UCSF

UC San Francisco Previously Published Works

Title

Early onset, multiple, bilateral fibroadenomas of the breast: a case report.

Permalink

<https://escholarship.org/uc/item/22r4d4n6>

Journal

BMC women's health, 21(1)

ISSN

1472-6874

Authors

Im, Cecilia J
Miller, Ashlie
Balassanian, Ronald
et al.

Publication Date

2021-04-01

DOI

10.1186/s12905-021-01311-7

Peer reviewed

CASE REPORT

Open Access

Early onset, multiple, bilateral fibroadenomas of the breast: a case report

Cecilia J. Im^{1*} , Ashlie Miller², Ronald Balassanian³ and Rita A. Mukhtar⁴

Abstract

Background: While fibroadenomas are common in the general population, affecting 10–20% of women, they are rarely early-onset, multiple, and bilateral.

Case presentation: An 18-year-old woman presented with a 6 year history of multiple, bilateral breast masses without family history of breast disease. Magnetic resonance imaging (MRI, Fig. 1) of the breasts showed innumerable, bilateral breast masses ranging in size from 0.5 to 4 cm. Two needle biopsies showed fibroadenoma. Although the patient's family history did not meet National Comprehensive Cancer Network (NCCN) guidelines for genetic testing, it was performed due to the rarity of her presentation. Genetic testing identified a pathogenic mutation in the phosphatase and tensin homolog (*PTEN*) gene.

Conclusions: A germline mutation in *PTEN* is associated with an increased risk of breast cancer and often occurs as part of Cowden Syndrome. This case highlights the importance of genetic testing in patients with unusual presentations of early-onset, bilateral, and multiple (greater than four) fibroadenomas.

Keywords: *PTEN*, Fibroadenoma, Genetic testing, Case report

Background

The *PTEN* protein acts as an antagonist to the P13k/Akt pathway. Insufficient suppression in the setting of a *PTEN* mutation leads to increased cell proliferation with decreased apoptosis [1]. *PTEN* hamartoma tumor syndrome is a family of clinical syndromes characterized by germline mutations in the *PTEN* gene [2]. The best characterized of these is Cowden Syndrome which is associated with increased lifetime cumulative risk of developing cancer in the breast (67–85%), thyroid (35%), kidney (33%), and endometrium (28%) [3]. Additionally, benign breast disease is common in Cowden syndrome, with fibroadenomas found in approximately 35% of *PTEN* mutation carriers. These fibroadenomas are more likely to be complex and hyalinize at an early age [4].

While fibroadenomas are common in the general population, affecting 10–20% of women, they are rarely multiple and bilateral [5]. Among women with fibroadenomas, only 15% have 2–4 masses in one breast and only 11% have bilateral masses [6]. Additionally, fibroadenomas in adolescents are rare, found in just 0.5 to 4% of patients [7]. The reported data regarding women with bilateral and multiple fibroadenomas is currently limited to less than 20 case reviews without genetic data. Only one other case report characterizes an adolescent with bilateral and more than 4 masses but this study lacks genetic data [8].

Current NCCN guidelines state that major criteria for genetic testing for *PTEN* hamartoma tumor syndrome include breast, endometrial, or follicular thyroid cancer, multiple gastrointestinal hamartomas, macrocephaly, and the presence of mucocutaneous lesions including trichilemmoma, palmoplantar keratoses, or extensive oral mucosal papillomatosis [9]. This case report provides

*Correspondence: Cecilia.Im@ucsf.edu

¹ School of Medicine, University of California San Francisco, San Francisco, CA, USA

Full list of author information is available at the end of the article

© The Author(s) 2021. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

Fig. 3 Fine needle aspiration with papanicolaou stain, x20. The aspirates were paucicellular and revealed staghorn shaped cohesive clusters of benign ductal cells. Myoepithelial cells were present in association with the ductal clusters and as bare bipolar cells in the background (a). Rare fragments of dense sclerotic stroma were present (b)

genetic testing for all patients with numerous and bilateral fibroadenomas. The frequency of genetic mutations in these patients is currently unknown, highlighting the importance of genetic testing in patients with unusual presentations of fibroadenomas.

Abbreviations

MRI: Magnetic resonance imaging; NCCN: National Comprehensive Cancer Network; PTEN: Phosphatase and tensin homolog.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12905-021-01311-7>.

Additional file 1. Custom 100 Gene Hereditary Cancer Panel

Acknowledgements

We would like to thank Dr. Yunn-Yi Chen for lending her expertise.

Authors' contributions

CJI and RAM were involved in manuscript creation, writing, and editing. AM and RB were major contributors to writing and editing. All authors read and approved the manuscript.

Funding

The authors have no funding sources to declare.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Declarations

Ethics approval and consent to participate

Patient consent was obtained and this report is considered exempt from review by the UCSF Institutional Review Board.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Competing interests

The authors declare that they have no competing interests.

Author details

¹School of Medicine, University of California San Francisco, San Francisco, CA, USA. ²Department of Cancer Genetics, University of California San Francisco, San Francisco, CA, USA. ³Department of Pathology, University of California San Francisco, San Francisco, CA, USA. ⁴Department of Surgery, Division of Surgical Oncology, University of California San Francisco, San Francisco, CA, USA.

Received: 1 December 2020 Accepted: 15 April 2021

Published online: 21 April 2021

References

1. Lee Y-R, Chen M, Pandolfi PP. The functions and regulation of the PTEN tumour suppressor: new modes and prospects. *Nat Rev Mol Cell Biol.* 2018;19(9):547–62.
2. Bubien V, Bonnet F, Brouste V, Hoppe S, Barouk-Simonet E, David A, et al. High cumulative risks of cancer in patients with PTEN hamartoma tumour syndrome. *J Med Genet.* 2013;50(4):255–63.
3. Tan MH, Mester JL, Ngeow J, Rybicki LA, Orloff MS, Eng C. Lifetime cancer risks in individuals with germline PTEN mutations. *Clin Cancer Res.* 2012;18(2):400–7.
4. Schrager CA, Schneider D, Gruener AC, Tsou HC, Peacocke M. Similarities of cutaneous and breasts pathology in Cowden's Syndrome. *Exp Dermatol.* 1998;7(6):380–90.
5. Panda SK, Patro B, Mishra J, Dora RK, Subudhi BSK. Multiple fibroadenomas in bilateral breasts of a 46-year-old Indian woman—a case report. *2014;5(5):262–4.*
6. Onuigbo W. Breast fibroadenoma in teenage females. *Turk J Pediatr.* 2003;45(4):326–8.
7. Jayasinghe Y, Simmons PS. Fibroadenomas in adolescence. *Curr Opin Obstet Gynecol.* 2009;21(5):402–6.
8. Kaur N, Saini S, Somasekhar S, Gupta A. Bilateral florid juvenile fibroadenomas of the breast in an adolescent: a rare indication for subcutaneous mastectomy. *J Pediatr Adolesc Gynecol.* 2015;28(5):e135–7.

9. Network NCC. Genetic/Familial High-Risk Assessment: Breast, Ovarian, and Pancreatic (Version 1.2020). https://www.nccn.org/professionals/physician_gls/pdf/genetics_bop.pdf.
10. Mester J, Eng C. Estimate of de novo mutation frequency in probands with PTEN hamartoma tumor syndrome. *Genet Med*. 2012;14(9):819–22.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions