

# The Synapse

The Medical Professionals' Network



**THE GREAT  
PRETENDER  
PAGE 6**



**JOB  
OPPORTUNITIES  
PAGE 13**



**INTERVIEW WITH  
EDWARD DE BONO  
PAGE 14**

## Breast Masses in Children - Part II

by **Pierre Vassallo**  
MD PhD FACA Arzt für Radiologie  
Consultant Radiologist

*Discovery of breast masses in children and adolescents often causes tremendous parental and physician concern because of the high prevalence of breast cancer in the adult population.*

*However, the prevalence of breast cancer in this age group is low, and knowledge of the spectrum of pathologic conditions and radiological findings that affect the pediatric breast is important in guiding management...*

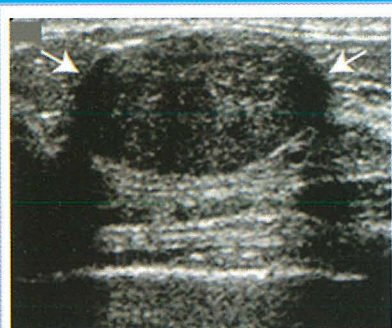
### Benign Breast Tumours

Fibroadenomas are benign fibroepithelial tumors and are the most common breast masses in girls younger than 20 years of age. The mean patient age at diagnosis is 15–17 years. Most patients present with a slowly enlarging, painless mass that may cause breast asymmetry. At physical examination, the mass is well circumscribed, rubbery, and freely movable; it is most often located in the upper outer quadrant. Fibroadenomas are oestrogen-sensitive and may grow faster during pregnancy, although they usually do not vary in size during the menstrual cycle. Fibroadenomas in males have been reported but are rare because males have no terminal duct-lobular units.

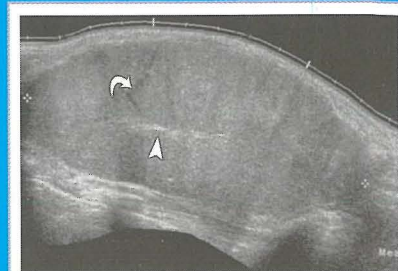
The main consideration in the differential diagnosis of fibroadenoma is phyllodes tumor, a fibroepithelial neoplasm that may be malignant. The histopathologic and imaging features of the cellular subtype of fibroadenoma known as juvenile fibroadenoma and phyllodes tumor overlap considerably, such that they are indistinguishable at imaging. The finding of peripheral cysts at ultrasound suggests phyllodes tumor, but definitive diagnosis requires tissue sampling. Rate of growth is also an important distinguishing factor between fibroadenomas and phyllodes tumours. However benign phyllodes tumours grow slowly like fibroadenomas, while juvenile fibroadenomas show rapid growth as do malignant phyllodes tumours.

The term giant fibroadenoma refers to a fibroadenoma 5-10cm in diameter and most of these entities are juvenile fibroadenomas.

Ultrasound is very sensitive in the detection of fibroadenomas. The typical sonographic appearance of a fibroadenoma is a well-circumscribed, round, oval (Figure 1), or macrolobulated mass with fairly uniform



**Figure 1.** Fibroadenoma seen on ultrasound as a well circumscribed, hypoechoic nodule with dorsal enhancement and a long axis parallel to the chest wall.

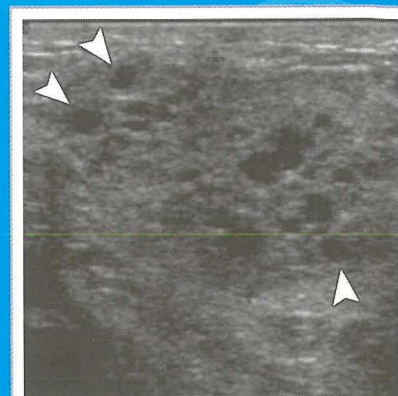


**Figure 2.** A juvenile fibroadenoma seen on ultrasound as a well circumscribed, homogeneously hypoechoic mass (straight arrow) within the fibroglandular breast tissue (\*), with the pectoralis muscle deep to the mass (curved arrow).

hypoechoogenicity. These masses may appear almost anechoic with low-level internal echoes. Slender, fluid-filled clefts may be seen within juvenile fibroadenomas (Figure 2). In ovoid lesions, the growth pattern is horizontal or parallel; that is, the long axis of the mass is parallel to the chest wall. During a colour Doppler evaluation, these lesions may appear avascular or may demonstrate some central vascularity.

Juvenile papillomatosis is a localized, proliferative disorder of young women and older adolescents. Patients present with a firm, well-defined, mobile mass in the periphery of the breast and without nipple discharge. The resected mass appears well circumscribed and contains multiple small cysts (<2 cm) within a dense fibrous stroma, an appearance that has given rise to the term *swiss cheese disease*. This appearance is also evident on ultrasound (Figure 3).

Other causes of masses include infection, trauma, and cyst formation.



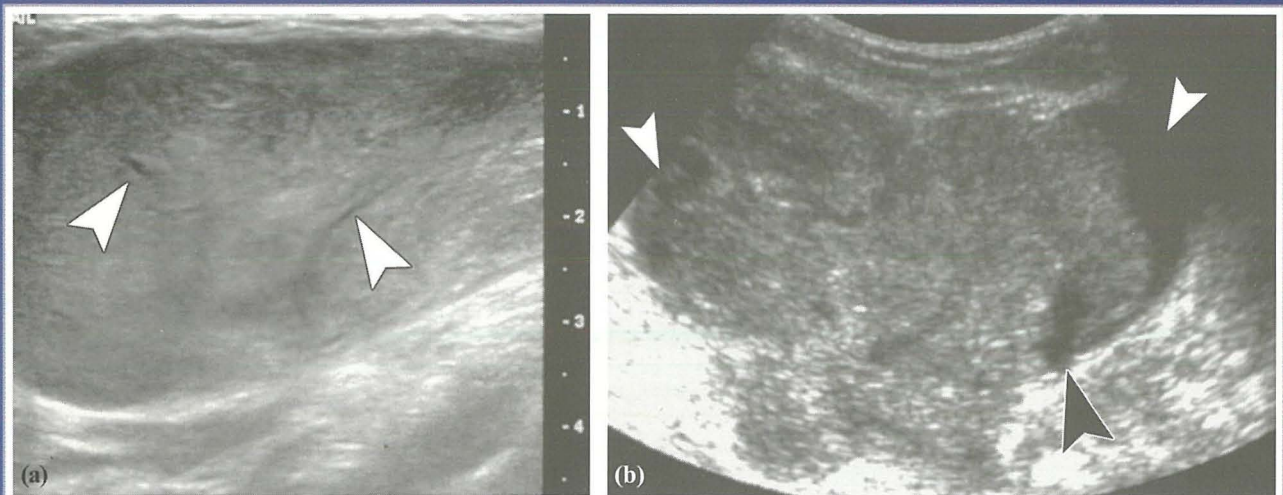
**Figure 3.** Juvenile papillomatosis appears as a slightly hypoechoic mass that contains multiple, small anechoic cysts (arrowheads) on ultrasound.

### Malignant Breast Lesions

Phyllodes tumor, or cystosarcoma phyllodes, is a rare fibroepithelial neoplasm that accounts for only 1% of breast lesions in children and adolescents,

*continues on page 22*

# Breast Masses in Children - Part II



**Figure 4.** (a) Ultrasound scan of a benign phyllodes tumour reveals a fairly homogeneously hypoechoic, sharply circumscribed mass with dorsal enhancement and anechoic linear clefts (arrowheads). These findings are similar to the appearance of a juvenile fibroadenoma. (b) Ultrasound scan of a malignant phyllodes tumor reveals a partially circumscribed hypoechoic mass with posterior sound enhancement and anechoic foci (arrowheads), some of which are round and others are curvilinear.

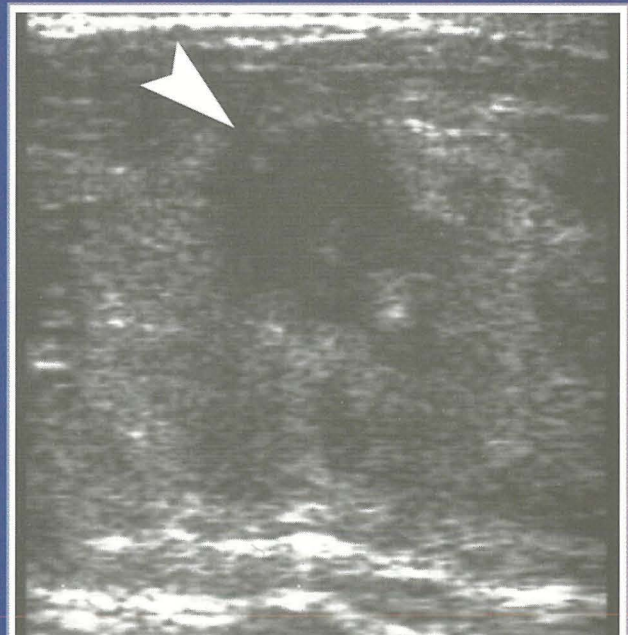
but it is the most common primary mammary malignancy in this age group. Its peak age of prevalence is in the 4th decade of life, but about 5% of phyllodes tumors occur in girls younger than 20 years of age. Phyllodes tumor shares many clinical, pathologic, and imaging features with juvenile fibroadenoma. Phyllodes tumors demonstrate a wide spectrum of biologic behavior, and some have the potential for invasive growth, recurrence, or metastasis in rare cases. Most phyllodes tumors in adolescents are histologically benign; on ultrasound these show smooth margins, have a moderately hypoechoic texture and contain linear clefts (Figure 4a) as do fibroadenomas. The findings of foci of hemorrhage or necrosis suggest malignancy (Figure 4b).

Breast cancer is exceedingly rare in children. The age-adjusted incidence of carcinoma in 2004 was 0.03 cases per 100,000 in patients younger than 20 years of age. On ultrasound, carcinoma typically appears as a hypoechoic mass with irregular margins, inhomogeneous internal echoes, a long axis perpendicular to the chest wall, and variable posterior acoustic shadowing; these features are similar to those seen in an adult (Figure 5).

Metastatic disease and haematologic malignancy are the most prevalent malignant tumors of the breast in children and adolescents, most commonly rhabdomyosarcoma, neuroblastoma, and haematolymphoid malignancies. The sonographic appearances of breast metastases are variable, but most demonstrate lobulated or irregular margins and heterogeneous, hypoechoic internal echotexture with hyperechoic foci. Posterior acoustic shadowing or lack of dorsal enhancement is typically seen. Metastatic disease to the breast is frequently multifocal.

## Summary

The vast majority of conditions that cause breast masses or breast enlargement in children and adolescents are benign. Bilateral enlargement most commonly occurs because of



**Figure 5.** Secretory breast cancer: Ultrasound scan reveals a hypoechoic mass (arrowhead) with irregular borders and an anti-parallel growth pattern.

normal or abnormal development. These conditions are usually self-limited and do not require therapy, but, occasionally, inappropriate breast development may be a sign of a more serious condition, such as a hormonally active gonadal or adrenal tumor that causes feminisation. After onset of puberty, most cases of breast enlargement arise from benign fibroadenoma in girls and gynecomastia in boys. □

Dr Pierre Vassallo can be reached at the DaVinci Hospital on 21 491 200 or by email on [pvassallo@davincihospital.com.mt](mailto:pvassallo@davincihospital.com.mt)