberous sclerosis in an adolescent.

CASE REPORT

Male patient, 15 years of age, mestizo, from the Canton of Ambato, Province of Tungurahua, occupation student, with blood group O+; with personal pathological history: nasal fracture at age 5 and lesions in the nasal region of the nodule type, pain in knees and legs 3 years ago; family pathological history: mother with hearing and language disability, and father with the same type of lesions at the skin level.

The patient presented to the dermatology department of Ambato General Hospital on Tuesday, January 3, 2023, with vital signs within normal parameters. The patient presented with facial angiofibromas, Shagreen's plaques on the forehead, periungual fibroma on the third toe of the left foot, a café-au-lait spot in the infra-axillary region, and a hyperpigmented spot on the left hip. Multidisciplinary follow-up and consultations with ophthalmology, pediatrics, and pulmonology specialists were recommended for monitoring.

The patient was referred to pediatrics for a dermatology consultation due to suspected tuberous sclerosis. Physical examination revealed Chagrin's spots on the nose, several scattered tubercles, and confirmed facial angiofibromas. The patient was then referred to pediatric ophthalmology. The ophthalmological examination revealed the following visual acuity: right eye (OD): 20/200, left eye (OS): 20/30; right eye (OD): 20/50, left eye (OS): 20/20; normal vision; fundus: dilated; and in both eyes, a pearly white image (hamartomas) with poorly defined borders was observed in the papillomacular region, allowing visualization of the vascular pattern in both eyes (Fig. 1).

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6983

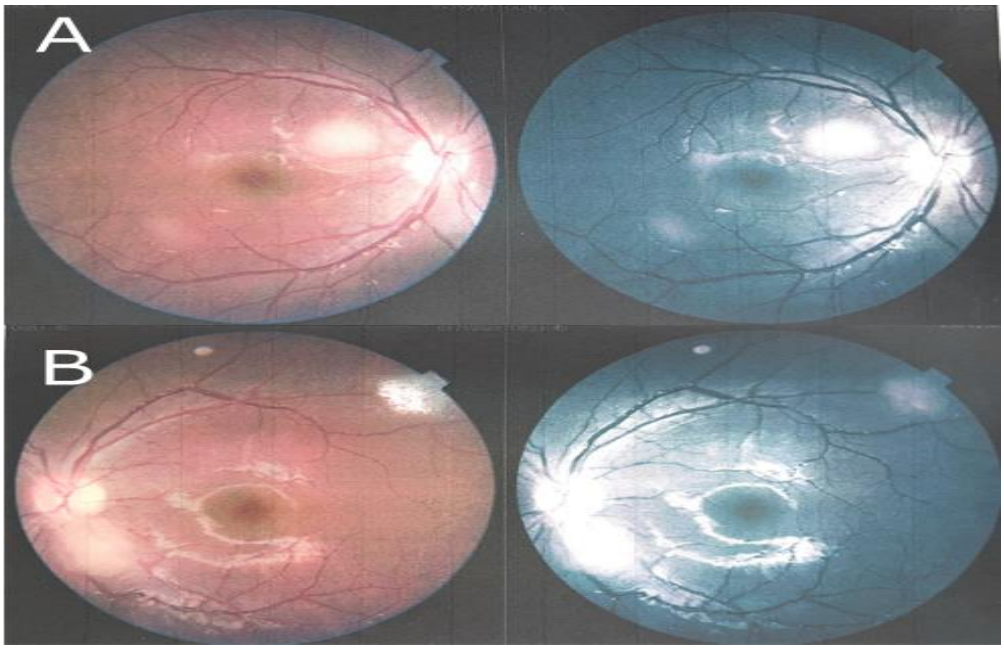

Fig. 1 Images of the fundus of the eye.

Further imaging studies were requested. An abdominal ultrasound revealed an echogenic parenchymal focus in the right kidney, which, given the patient's clinical context, should be ruled out as angiomyolipoma. A non-contrast abdominal CT scan showed the presence of Bosniak II right renal cysts and a Bosniak III left renal nodule. Treatment is primarily based on multidisciplinary management, follow-up, and regular monitoring of symptoms.

DISCUSSION

Bourvenil-Pringle syndrome (BP) is a congenital, autosomal dominant neurocutaneous disorder. It has been described since 1862, establishing major and minor diagnostic criteria. The incidence is 1 in 10,000 live births due to the multisystemic damage it can present; life expectancy is up to 35 years. It is characterized by hamartomatous lesions caused by mutations in the TSC1-TSC2 genes, which encode tumor suppressor proteins. Alterations are found in various organs, including the eyes, skin, heart, kidneys, brain, and lungs. It is suspected prenatally due to abnormal masses detected in imaging studies such as routine ultrasound; however, it can develop in childhood or adulthood.[13]

Clinical features can vary depending on the organ system affected and include developmental delay, tumors in the brain, eyes, heart, lungs, etc. The patient's disease expression was identified by family history, dermatological characteristics such as nodular lesions (angiofibromas) on the face, Shagreen's plaques on the forehead, a fibroma on the nail apparatus of the third toe, hyperpigmented spots on the hips, and ocular abnormalities (hamartomas). Patients with tuberous sclerosis may present with one or more skin lesions.[14]

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6983

Other cases of patients with tuberous sclerosis have presented with dental defects, and oral hygiene is recommended as a preventive measure. If complications arise, surgical excision is necessary. Regarding bone abnormalities, X-rays should be performed due to the risk of cyst formation. At the cardiac level, the distinctive feature is rhabdomyoma, a benign tumor identified in newborns through prenatal ultrasound. In adults without a history of cardiac symptoms, an electrocardiogram is recommended to evaluate for conduction defects.[15] Adults tend to develop renal cell carcinomas; follow-up should be conducted using imaging studies to monitor for malignant and benign tumors.

If a presumptive diagnosis is made, it is important to follow international guidelines, which include performing a complete eye examination and identifying any retinal abnormalities or visual field defects. Ophthalmological evaluations should be performed every three months. Early identification of these conditions can prevent complications and allow for interventions to preserve the patient's visual function.[16] Identifying neurological complications such as epilepsy is necessary for monitoring and educating family members to adhere to the initial therapy, which is generally with vigabatrin. Imaging studies such as magnetic resonance imaging (MRI) and computed tomography (CT) are recommended when the disease is suspected to assess whether the major or minor criteria are met.

Treatment is directed at the manifestations identified in this case, mainly on the skin and at the ocular level. Monitoring and sun protection should be recommended due to susceptibility to sunburn and DNA damage from ultraviolet rays. In this case, treatment is recommended due to the prominent skin lesions, which are considered to be increasing in size and number, in addition to the pain, bleeding, functional impairment, and social problems that they can trigger.[17] The appearance of this type of lesion can be improved with laser therapy and dermabrasion, in addition to complementing with topical pharmacological treatment of rapamycin inhibitors.

The management of patients with tuberous sclerosis should be carried out with a multidisciplinary approach due to clinical variability; specialists in Neurology, Dermatology, Ophthalmology, Nephrology and Cardiology should be integrated to be able to carry out the evaluation and follow-up according to the particularities of the patient.[18] The prognosis depends on the individual characteristics of each patient; neurological complications and those triggered in other organ systems are a cause of morbidity in adolescents and adults and have a higher incidence.

CONCLUSIONS

Transient thyroid disease (TTD) is a genetic disorder caused by mutations in the TSC1 or TSC2 genes, which lead to a loss of control over cell growth and the development of benign tumors in organs such as the brain, kidneys, skin, and lungs. Its clinical manifestations are variable and can include seizures, skin lesions, facial angiofibromas, ocular abnormalities, kidney tumors, gingival fibromas, and cardiac rhabdomyomas, sometimes present from birth. Diagnosis, which presents a clinical challenge, is established through medical history, family history, major and minor criteria, genetic testing, and imaging studies such as CT scans, ultrasound, and MRI. Although there is no cure, multidisciplinary treatment aims to control symptoms and reduce complications, requiring periodic follow-up with imaging studies every 1–3 years to detect disease progression and improve patient survival.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6983

BIBLIOGRAPHIC REFERENCES

1. Pedraza-Rodríguez EM, González-Velázquez VE, Villar-Gacives DA, et al. Esclerosis tuberosa, reporte de un caso. Universidad Médica Pinareña [Internet]. 2021[citado 29/07/2024];17(2): e586. Disponible en: https://revgaleno.sld.cu/index.php/ump/article/view/586/0

2. Gómez Cerdas MT, Vargas Morales JA. Esclerosis tuberosa. Rev.méd.sinerg [Internet]. 1 de marzo de 2019 [citado 29/07/2024]; 4(3): 21-37. Disponible en: https://revistamedicasinergia.com/index.php/rms/article/view/182

3. Cervantes Blanco J. DESCRIPCION CLINICA Y ESTUDIO MOLECULAR DE UNA FAMILIA CON ESCLEROSIS TUBEROSA CON EXPRESIVIDAD VARIABLE [Internet]. UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO; 2019 [citado 29/07/2024]. Disponible en: http://repositorio.pediatria.gob.mx:8180/handle/20.500.12103/378

4. Carvajal Yañez N, Avedaño Jorge M. MANIFESTACIONES NEUROLÓGICAS Y CUTÁNEAS DEL COMPLEJO DE ESCLEROSIS TUBEROSA EN ADULTO. REPORTE DE UN CASO. Rev Cient Cienc Méd [Internet]. 2021 [citado 29/07/2024]; 24(1): 187-191. Disponible en: file:///C:/Users/User/Downloads/Dialnet-ManifestacionesNeurologicasYCutaneasDelComplejoDeE-9030215.pdf

5. Morales-González VA, Serrano Gloria G, Lara-Guevara MR, et al. Sclerosis tuberosa (Bourneville-Pringle disease): a review Questionnaire. Dermatología Cosmética, Médica y Quirúrgica [Internet]. 2024 [citado 29/07/2024]; 22(1): 57-65. Disponible en: https://www.medigraphic.com/cgi-bin/new/resumenI.cgi?IDARTICULO=115386

6. San Leandro Pardo DD, Felices Farias DJM, Cases Susarte DI, Tovar Perez DM, Sanchez Jimenez DR, Serrano García DC. MANIFESTACIONES INTRACRANEALES DE LA ESCLEROSIS TUBEROSA: CLAVES FUNDAMENTALES PARA SU DIAGNÓSTICO. SERAM [Internet]. 18 de mayo de 2021 [citado 29/07/2024]; 1(1). Disponible en: https://piper.espacio-seram.com/index.php/seram/article/view/4507

7. López Reboiro ML, Cerqueiro González JM. Beneficios de la protocolización en la atención de los enfermos con insuficiencia cardíaca. Galicia Clin [Internet]. 2021 [citado 29/07/2024]; 82(4): 182. Disponible en: https://galiciaclinica.info/gc/es/article/view/82-4-2737

8. De Sauto De Borbón E. Estudio clínico, genético y de calidad de vida de una cohorte de pacientes adultos con esclerosis tuberosa [Internet]. UNIVERSIDAD DE COMPLUTENSE DE MADRID; 2022 [citado 29/07/2024]. Disponible en: https://docta.ucm.es/rest/api/core/bitstreams/bfc772e9-9981-43eb-8a36-25ae687c99c9/content

9. Gupta N, Henske EP. Pulmonary manifestations in tuberous sclerosis complex. Am J Med Genet C Semin Med Genet [Internet]. 2018 [citado 29/07/2024]; 178(3): 326–37. Disponible en: https://pubmed.ncbi.nlm.nih.gov/30055039/

10. Cerisola A, Cibils L, Chaibún ME, Pedemonte V, Rosas M. COMPLEJO DE ESCLEROSIS TUBEROSA: DIAGNÓSTICO Y TRATAMIENTOACTUAL. MEDICINA (Buenos Aires) [Internet]. 2022 [citado 29/07/2024]; 82(Supl. III): 71-75. Disponible en: http://www.scielo.org.ar/pdf/medba/v82s3/1669-9106-medba-82-s3-71.pdf

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(S1): e6983

11. Bevilacqua Patriccia A, Quispe B C, Calderón María del R. Complejo esclerosis tuberosa en población aymara: relato de un caso. Gac Med Bol [Internet]. 2019 Jun [citado 29/07/2024]; 42(1): 70-73. Disponible en: https://www.redalyc.org/journal/4456/445674686012/html/

12. Bernal Botero LF, Arias-Ramírez YZ, Pineda Graciano CM. Complejo de esclerosis tuberosa: Perfil neuropsicológico y propuesta de intervención. Rev Investig Innov Cienc Salud [Internet]. 2020 [citado 15/07/2024]; 2(1):98–115. Disponible en: http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S2665-20562020000100098

13. García YF. "Esclerosis tuberosa en recién nacida. Hallazgos imagenológicos cardíacos y extracardíacos." Rev Fed Arg Cardiol[Internet]. 2020 [citado el 15/07/2024]; 49(4): 155-156. Disponible en: https://revistafac.org.ar/ojs/index.php/revistafac/article/view/155

14. Esmer-Sánchez MC, et al. "Respuesta a everolimus en un neonato con rabdomioma cardiaco asociado con el complejo esclerosis tuberosa. Reporte de caso." Acta Pediatr Mex [Internet]. 2020 [citado 15/07/2024]; 41(5): 208-214. Disponible en: https://actapediatrica.org.mx/article/respuesta-a-everolimus-en-un-neonato-con-rabdomioma-cardiaco-asociado-con-el-complejo-esclerosis-tuberosa-reporte-de-caso/

15. Rodríguez Sabillón JA, García de Vinuesa E, Roberto Robles N, Complejo Esclerosis Tuberosa. En: Lorenzo V., López Gómez JM (Eds). Nefrología al día [Internet]. Hospital Universitario de Badajoz. España; 2022 [citado 31/07/2024]. Disponible en: https://nefrologiaaldia.org/es-articulo-complejo-esclerosis-tuberosa-689

16. Northrup H, Aronow ME, Bebin EM, Bissler J, Darling TN, de Vries PJ, et al. Updated international tuberous sclerosis complex diagnostic criteria and surveillance and management recommendations. Pediatr Neurol [Internet]. 2021 [citado 31/07/2024]; 123: 50–66. Disponible en: https://www.sciencedirect.com/science/article/pii/S088789942100151X?via%3Dihub

17. Islam MP. Tuberous sclerosis complex. Semin Pediatr Neurol [Internet]. 2021 [citado 28/07/2024]; 37: 100875. Disponible en: https://pubmed.ncbi.nlm.nih.gov/33892851/