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Case Report

Vestigial human tail and occult spinal dysraphism: A case report

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ABSTRACT

Background: The presence of a human tail is a rare condition resulting from an embryonic remnant that fits the definition of a caudal appendage. It may be a vestigial (true) or a pseudotail. Both may be considered markers of underlying intraspinal abnormalities.

Case Description: The present case documents a 5-year-old girl with a caudal appendage in the lumbar region, with a previously normal neurological examination. Spinal magnetic resonance imaging (MRI) showed the presence of occult spinal dysraphism associated with a cutaneous appendage with lipomatous content. We performed microsurgical treatment to excise the lesion and explore the occult spinal dysraphism. A histopathological examination revealed mature adipose tissue with blood vessels and nerve fibers and no bone or cartilage tissue.

Conclusion: The presence of a tail-like appendage in the lumbosacral region must alert to the possibility of underlying occult spinal dysraphism. Preoperative assessment must include a complete neurological examination and a detailed MRI evaluation.

Keywords: Caudal appendage, Human tail, Spinal dysraphism, Vestigial

INTRODUCTION

The human tail has been classified as either a true (persistent vestigial) tail or a pseudotail.[2] This classification is not usually easy to do.[13] The true tail is thought to be a benign condition not associated with any underlying cord malformation,[2] although some authors have described cases of true tail related to spinal dysraphism.[13] The human tail has been documented since the early 1900s and corresponds to a benign congenital anomaly resulting in a lumbosacral dorsal cutaneous appendage. The main question was whether they might represent a form of reversion in the evolutionary process. As a rare occurrence, many manuscripts demonstrate the social impact of tails and their relevance as a cause of anxiety for the parents and, in some cases, a feeling of stigma and shame.[15] Nowadays, it is widely accepted that a human tail is a result of abnormal embryological development.[15] By 2020, approximately 60 cases had been documented in the literature.[1,6-9,11] We describe a rare case of a girl presenting a vestigial appendage associated with occult spinal dysraphism.

CASE REPORT

A 5-year-old girl was admitted with a tail-like structure that had been present since birth. In the midline of the lumbosacral region, a skin-covered, soft, non-tender, and nonfluctuating appendage, 6.5 cm in length and 2 cm in diameter, appeared similar to a human tail [Figures 1a and 1b]. No movement of the tail was observed, either spontaneously or by stimulation. Neurological examination was normal. Magnetic resonance imaging (MRI) showed a lumbosacral pedunculated appendage associated with the absence of posterior elements, characterizing an occult spinal dysraphism [Figure 2]. She underwent microsurgical treatment to excise the lesion and explore the spinal dysraphism. A midline incision was made encircling the base of the tail. The fat tissue from the subcutaneous area and the tail were excised [Figure 3a]. The lumbosacral fascia was exposed, and the absence of posterior elements S1–S3 was observed without an associated tract, confirming the occult spinal dysraphism. The skin defect was then closed. Histopathological examination revealed mature adipose tissue with blood vessels and nerve fibers, and no bone or cartilage tissue was found inside the structure [Figures 3b and c]. The skin involving the mass was deficient in hair follicles, sweat, and sebaceous glands. These findings were consistent with the presence of a vestigial human tail. The postoperative period was uneventful. At the 6-month follow-up, the wound had healed well with a satisfactory esthetic outcome.

DISCUSSION

The incidence of true human tails is observed to be twice as high in male patients as in female patients. Consequently, reports of this condition in females are relatively rare, making our case involving a girl particularly noteworthy.

The human tail is a rare vestigial appendage observed in the midline or just off the midline of the lumbar or sacrococcygeal region.[12,13] The presence of cutaneous midline congenital lesions – such as vascular nevi, tufts of hair, dermal sinuses, subcutaneous lipomas, deviated gluteal furrows, or a human tail – may indicate the presence of occult spinal dysraphism.[3,10] Over the years, the classification between a true tail and a pseudotail has remained contradictory.

Three cases of spinal dysraphism with tail-like cutaneous structures have been described,[2] highlighting that the classification of these appendages as true tails or pseudotails remains unclear. According to Tubbs *et al*.,[15], any appendages caused by regression disturbance of the embryonic tail can be classified as a true human tail. All other anomalies that may have a superficial resemblance but no embryological origin should be categorized as pseudo-tails.

The distinguishing features between true tails and pseudotails have been described, providing a basis for differentiation.[5] A true tail contains adipose and connective tissue, striated muscle, blood vessels, and nerves, all covered by skin. It lacks bone, cartilage, notochord, and spinal cord.[5,14] The pseudotail is an anomalous prolongation of the coccygeal vertebrae, lipoma, teratoma, chondrodystrophy, or parasitic

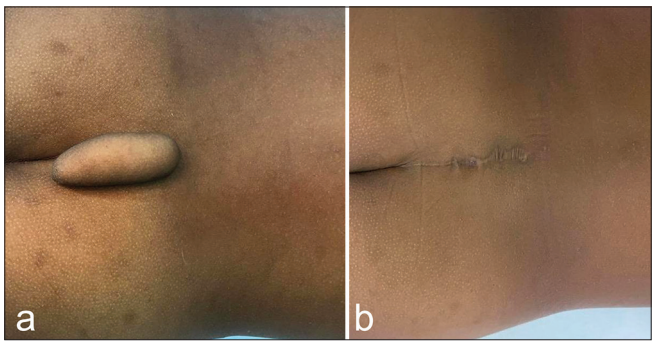

Figure 1: (a) Preoperative and postoperative of a 5-year-old girl with a tail-like soft structure in the midline of the lumbosacral region, a skin-covered, measuring 6.5 × 2 cm, in the posterior view. (b) At the 6-month follow-up, the wound had healed well with a satisfactory esthetic outcome.

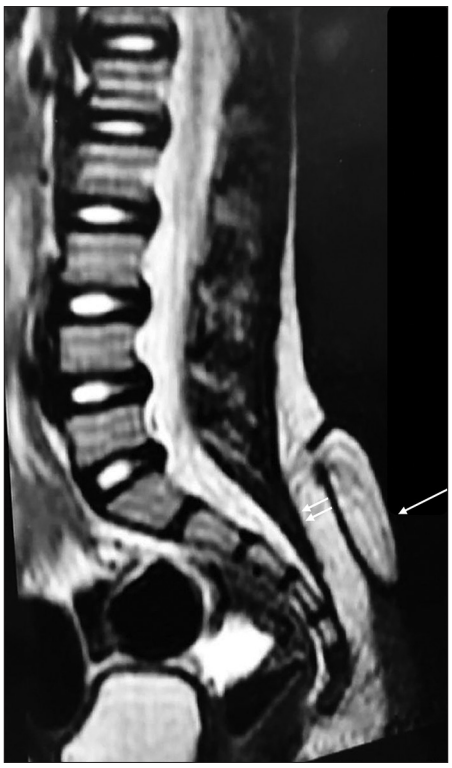

Figure 2: Sagittal T2-weighted magnetic resonance imaging scans showing a lumbosacral pedunculated appendage (single arrow) associated with the absence of posterior elements, characterizing an occult spinal dysraphism (double arrows).

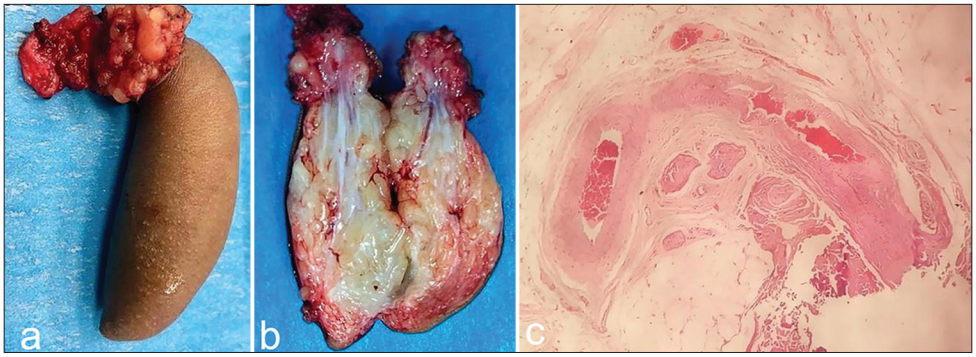

Figure 3: (a) Excision of the vestigial tail and underlying adipose tissue; (b) medial cut of the appendage surface; (c) Photomicrograph of the tail reveals mature adipose tissue with blood vessels and nerve fibers (Hematoxylin and eosin, ×100).

fetus.[4] The spinal cord begins to develop at the end of the 3rd week of embryogenesis by neurulation, secondary neurulation, and regression of the tail bud. During the 4th to 6th weeks, the embryo possesses a tail containing 10–12 caudal vertebrae, but a short distal portion containing mesodermal elements lacking bone is also present.[10] Generally, by the end of the 8th week, the tail fully diminishes, although the more proximal three to five vertebrae regress into the soft tissues and, later, form primary ossification centers that appear around birth. The segments slowly undergo fusion, which continues into adulthood.[6]

Wilkinson and Boylan[16] proposed a five-category classification system for caudal appendages: (1) soft-tissue caudal appendages: primarily composed of soft tissue; may have small inclusions of cartilage or bone; (2) bony caudal appendages: primarily composed of bone, including cases of sacrococcygeal eversion; (3) bony caudal prominences: surface manifestations of normal-but-prominent vertebrae; (4) true tails: remnants of embryonic tail, contain supernumerary vertebrae, and (5) other caudal appendages: do not fall into any of the other categories, include surface manifestations of various underlying abnormal structures.

The human tail has been characterized as a benign congenital anomaly.[3] The presence of a tail in a newborn represents the result of a defect during development and can be the principal cause of disorders of secondary neurulation and abnormal regression of the embryonic tail bud, linking the human tail and spine anomalies.[3-5,10] The cases of human tails published from 1859 to 1983 were summarized, and of the 33 cases reviewed, 23 were classified as true tails and 10 as pseudotails, while spina bifida emerged as the most frequent coexisting anomaly.[5] Furthermore, 59 cases with caudal appendages were reported, with 50% associated with either meningocele or spina bifida occulta.[10]

It is important to evaluate the presence of a tethered cord on MRI, which, in the present case, was not observed in any of the MRI sequences. In addition, it is important to remember that the absence of a fibrous or dermal tract attached to the dura does not rule out an abnormality of the filum terminale.

The present case involves a female child with a vestigial human tail, occult spinal dysraphism, and a normal neurological examination. Therefore, in addition to a thorough clinical examination, an MRI should be performed in every case of a human tail to assess for the possibility of spinal dysraphism before the surgical treatment for excision.

CONCLUSION

This case underscores the importance of early identification and comprehensive evaluation of caudal appendages in children. A vestigial tail may signal underlying conditions such as occult spinal dysraphism, highlighting the need for a detailed neurological examination and MRI to identify associated anomalies. Surgical management should address both esthetic and neurological considerations. Thorough assessment and proactive intervention are essential to achieve favorable outcomes in patients with these rare congenital anomalies.

Disclosures

The authors report no conflicts of interest concerning the materials or methods used in this study or the findings specified in this paper.

Ethical approval

The Institutional Review Board approval is obtained by the Ethics Committee of the Health Science Center at the Federal University of Espírito Santo under the number 39194620.0.0000.5060.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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