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Juvenile fibroadenoma arising in ectopic breast tissue presenting as an axillary mass



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ABSTRACT

The differential diagnosis of an axillary mass during childhood is extensive and malignant processes such as lymphoma or metastatic disease must be excluded. We describe an unusual case of a fibroadenoma growing within ectopic breast tissue located in the axilla in a 10 year old girl. The mass grew rapidly and was removed during an excisional biopsy. Histological evaluation revealed a diagnosis of fibroadenoma. Fibroadenoma of ectopic breast tissue has not previously been reported in the pediatric age group, and must be considered as part of the differential diagnosis for pediatric axillary masses.

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The human breast consists of glandular tissue surrounded by thoracic fascia and held in place by Cooper's ligaments [1]. Primary tumors of the breast in the pediatric population are rare and most often benign, with the most common diagnosis being fibroadenoma [2–6]. Most can safely be followed with serial examinations and a conservative approach [6]. Indications for surgical intervention include continual symptoms, rapidly growing or large masses, history of radiation therapy, history of malignancy, high risk genetic predisposition, and child's or parents' anxiety or fear [7].

Axillary masses are much more common in children than breast tumors. Although most axillary masses are due to lymph node enlargement secondary to infection, the differential diagnosis must also include metastases from a primary tumor such as rhabdomyosarcoma in the area of lymphatic drainage, lymphoma and leukemia, and a vascular or lymphatic malformation. We report a case of a 10 year old female who presented with a rapidly enlarging

axillary mass. On excisional biopsy it was shown to be a juvenile fibroadenoma with no evidence of malignancy.

1. Case report

A 10 year old female presented with a left axillary mass of 10 months duration. The child was previously healthy until 5 years, when she presented with myoclonic, atonic seizures. A diagnosis of mitochondrial disease was made with a mutation in the *POLG1* gene. At age 9, the patient's mother noticed an axillary mass, which was characterized as firm, nontender, and mobile and measured approximately 1.5 cm in diameter. Ultrasound revealed a solid mass with nonspecific features, with the most likely diagnosis being a lymph node. There was no similar mass on the right side. The mass continued to grow, and 5 months later was 3 cm in diameter. On physical examination she had no evidence of pubertal development. The mass was soft, nontender, and mobile, and there were no other masses and no lymphadenopathy in other regions. Excisional biopsy of the left axillary mass was undertaken.

The excised mass weighed 62 g, measured 7.5 × 5 × 3.5 cm, and showed a tan, smooth, homogenous appearance on cut section. Microscopic examination showed a fibroadenoma arising in ectopic breast tissue (Fig. 1). The lesion was incompletely surrounded by a thin fibrous capsule. Breast ducts lined by double layer epithelium were embedded within a fibrous stroma. No lobular tissue was

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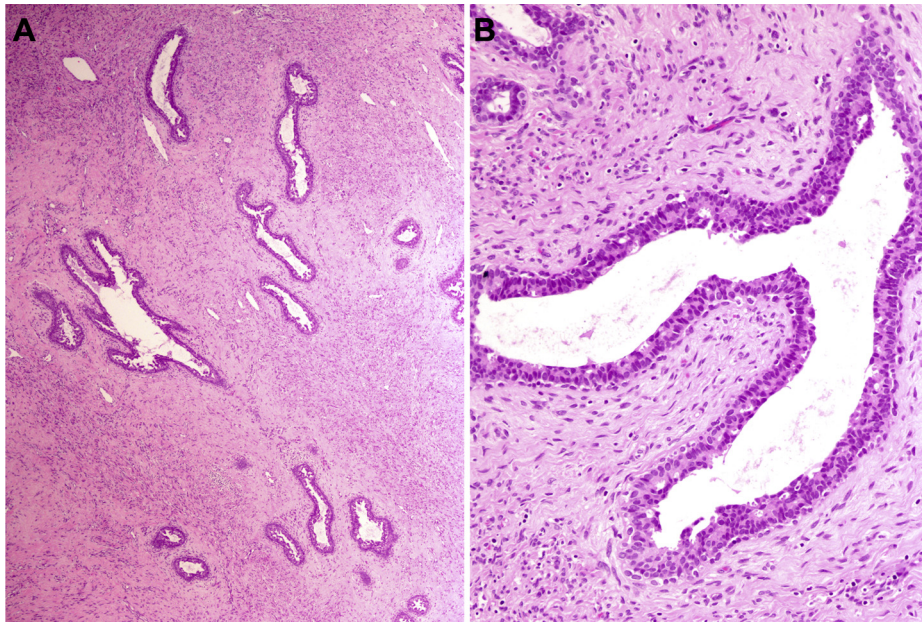


Fig. 1. Microscopic appearance of the fibroadenoma arising in ectopic breast tissue. (A) Breast ductal structures are embedded within a fibrous stroma; no lobular tissue is noted. (B) The ductal structures are lined by benign columnar epithelium and the stromal cells are fibroblastic in appearance without necrosis, significant mitotic activity, or nuclear atypia (hematoxylin and eosin, original magnifications A $\times 40$, B $\times 200$).

noted. The stroma showed focal hypercellularity, but no necrosis, significant mitotic activity, or nuclear atypia was seen.

2. Discussion

Ectopic breast tissue is found in about 2–6% of the population and can be subject to all of the pathological conditions that affect normal breast [8]. Development of breast tissue begins at approximately the sixth week of fetal life, as epidermal cells migrate downwards toward the mesenchyme and form the primitive mammary ridges or milk lines [3]. The ridges extend from the axilla through the thorax to the inguinal region and normally rapidly regress in all regions except the thorax [9]. During puberty, normal breast changes occur due to hormonal influences. The adipose tissue of the breast increases and ductal growth is stimulated by estrogen. Simultaneously progesterone acts on the breast to initiate alveolar budding and lobular growth [3]. Most commonly ectopic breast tissue presents during pregnancy though the age at presentation can vary [8]. Ectopic breast tissue can take different forms, including any of the normal physical elements of normal breast, such as glandular tissue and ductal elements in addition to connective tissue elements. Ectopic breast tissue has been reported in adolescence, and fibroadenoma is the most common cause of a mass in the normal adolescent breast [10,11]. Malignant breast tumors have been reported in ectopic axillary breast tissue, but never in children or adolescents [12]. Ectopic fibroadenomas in adults have been reported in other locations such as the perianal region and vulva; one pediatric vulval fibroadenoma has also been reported [13–16]. However a fibroadenoma within ectopic breast tissue in a pediatric patient has never been previously reported.

Our patient had a history of *POLG1* mutation. *POLG1* is a mitochondrial DNA (mtDNA) polymerase which, when mutated, leads to progressive depletion of mtDNA and eventual mitochondrial dysfunction [17]. Presentation of this disorder is varied in onset, signs, and symptoms. It most often causes progressive central and peripheral nervous system and liver dysfunction, which can vary in severity, time of onset, and progression. There have not been any

reports of a link between *POLG1* mutations and either ectopic breast tissue or benign breast masses.

The differential diagnosis of an axillary mass in an adolescent encompasses many pathological processes including neoplastic, infectious, and vascular. The most common malignant neoplasm in this location is lymphoma although rarely primary or metastatic solid tumors may present in the axilla. Benign tumors, such as lipomas and other vascular or lymphatic malformations may also occur [8]. Infections are a common cause of axillary lymphadenopathy, and can be due to a wide variety of agents. The first imaging modality often used for investigation of an axillary mass is ultrasonography, which is helpful to distinguish between vascular and avascular lesions, and between solid and cystic masses. Unless there is concern about malignancy, most axillary masses can be initially observed. If the mass increases in size, excisional or core needle biopsy should be done. In our case, the correct diagnosis was not suspected on imaging, and excision of the mass with pathological evaluation was necessary. Since ectopic breast tissue can be present bilaterally and may not be apparent without a mass, it is recommended that children with a fibroadenoma should be monitored for development of additional masses indefinitely.

3. Conclusion

This case demonstrates that fibroadenoma within ectopic breast tissue should be considered in the differential diagnosis of an axillary mass in children and adolescents, as well as in the adult population.

Conflict of interest statement

All authors have no conflict of interest.

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