

СТУДИЈА НА СЛУЧАЈ

ДВА СЛУЧАЈА НА НЕСИНДРОМСКА
КОНГЕНИТАЛНА УНИЛАТЕРАЛНА
ХИПОПЛАЗИЈА ВО ЕДНА ФАМИЛИЈА

Марина Крстевска-Константинова¹, Констандина Кузевска-Манева¹, Елена Шукарова-Ангеловска¹, Ана Стаматова¹, Велибор Тасиќ¹, Зоран Гучев¹, Јулија Хефел²

¹ Универзитетска клиника за Детски болести, Скопје, Република Северна Македонија

² Институт за хумана Генетика, Технички Универзитет, Минхен, Германија

Цитирање: Крстевска-Константинова М, Кузевска-Манева К, Шукарова-Ангеловска Е, Стаматова А, Тасиќ В, Гучев З, Хефел Ј. Два случаја на несиндромска конгенитална унилатерална хипоплазија во една фамилија. *Арх Ј Здравје* 2020;12(1):58-61

Клучни зборови: хипоплазија на дојки, пубертетски аномалии, микромастија

***Кореспонденција:** Марина Крстевска-Константинова - Универзитетска клиника за Детски болести, Скопје, Република Северна Македонија. E-mail: mkrstevskakonstantinova@yahoo.com

Примено: 26-окт-2019; **Ревидирано:** 28-дек-2019; **Прифатено:** 30-дек-2019; **Објавено:** 15-јан-2020

Печатарски права: © 2020 Марина Крстевска-Константинова - Оваа статија е со отворен пристап дистрибуирана под условите на нелицензирана лиценца, која овозможува неограничена употреба, дистрибуција и репродукција на било кој медиум, доколку се цитираат оригиналниот(ите) автор(и) и изворот.

Конкурентски интереси: Авторот изјавува дека нема конкурентски интереси.

Извадок

Микромастија или хипоплазија на дојки е опишана како недоразвиеност на ткивото на дојката кај жените. Опишавме случај на 15-годишно девојче со унилатерална микромастија со фамилијарна предиспозиција. Беа направени ехосонографски, хормонални, дисморфични, кардиолошки и генетски испитувања и тестови. Не беше пронајдена мутација на целокупниот секвенциониран ексом, ниту пак нова мутација. Некои од овие случаи се прикажани како да се поврзани со канцер на дојката и затоа се потребни понатамошни задолжителни следења. Терапијата се состои од хируршка реконструкција на афектираната дојка. Ова претставува ретка состојба, но бара мултидисциплинарен пристап.

CASE STUDY

TWO CASES OF NON-SYNDROMIC CONGENITAL UNILATERAL
BREAST HYPOPLASIA IN ONE FAMILY

Marina Krstevska-Konstantinova¹, Konstandina Kuzevska-Maneva¹, Elena Sukarova-Angelovska¹, Ana Stamatova¹, Velibor Tasic¹, Zoran Gucev¹, Julia Höfele²

¹ University Children's Hospital Skopje, N. Macedonia

² Institute for Human Genetics, Technical University of Munich, Germany

Abstract

Citation: Krstevska-Konstantinova M, Kuzevska-Maneva K, Sukarova-Angelovska E, Stamatova A, Tasic V, Gucev Z, Höfele J. Two cases of Non-Syndromic Congenital Unilateral Breast Hypoplasia in one Family. *Arch Pub Health* 2020; 13(1): 58-61 (English)

Key words: breast hypoplasia, pubertal abnormalities, micromastia

***Correspondence:** Marina Krstevska-Konstantinova, University Children's Hospital, Skopje, North Macedonia. E-mail: mkrstevskakonstantinova@yahoo.com

Received: 26-Oct-2019; **Revised:** 28-Dec-2019; **Accepted:** 30-Dec-2019; **Published:** 15-Jan-2020

Copyright: © 2020. Marina Krstevska-Konstantinova. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

Competing Interests: The author have declared that no competing interests

Micromastia or breast hypoplasia is described as underdevelopment of a woman's mammary tissue. We present the case of a 15-year-old girl with unilateral micromastia, with familial predisposition. Ultrasound, hormonal, dysmorphic, cardiologic, genetic examinations and testing were performed. No mutation in the whole-exome sequencing was found, nor novel mutation. Some of these cases have been reported to be related to breast cancer so further follow-up is mandatory. Therapy consists of surgical reconstruction of the affected breast. This is a rare condition and it requires a multidisciplinary approach.

Introduction

Micromastia or breast hypoplasia is a condition which is described as postpubertal underdevelopment of a woman's mammary tissue. Breast hypoplasia may be congenital or acquired. The defect can be isolated or associated with other pathology, including syndromes and chest wall anomalies; it can also be unilateral or bilateral. Bilateral breast hypoplasia may be either symmetric or asymmetric. Histologically, both unilateral and bilateral hypoplastic breast tissue consists of fibrous stroma and ductal structures without differentiation¹. Many authors have recommended that treatment be performed until breast development is complete (Tanner stage 5), with a stable adult weight and breast volume for one year^{2,3}. Breast hypoplasia carries a psychological aspect almost always in young girls, so they may have low self-esteem, social anxiety, shame, depression⁴ etc. Thus, it has to be dealt with caution, empathy and counseling, besides establishing a diagnosis. Unilateral congenital breast hypoplasia is a rare anomaly of breast development, which incidence is unclear.

Case report

We present a 15-year-old girl, referred to the Pediatric Endocrinology Department of the University Children's Hospital, by the child's family doctor, due to micromastia of the left breast. She had no history of prior illness and the pregnancy of the mother was uneventful, without any given medication or a history of infection. The delivery, neonatal and postnatal period was normal. At examination, pubertal Tanner stage was B5 right breast, B2 left breast, pubic hair P5, axillary hair A5⁴. She had her menstrual cycle at the age of 13, being regular. Her height was on the 50th percentile growth curve, while her weight was on the 75th percentile⁵. The patient was otherwise healthy, without any other deformities or anomalies. From the family history her maternal grandmother had the same condition, which was never examined or treated. She is now 70-year-old without any present breast pathology. The patient's mother had also one smaller breast, although not significantly. The ultrasound of the breast showed hypoplasia of the mammary tissue on the left breast, while the other breast was normally developed without any pathological finding. Hormonal analysis was normal (estrogen, progesterone and gonadotropins levels). The ultrasound of the gonads was also normal and corresponded to her age (Picture No 1).



Pict. No 1. Unilateral breast hypoplasia in 15-old-year girl

Mammography was not performed at the first visit, but it was planned for on the future visit. Due to the finding of the heart murmur, she was examined by a

pediatric cardiologist, who found a mitral valve prolapse of minor significance.

A whole-exome sequencing was performed at the Genetics Department, Technical University, Munich, Germany, and it did not show any mutations of the genes most commonly associated with this condition or any novel mutation. The most common syndromic causes for congenital breast hypoplasia, Poland's and Turner's syndromes, were excluded.

Discussion

Rudimentary mammary ducts are found beneath the nipple in infancy and they grow and branch slowly during the prepubertal years. Estrogen stimulates the nipples to grow and progress to the stage at which ductules are formed, and fatty stromal growth to increase until it constitutes most of the mass of the breast. Hormones interact with breast stroma and local growth factors to stimulate the development of breast epithelium⁶. Breast development normally occurs in girls between ages of 8 and 13 years. The rate of breast varies and development is often asymmetric. Complete development may not occur until a woman is in her early 20s.

Breast hypoplasia or micromastia represents a rare condition in pediatric and adolescent patients associated with some syndromes and chest wall abnormalities.

According to some authors, breast abnormalities can be categorized into 3 groups, including hypoplastic, hyperplastic and deformational anomalies⁷. Another author introduces a new classification based on asymmetry of breast. He proposes 4 main malformative asymmetry of breast: precocious primary groups with 3 subgroups, which are the asymmetry of breasts, secondary acquired, and tertiary-induced breast asymmetry⁸.

Syndroms are also associated with hypoplastic breasts such as Poland's syndrome, characterized by unilateral aplasia of the major pectoral muscle, thoracic and upper limb anomalies, often with unilateral breast hypoplasia on the same side⁹.

Turner's syndrome is a result of chromosomal abnormalities and presents with specific clinical features, short

stature, hypogonadism, absence of puberty and sexual development, and even some forms have scarce mammary tissue (depending on cariotype)¹⁰. Some authors have suggested that congenital unilateral hypoplasia of the breast may be caused by underexpression of the estrogen receptor in the breast and other expression in hypertrophy¹¹. Estrogen and progesterone play a role in breast development, and also in breast cancer susceptibility. The BRCA1 gene normally restrains mammary growth by inhibiting expression of estrogen receptor ERα and PRs and cancer-related mutation reverse these processes¹².

Few gene mutations have been implicated as the most common culprits causative of the nonsyndromic cases. Inherited autosomal variants are studied in genome-wide association variants that can play a role. Three genetic phenomena can induce risk in maternal versus paternal lineages of affected individuals: maternal effects on prenatal development, mitochondrial variants, and autosomal genes¹³. Other authors implicate the risk of asymmetry is associated with elevated breast cancer risk^{15, 14, 15}.

Coordination between pediatricians and pediatric plastic surgeons and careful timing for treatment to maximize functional and aesthetic outcomes have been proposed⁶. Different surgical procedures have been proposed such as using autologous fat grafting¹⁶, and a more recent procedure is the use of lipofilling¹⁷. Otherwise, it is on the plastic surgeon to decide which technique to choose. In consultation with both the patient and the parents we decided that plastic surgery should be performed at the girl's appropriate age.

Conclusion

A rare case of unilateral breast hypoplasia is presented. Although, many investigations regarding this condition have been performed, the etiology still remains unknown. In our case, it indicated a familial form of the anomaly, although the genetic testing was negative. The treatment will be a surgical reconstruction of the affected breast after the

child reaches a certain age. We also recommend future follow-up of the patient, due to a potential risk of breast cancer.

References

1. Rosen P. Abnormalities of mammary growth and development. Philadelphia, PA; Lippincott Williams and Wilkins; 2009pp.23-27
2. Oakes MN, Quint EH, Smith YR, Cederna PS. Early staged reconstruction in young women with severe breast asymmetry. *J Pediatr Adolesc Gynecol* 2009;22(4):223-228
3. Caonette-Laberge L, Bortoluzzi PA. Correction of breast asymmetry in teenagers. Philadelphia PA; Saunders; 2010. 601-630
4. Wincour S, Lemaine V. Hypoplastic breast anomalies in the female adolescent breast. *Semin Plast Surg* 2013; 27(1):42-48
5. Tanner SM, Whitehouse RH. Clinical longitudinal standards for height, weight,height velocity, weight velocity, and stages of puberty. *Arch Dis Child* 1976;51(3):170-9
6. Mark A Sperling. *Pediatric Endocrinology*, third edition. Saunders Elsevier, 2008 pp 557-558
7. Van Aalst JA, Phillips JD, Sadove AM. Pediatric chest wall and breast deformities. *Plast Reconstr Surg* 2009;124 (1 Suppl):38e-49e
8. Vandebussche F. Asymmetries of the breast: a classification system. *Aesthetic Plast Surg* 1984;8(1):27-36
9. Geeroms B, Braysem L, Aertsen M. An atypical case of Poland Syndrome with bilateral features and dextroposition of the heart: In the work-up of Poland syndrome, different imaging modalities are necessary to depict the full extent of the anomalies. *J Belg Soc Radiol* 2019;103(1):45
10. Ucar A, Wong JSC, Darendalier S, Holly MP, Levoith D. Editorial: Hot Topics of Debate on Turner Syndrome: Growth, Puberty, Cardiovascular risks, Fertility and Psychosocial development. *Front Endocrinol (Lansanne)* 2019 Ser 19;10:644
11. Sun J, Qiao Q, Qi K. The difference in estrogen receptor protein level between breast hypertrophy and micromastia. *Plast Reconstr Surg* 2004;113(7):2241-2
12. Ma Y, Katiyar P, Jones LP, et al. The breast cancer susceptibility gene BRCA1 regulates progesterone receptor signaling in mammary epithelial cells. *Mol Endocrinol* 2006; 20(1):14-34
13. Weinberg CR, Shi M, DeRoo LA, Taylor JA, Sandler DP, Umbach DM. Asymmetry in family history implicates nonstandard genetic mechanisms: application to the genetics of breast cancer. *PLoS Genet* 2014 20;10(3):e1004174
14. Scutt D, Lancaster GA, Manning JT. Breast asymmetry and predisposition to breast cancer. *Breast Cancer Res* 2006;8(2):R14
15. Scutt D, Manning JT, Whitehouse GH, Leinster SJ, Massey CP. The relationship between breast asymmetry, breast size and the occurrence of breast cancer. *Br J Radiol* 1997;70(838):1017-21
16. Klit A, Siemssen PA, Gramkow CS. Treatment of congenital unilateral hypoplastic breast anomalies using autologous fat grafting: A study of 11 consecutive patients. *J Plast Reconstr Aesthet Surg* 2015;68(8):1106-11
17. Derder M, Whitaker IS, Boudana D, et al. The use of lipofilling to treat congenital hypoplastic breast anomalies: preliminary experiences. *Ann Plast Surg* 2014;73(4):371-7