

Recurrent intraductal papilloma mimicking secretory breast cancer in a 10-year-old girl—a case report

Michael Co¹, Gavin Chan², John Chan³, Ava Kwong¹

¹Department of Surgery, University of Hong Kong, Hong Kong, China; ²Department of Pathology, Queen Mary Hospital, Hong Kong, China; ³Department of Pathology, Queen Elizabeth Hospital, Hong Kong, China

Correspondence to: Ava Kwong. Department of Surgery, University of Hong Kong, Hong Kong, China. Email: avakwong@hku.hk.

Abstract: Breast masses are not uncommon in otherwise healthy young children. Most of these lesions are benign or due to premature thelarche. Carcinoma of the breasts in children is rare, accounting for less than 1% of all childhood cancers and less than 0.1% of all breast cancers. However, high index of suspicion is still necessary especially when the breast mass increases in size over the time—and biopsy should be considered. Here we present a case of suspicious secretory breast cancer diagnosed by pre-operative core-needle biopsy. That 10-year-old girl presented initially with right nipple discharge, subsequent triple assessment and core-needle biopsy suggested the diagnosis of secretory breast cancer. In view of the rare occurrence of pediatric breast cancer, radical surgery was not performed after detailed discussion with patient's parents. Excisional biopsy was arranged instead and the plan was to proceed with radical cancer surgery only when malignancy is confirmed by excision. Pathology of the excisional biopsy showed intraductal papillary lesion. This case has demonstrated the diagnostic difficulty and ambiguity of pediatric breast lesion. Wide excision (or mastectomy) in pre-pubertal girl is a major undertaking. Prudent pathological re-examination before contemplating radical breast cancer surgery is warranted for any pathological discordance with clinical or radiological features.

Keywords: Case report; pediatric breast cancer; intraduct papilloma; secretory breast cancer

Received: 17 March 2020. Accepted: 19 June 2020.

doi: 10.21037/abs-20-47

View this article at: <http://dx.doi.org/10.21037/abs-20-47>

Introduction

Breast masses are not uncommon in otherwise healthy young children. They are frequently seen in surgical or pediatric clinics and often results in parental anxiety. However, most of these lesions are benign or due to premature thelarche. Carcinoma of the breasts in children is rare, accounting for less than 1% of all childhood cancers and less than 0.1% of all breast cancers (1,2). However, high index of suspicion is still necessary especially when the breast mass increases in size over the time—and biopsy should be considered.

A variety of breast cancer histotypes have been described in young children in the literature, including secretory

carcinoma, intraductal, lobular, medullary and inflammatory carcinomas (2-5). A recent report in January 2020 described a 6-year-old Japanese girl with secretory breast cancer, in which the diagnosis was not established by pre-operative imaging. Pre-operative ultrasound elastography suggested suspicious lesion but secretory breast cancer was diagnosed only when excisional biopsy was performed (4).

Here we report a rare case of pediatric secretory breast cancer diagnosed on pre-operative core needle biopsy, but pathological slide review and subsequent surgical excision of the lesion confirmed the diagnosis of intraductal papilloma without evidence of malignancy. This is a unique report describing the importance of pathological re-examination in pediatric patients diagnosed for breast cancer by core needle

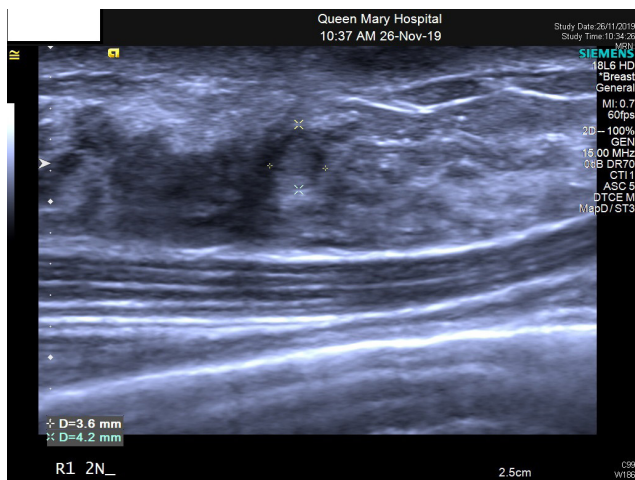


Figure 1 Right breast 1 o'clock position, 2 cm from nipple: deep to the skin scar, a 4 mm ×4 mm ×6 mm cystic lesion with intracystic nodule is seen.

biopsy. Informed consent was taken from patient for clinical data storage and research publication. We present the following article in accordance with the CARE reporting checklist.

Case presentation

Clinical history on the first episode of nipple discharge

This patient was a 10-year-old Hong Kong Chinese girl who first presented with right blood-stained nipple discharge in December 2018. She had unremarkable past health and had no family history of breast or ovarian cancers. Physical examination found a single duct blood stained right nipple discharge. There was no palpable breast lump or axillary lymphadenopathy.

Ultrasound (USG) was arranged after the first clinic consultation and showed dilated ducts with suspicious intraductal papillary lesion in the right breast at 12-1 o'clock. The left breast was normal. USG guided core needle biopsy was performed and found intraductal papillary neoplasm with atypia.

Hookwire-guided excision was performed in January 2019. Pathology showed benign intraductal papilloma without evidence of malignancy or atypia.

Clinical history on recurrent nipple discharge

Patient was then regularly monitored in the breast surgery

clinic. Patient remained well for six months after the excisional biopsy but she returned to our clinic in June 2019 for another episode of right nipple discharge.

Breast imaging and pre-operative histology for recurrent nipple discharge

USG was repeated in June 2019 and found focally dilated duct containing a vascular echogenic lesion (4 mm) just underneath the surgical scar at right breast 1 o'clock position 2 cm from nipple, highly suspicious of intraduct papillary lesion (*Figure 1*). USG-guided core needle biopsy was performed on the same day and showed cores of fibroadipose tissue with small fragments of atypical epithelial proliferation. The scanty lesional cells form complex glandular and tubular patterns. Extracellular pale blue mucinous stroma and pink secretions were noted. The cells had low grade cytologic atypia, eosinophilic cytoplasm, fine chromatin and rather uniform nuclei. Mitotic figure was not found (*Figures 2,3*). The core biopsy had been examined by three independent pathologists, with a discordance in pathological suggestions varying from recurrent intraduct papillary lesion involved by atypical hyperplasia or ductal carcinoma in-situ to secretory carcinoma. Due to the small sample size, the limited number of lesional cells were unfortunately depleted in immunostaining. A definitive diagnosis could not be made.

Excisional biopsy for recurrent nipple discharge

In view of pathological discordance in the core biopsy and an intraductal carcinoma or secretory carcinoma cannot be entirely excluded, patient received a hookwire guided excision in December 2019, 11 months after the first excision. The removed specimen was 2.5 cm ×2 cm ×1 cm in size. Operation was uneventful. Pathology examination found intraductal papillary lesion in several adjacent dilated ducts. There were fibrovascular cores associated with solid proliferation of epithelial cells punctuated by mildly irregular to round luminal spaces. The epithelial cells are polygonal and possess eosinophilic cytoplasm, oval nuclei, fine chromatin and small distinct nucleoli. Mucinous material was observed between the fibrovascular cores and the epithelial cell proliferation. Immunostaining for p63 was able to highlight the focal presence myoepithelial cells in the papillary lesion. The epithelial proliferation retained expression of high molecular weight cytokeratin (CK5/6).

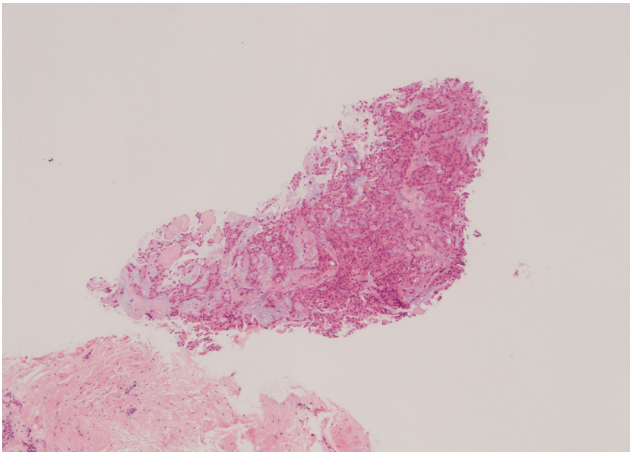


Figure 2 Core biopsy of the breast showed a small fragment of lesional cells displaying atypical epithelial proliferation. These lesional cells form complex glandular and tubular patterns with extracellular pale blue to pink secretions, raising a suggestion of secretory carcinoma (HE, $\times 40$).

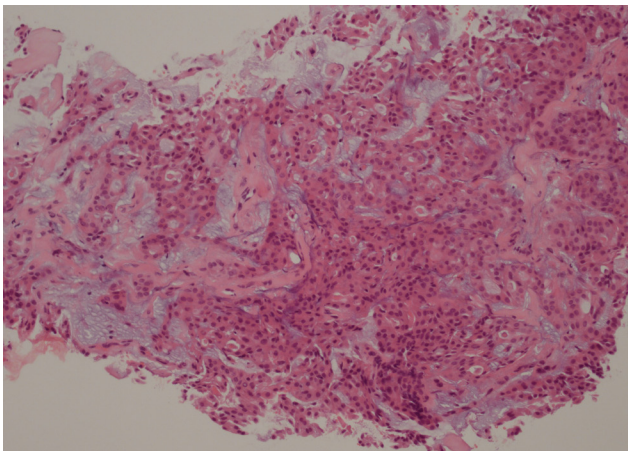


Figure 3 The epithelial cells have low grade cytologic atypia, eosinophilic cytoplasm and fine chromatin. Mitotic figure is not found (HE, $\times 100$).

They exhibited heterogeneous weak to moderate positivity for estrogen receptor. Overall features suggested intraductal papilloma with superimposed epithelial hyperplasia. There was no evidence of in-situ or invasive malignancy. Excision margins were complete.

External expert pathology review and further studies including pan-Trk immunostains and FISH for ETV6 were arranged. The tests were not suggestive of secretory

carcinoma.

Patient was then monitored regularly in the breast surgery clinic with interval surveillance breast imaging. She was last seen in January 2020 and remained asymptomatic.

Discussion

Secretory breast cancer is a rare but distinct subtype of breast carcinoma. It was originally described as juvenile breast cancer in 1966 and has been reported in young children in the literature (6,7). It has a generally favorable prognosis and as its name implies, the classical histopathological features include the presence of abundant intracellular and extracellular eosinophilic secretion that stains positive for periodic acid-Schiff. Most tumors stain positive for S100 and negative for estrogen, progesterone and HER-2 receptors.

Although secretory breast cancer is “commonly” described in pediatric age group, the term juvenile breast cancer described by McDivitt and Stewart is probably a misnomer as subsequent studies have reported secretory carcinoma in adults in 1980 (6,8). Secretory breast cancer has been reported in patients with wide range of ages, from 3 to 86 years old (9,10). Breast cancer in young children is generally rare and accounts for only 1% of all pediatric cancers (1). This case demonstrates the importance of taking clinical context into consideration when interpreting an unusual pathology report. Fine needle aspiration cytology (FNAC) and core needle biopsy are commonly used in adults for obtaining pre-operative diagnosis of breast lesions (11). FNAC and core needle biopsy can be performed in pediatric patients, however due to the invasive nature of the investigation, it is often performed under sedation or even general anesthesia to minimize sampling error by unwanted patient movement or struggling (3). Pre-operative diagnosis with cytology or histopathology allows careful planning of the extent of surgery in dealing with pediatric breast lumps, especially when prepubertal breast tissue should be preserved as much as possible for future normal breast development (11). Unusual diagnosis of breast cancer in a young child like in this case warrants prudent pathology review.

Gohara *et al.* described the use of ultrasound elastography to predict the chance of malignancy in pediatric breast lump (4). Ultrasound elastography has the beauty of being non-invasive, and able to indicate suspicious lesions (4). However, its use is limited by the availability of individual

breast centers.

In view that secretory breast cancer cannot be excluded entirely in initial core biopsy, patient underwent excision of the breast lesion. Detailed histopathological examination of the excised specimen found intraductal proliferation of epithelial cells with relatively bland-looking nuclei. Further pan-Trk immunostains and FISH for ETV6 were not suggestive of secretory carcinoma.

Being a case report, we recognize the inherent weakness of not being able to draw any statistically significant conclusion. However, intraductal papilloma in a pre-pubertal child is extremely rare. This case is also unique that the girl was “mistakenly” labelled as having a secretory breast cancer by pre-operative core needle biopsy. In fact, this case has demonstrated the diagnostic difficulty and ambiguity of pediatric breast lesion. Wide excision (or mastectomy) in pre-pubertal girl is a major undertaking. Patient’s family was satisfied with the decision of not undergoing radical breast cancer surgery immediately after the initial core needle biopsy. We believe prudent pathological re-examination is warranted for any pathological discordance with clinical or radiological features.

Conclusions

We illustrated a case of recurrent intraductal papilloma mimicking secretory breast cancer in a 10-year-old girl. Breast cancer in a prepubertal child is extremely rare, pathological re-examination should be performed whenever in doubt before contemplating radical cancer treatment.

Acknowledgments

Funding: None. (Funding: The study was supported by xxxxxx.)

Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/abs-20-47>). MC serves as an unpaid editorial board member of *Annals of Breast Surgery* from Mar 2019 to Feb 2021. AK serves as an unpaid editorial board member

of *Annals of Breast Surgery* from Sep 2019 to Aug 2021. The authors have no other conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Informed consent was taken from patient for clinical data storage and research publication.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Lee SG, Jung SP, Lee HY, et al. Secretory breast carcinoma: a report of three cases and a review of the literature. *Oncol Lett* 2014;8:683-6.
2. Buchino JJ, Moore GD, Bond SJ. Secretory carcinoma in a 9-year-old girl. *Diagn Cytopathol* 2004;31:430-1.
3. Murphy JJ, Morzaria S, Gow KW, et al. Breast cancer in a 6-year-old child. *J Pediatr Surg* 2000;35:765-7.
4. Gohara T, Komura M, Asano A, et al. A case of secretory breast cancer in a 6 year-old girl: is it possible to make a correct preoperative diagnosis? *Breast Cancer* 2011.
5. Richards MK, Goldin AB, Beierle EA, et al. Breast malignancies in children: presentation, management, and survival. *Ann Surg Oncol* 2017;24:1482-91.
6. McDivitt RW, Stewart FW. Breast carcinoma in children. *JAMA* 1966;195:388-90.
7. Vasudev P, Onuma K. Secretory breast carcinoma: unique, triple-negative carcinoma with a favorable prognosis and characteristic molecular expression. *Arch Pathol Lab Med* 2011;135:1606-10.
8. Tavassoli FA, Norris HJ. Secretory carcinoma of the breast. *Cancer* 1980;45:2404-13.
9. Horowitz DP, Sharma CS, Connolly E, et al. Secretory

- carcinoma of the breast: results from the survival, epidemiology and end results database. *Breast* 2012;21:350-3.
10. Noh WC, Paik NS, Cho KJ, et al. Secretory carcinoma of the breast in three year-old girl: report of a case. *J Korean*

- Breast Cancer Soc* 2000;3:80-4.
11. Kazi M, Parshad R, Seenu V, et al. Fine-needle aspiration cytology (FNAC) in breast cancer: a reappraisal based on retrospective review of 698 cases. *World J Surg* 2017;41:1528-33.

doi: 10.21037/abs-20-47

Cite this article as: Co M, Chan G, Chan J, Kwong A. Recurrent intraductal papilloma mimicking secretory breast cancer in a 10-year-old girl—a case report. *Ann Breast Surg* 2020.