Breast cysts in adolescents – diagnostics, monitoring, treatment

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Summary

Background: The aim of the paper was the US evaluation of hormonal disorders and treatment results in adolescent girls and boys with breast cysts.

Material/Methods: In the years 2001–2009, US examination of the breast was performed in 427 children aged 10–18 years, with clinically suspected breast pathologies. The indications for US examination typically included pain, breast swelling and a palpable tumor. The US examination was performed using a 7–12 MHz linear transducer.

Results: Breast cysts were found in 42 children: 36 adolescent girls and 6 boys with gynecomastia. Infected cysts were found in 35 children. The cysts ranged in size from 5 mm to 30 mm. In 5 of the girls, large cysts were treated by an incision and drainage, and in all the children with infected cysts, antibiotic therapy was used. Hormonal disorders were found in 30 girls. A follow-up examination was performed, and the observation time varied from 1/12 to 2 years. The cysts disappeared completely in 30 children. Hormonal therapy was introduced in 5 girls.

Conclusions: Breast cysts found in US examinations are indications for check-up examinations including endocrinological diagnostics and, if the cyst is persistent, possibly for hormonal treatment.

Key words: breasts • cyst • ultrasound

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Background

Breast cysts are the most common in women over 35 years, being one of the symptoms of dysplastic lesions or hormonal balance disorders. However, they are also found in adolescent girls. They constitute a frequent comorbidity in girls with menstrual disturbances and in boys with gynecomastia. The most common indication for ultrasound examination is here: pain, symptoms of inflammation, and a palpable abnormal mass in the breast. Cysts constitute a clinical problem and require evaluation of coexisting hormonal disturbances.

Material and Methods

US examinations of the breasts were performed with a linear, broadband high-frequency transducer, with the use of power Doppler and colour-coded Doppler ultrasonography. US examinations of the organs of the small pelvis were performed as well (i.e. uterus and ovaries in girls, and testicles in boys), along with hormonal laboratory tests and, in some selected cases, test of tumour marker levels. The time of clinical observation and ultrasound check-up studies ranged from 3 months to 2 years.

In the years 2001–2009, US examinations of the breasts were carried out in 427 children aged 10–18 years, with a clinical suspicion of breast pathology. The group included 311 girls and 116 boys.

Results

Forty-eight adolescent children were referred for breast US in order to have the inflammatory lesions excluded. Most often, the patients were referred for breast US from a surgical emergency unit. Referral indications included pain, breast swelling, and a palpable painful nodule.
On US, breast cysts were found in 42 children, including 36 girls aged 10–18 years. The age of children with breast cysts was presented in Table 1. These were girls (26) aged between 13 and 14 years, and boys, with gynaecomastia (6), aged between 12 and 14 years. Inflamed breast cysts were found on US in 35 children (31 girls and 4 boys) – cyst size ranging from 3 to 30 mm (a maximum size shown in Table 2).

Asymptomatic, noninfected breast cysts were found in 7 children: 6 girls with menstrual disturbances, short height, painless nodule of the breast, effusion from the breast, and one boy with gynaecomastia.

Bilateral breast cysts were found in 83% of children, including 30 out of 36 girls and 5 out of 6 boys. Unilateral cysts were revealed in 6 girls and 1 boy.

In 6 girls, there was an inflammatory infiltration and breast abscesses other than cysts in 4 girls.

In all children with infected cysts, antibiotics were introduced. In 5 girls, large inflamed cysts (2–3 cm in diameter) were treated with incision and draining. Thirty-five children were referred to the endocrinology clinic, for further diagnostics and treatment. Hormonal endocrinological tests were performed in 30 girls and 5 boys. In all 30 girls with infected breast cysts, there were menstrual disturbances.

The hormonal tests of children showed: in girls – luteal atelectasis (26), elevated prolactin level (4), and in boys with breast cysts and gynaecomastia – higher prolactin level (3; including one after prolactinoma).

Follow-up breast examinations were performed in all 42 children with breast cysts – observation time ranged from 1 month to 2 years from the first examination (Table 3).

Cystic lesions subsided in 30 children: in 13 cases within 6 months – 1 year, and in 5 (girls) after 2 years.

The time of lesion disappearance was presented in Table 4. Recurrence of the cyst was found in 5 girls and of the inflammation in 4 girls.

Medicines reducing prolactin level were used in 4 children. Hormonal therapy (progesterone) was introduced in 5 girls with persistent breast cysts, menstrual disorders, and luteal atelectasis.

**Discussion**

Ultrasound together with evaluation of vascularisation in Doppler option is the best method in the diagnostics and imaging of breast cysts, differentiation between simple cysts, complicated cysts, cystic-solid lesions and solid focal lesions [1–4]. Breast cysts are the most commonly found in women aged between 35 and 50 years. The lesions are usually bilateral, in the form of multiple cystic structures – one of the symptoms of dysplastic lesions. Much less common are breast cysts in individuals aged under 25 years [1,2].

Simple cysts produce a typical sonographic image: smooth outline, thin walls, homogeneous enhancement of the ultrasound signal behind the cyst. Inside the cyst, there may be septa, 1–2 mm thick.
Typical symptoms of complicated cysts found on US include the complete or partial thickening of the cystic walls and the presence of tissue lesions within the cyst. Every complicated cyst requires further diagnostics for differentiation with benign and malignant tumours [1–4].

Galactoceles are formed during lactation, out of a widened milk duct in milk outflow disturbances [1]. US shows a focal lesion of cystic type, with an anechoic or echogenic (dense) content – wide milk ducts are mostly seen. This lesion should be differentiated with inflammatory lesions in the cysts, an abscess, or a tumour, which is an indication for FNAB [1,4].

Breast cysts in young women and adolescents are much more seldom than in womanhood (women aged over 35 years) [1].

Ultrasonography is the examination of choice in the diagnostics of breasts in children and adolescents. The most common indication for breast US in this age group, is: their premature development, considerable asymmetry, enlargement in boys, inflammation, pain, effusion, palpable abnormal mass lesion [5–8].

In the group of 427 adolescent children (aged from 10 to 18 years) examined due to a clinical suspicion of different breast pathologies or some selected hormonal disorders, breast cysts were found in 9.8% of children (42 out of 427), which constitutes a significant clinical and diagnostic problem.

US image of infected cysts was typical [5,9,10]. Within a palpable, painful nodule, there was a round or oval mass with a distinct capsule, fluid-like echogenic content, posterior enhancement and increased vascular flow in its region (Figures 1–4). In larger cysts, 2–3 cm in diameter, the fluid level was mostly visible (Figures 2, 3). Most often, the second breast included an asymptomatic cyst or complex of noninfected cysts with a typical nonechogenic content and no increased vascular flow around the cyst (Figures 3, 4).

In all children with inflamed cysts, antibiotics were used. In case of persistent breast cysts, after antibiotic therapy, it is indicated to carry out a check-up US examination of the breast and to refer the patient to endocrinologist, for further diagnostics – including US examinations of the uterus and ovaries, hormone profile of the menstrual cycle, and tumour markers.

Out of 30 girls referred to endocrinology clinic, 29 were diagnosed (in the course of hormonal tests) with a relative disproportion of estrogens with respect to progesterone in the II phase of the menstrual cycle and luteal atelectasis. Four children were diagnosed with an increased prolactin level. The cause of breast cyst formation is not fully understood. It is believed that the relative disproportion between
the level of estrogens and progesterone plays a role in here. The level of estrogens tends to be normal, but there usually is a deficiency of progesterone in the II part of the cycle, which is frequently a result of luteal atelectasis. The relative surplus of estrogens leads to proliferation of epithelial and interstitial cells of the connective tissue and of tissues of the milk ducts. As a result of clogging and accumulation of the effusions, the cysts are formed [5,6].

It may appear effective to reduce poultry and soya in the diet (estrogens and fitoestrogens) and to use herbal medicines (reducing menstrual stress and functional hyperprolactinemia). In case of an elevated prolactin level, it is indicated to carry out hormonal tests and MRI of the hypothalamus and pituitary gland, or, potentially, to introduce pharmacotherapy or surgery.

Persistent (for longer than 6 months) or recurrent breast cysts, with low progesterone levels, constitute an indication for hormonal treatment. In 5 examined girls, hormonal therapy (progesterone) was introduced for persistent breast cysts, menstruation disorders, and luteal atelectasis.
Conclusions

1. US is the examination of choice in breast diagnostics in children and adolescents – it allows for an exclusion or confirmation of an abnormal tissue structure, and determination of its type (node/cyst).

2. Persistent breast cysts in girls with menstrual cycle disturbances and in boys with gynaecomastia are an indication for US examination of the organs of the small pelvis, testicles, and hormonal diagnostics.

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