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CASE STUDY

EVOLUTION UNVEILED: A FEMALE NEWBORN WITH A TAIL!

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ABSTRACT

The birth of a newborn baby with normal morphology gives a feeling of delight, hope and gratitude to the parents as well as to the health care providers. However the sight of a baby born with an unusual caudal appendage resembling a tail creates an unusual emotion of apprehension, fear and shame. The appearance of a true human tail at birth, defined as *a caudal, vestigial, midline protrusion of muscle and adipose tissue with skin covering*, is an unusual event with less than 60 cases reported in the literature so far. Here we report a case of an otherwise normal female newborn baby, born with a tail, in view of the rarity of the occurrence and to discuss the related issues.

INTRODUCTION

A human tail is a rare congenital anomaly protruding from the lumbosacrococcygeal region. Some authors have considered this rare and curious condition to be evidence of man's descent from or relation to other animals, while others have made it the subject of superstition. Advanced imaging technology in recent decades has allowed more thorough investigation of these patients and better defined the association of such lesions with spinal dysraphism and tethered spinal cord .The present case stands unique being that of a female newborn baby born with an appendage resembling a tail with no neurological deficits or spinal cord anomalies

CASE REPORT

A female term newborn baby, the 2nd issue of a non consanguineous marriage was brought to the out-patient department immediately after birth for the investigation of a tail like structure present in the lumbo sacral area since birth. The baby weighed 2.7kg with apgar scores of 7 and 8 at 1 and 5 minutes respectively. There was no history of any significant medical illness, exposure to radiation, or drug intake during pregnancy. There was no family history of any congenital abnormality and her elder male sibling 2yrs of age had no similar findings at birth and was thriving well. Antenatal scans were not taken due to financial constraints.

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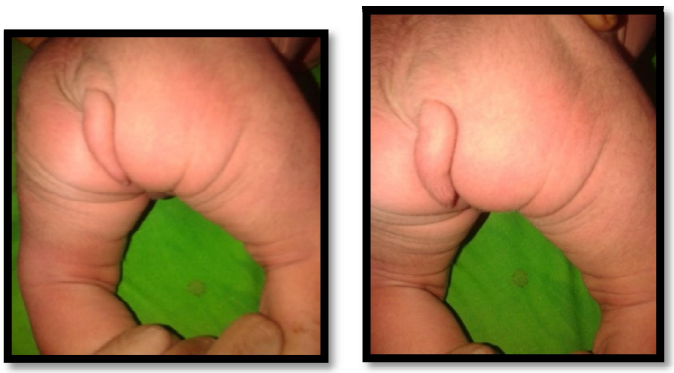
The child had normal activity and age appropriate reflexes. The general and systemic examination of neonate was normal except for a soft tail like tissue mass in the lumbosacral region. On detailed evaluation, the appendage was 5 cm long and was attached to the back tip of coccyx. It was well circumscribed, soft and non tender, covered with normal skin. No bony attachment or any voluntary movement was observed in the mass (Fig 1,2)



Figures 1,2. The tail like structure in the newborn female

Possibility of true neonatal tail versus pseudotail was considered. The neonate did not have any other congenital anomaly.

Radiography, Ultrasonography and MRI of the spine was normal. Patient was shifted to a higher centre due to lack of adequate facilities and planned surgery was undertaken by the neurosurgeon. The tail was removed and sent for histo

pathological examination which revealed that the tail like structure contained skin, muscle and adipose tissue only. Presently the baby is one month old weighing 3.8kg, accepting breast feeds and thriving well with no neurological deficits.

DISCUSSION

Human embryos have a tail that measures about one-sixth of the size of the embryo itself (Ledley, 1982). The embryonic human tail is composed of several complex tissues besides the articulating vertebrae including a secondary neural tube (spinal cord), a notochord, mesenchyme and tail gut. It is endowed with voluntary muscles in the core, blood vessels, nerve fibres, nerve ganglion cells and specialized pressure sensing nerve organs. By the eighth week of gestation, the sixth to twelfth vertebrae are completely eaten up by white blood cells with shrinking of the fourth and fifth vertebrae, and what remains is the fused coccyx, buried underneath the skin. Coccyx does not protrude externally, but retains an anatomical purpose of providing an attachment for muscles like gluteus maximus. The developmental tail is thus a human vestigial structure (Alashari and Torakawa, 1995; Dao and Netsky, 1984).

The dorsal cutaneous appendage, or so-called human tail at or after birth, is considered to be a marker of underlying intraspinal pathology of occult spinal dysraphism (Humphreys, 1996). However, certain authors have considered these to be a benign stigma without any cord malformations (Spiegelmann *et al.,* 1985). There have been many previous reports to date that spinal dysraphism is usually accompanied by several anomalies, including skin protrusion, pigmentation, sinus formation, human tail, and subcutaneousor spinal lipomas (Schropp *et al.,* 2006). As a consequence, a multitude of spinal cord and spine anomalies associations including spina bifida, meningocele, lipomeningoceles, myelomeningocele, intraspinal lipoma, spinal cord tethering, coccygeal vertebrae have been described in patients with human tail (Donovan and Pedersen, 2005). The present case demonstrates a cutaneous marker in the form of a tail at the back tip of coccyx in the absence of any coexisting malformations. Dao and Netsky (1984) reviewed 32 previous descriptions of tails published from 1859 to 1982. They distinguished true or persistent vestigial tails from other forms of caudal appendages or pseudotails. A true human tail is defined as a boneless, midline protrusion capable of spontaneous or reflex motion. The true human tail lacks vertebrae in all cases and is usually attached to the skin of the sacrococcygeal region. A pseudotail is a caudal protrusion composed of other normal and abnormal tissue for example, prolongation of the coccyx, vertebrae, lipoma or glioma.

Several theories have been developed to explain the development of spinal cord malformations. Recently, one generally accepted theory suggests that split-cord malformations originate from one basic error occurring around the time when the primitive neuroenteric canal closes. The basic error is the formation of an accessory neuroenteric canal between the yolk sac and amnion, which is subsequently invested with mesenchyme to form an endomesenchymal tract that splits the notocord and neural plate. Pluripotential cells of the endomesenchymal tract could develop into a variety of tissues consisting principally of mesodermal elements (Tubbs *et al.,* 2007). Thus, we can infer that disorders of secondary neurulation and abnormal regression of the embryonic tail bud may be the principal cause of this condition, but the exact mechanism is not known.

Familial cases have been reported (Dao and Netsky, 1984). In 29% of cases caudal appendages are reported to be associated with other congenital anomalies (Durbow *et al.,* 1988). Spina bifida is the most frequent coexisting anomaly. Cleft palate was reportedonce (Lundberg and Parsons, 1962). Spinal dysraphism should be excluded in all patients with caudal appendages prior to excision since neurosurgical intervention may be required (Belzberg *et al.,* 1991; Matsumoto *et al.,* 1994). A thorough neurological examination and imaging studies of the vertebral column are recommended to exclude this possibility (Kabra *et al.,* 1999). Several previous reports documented movement and contraction of tail (Dao and Netsky, 1984), whereas other reports indicated lack of movement of the tail (Alashari and Torakawa, 1995). In the present case no movement and contraction of tail was observed.

Microscopic examination of all true human tails showed skin covering a core of adipose tissue, collagen fibres and skeletal muscle fibres. No bone or cartilage has been documented. An associated lipoma (Belzberg *et al.,* 1991), lipomeningocele (Belzberg *et al.,* 1991; Matsumoto *et al.,* 1994), capillary hemangioma (Parsons, 1960), or juvenile hemangioendothelioma (Lundberg and Parsons, 1962), well developed neurones, glial fibres and calcification have been reported (Belzberg *et al.,* 1991). Thus we can infer that the caudal appendage called a true tail is better thought of as being a benign condition, a prolongation beyond the coccygeal or midgluteal region, and should not be associated with any underlying malformation (Spiegelmann *et al.,* 1985; Lu *et al.,* 1998). Simple excision is appropriate, that too for cosmetic reasons. In contrast, the caudal appendages mostly occurring with spina bifida occulta or spinal dysraphism are pseudotails. The appendage is only a cutaneous marker of underlying spinal dysraphism since the skin and nerve systems are related by their similar ectodermal origin. Surgical excision is not done only for cosmetic reasons. Further preoperative examination and complex surgical intervention are usually necessary.

A human tail can be easily identified during scanning of the fetal caudal region in the mid-sagittal plane. The possibly benign nature of the finding should be kept in mind and, a careful scan of the fetal spine is required in affected patients, to look for spinal cord anomalies.

In conclusion, the caudate appendage is not a medical difficulty to treat. But before the choice of the manner of treatment, it is necessary to evaluate the patient carefully in case of coexistence with lesions of intraspinal component. After the operation, a thorough histopathological examination of the mass is recommended to exclude teratomatous growth or other neoplasms (Alashari and Torakawa, 1995).

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